NBSIR 73-407

Report on a Pre-Test of a Survey Plan for Estimating Incidence of Lead Based Paint

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U. S. DEPARTMENT OF COMMERCE, Frederick B. Dent, Secretary

NATIONAL BUREAU OF STANDARDS, Richard W. Roberts, Director

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Contents

Abstract

Lead in paint has been indicted as a major cause of lead poisoning of children. Federal regulations have been established to limit the amount of lead which may be added to paints that are intended for residential use. The intent of such a limitation is to curtail the incidence of present and future lead based paint poisoning of children.

This report presents the results of a "pre-test" for a nation-wide survey plan that would be used to determine the availability, to the public, of paints that may contain lead compounds in hazardous quantities. Statistical summaries of the chemical analysis of 250 paints purchased by random selection at five retail outlets, are presented along with comments regarding the possible implications of those results. Recommendations concerning additional survey action beyond the pre-test are described herein.

Key Words: Lead; lead paint poisoning; paints; poisoning; retail inventory; statistics; survey

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1. Introduction

A primary cause of lead poisoning of children may be the ingestion of lead based paints from walls and other residential surfaces, particularly by children with pica, an aggravated tendency to consume non-food substances.

Concern over the currently determined, and projected future, incidence of lead poisoning resulted in legislation intended to limit the use of lead based paint, in order to prevent its application to surfaces that might be accessible to young children.

The Lead Based Paint Poisoning Prevention Act, PL 91-695, which was signed into law in January 1971, defined lead based paint as that which contains more than 1% lead, by weight, in the total non-volatile solids content of a whole paint.*

In keeping with certain responsibilities imposed on it by PL 91-695, the Department of Housing and Urban Development (HUD) requested the National Bureau of Standards (NBS) to develop a plan for carrying out a survey of lead levels in the nation-wide retail inventory of paints produced for residential use.

The NBS proceeded to fulfill two objectives with regard to the so-called "lead paint survey" assignment. First, a nation-wide purchasing plan was developed and implemented in order to determine the availability of lead based paint to the public via the retail market. Approximately 400 cans of paint were purchased according to a deliberately

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* In 1972 (after the completion of the work described herein) the allowable level was reduced to 1/2% by FDA under authority established by the Hazardous Substances Act.

biased plan which selected those paint colors thought likely to contain lead. The results of that survey were published in an NBS Report in 1972 [1]. Second, a private consulting firm was commissioned to develop a nation-wide sampling plan based upon random selection and sound statistical methodologies. It was originally intended that the consulting firm would develop a selection process for procuring paint samples, and that alternatives would be presented which would indicate trade-offs between the size (cost) of the sample population for a nation-wide survey and the reliability of the conclusions derived from it.

As work progressed on the sampling plan, the complexities of the inventory survey problem became increasingly evident and the objectives of the contract were revised. In brief, the revised contract called for the selection and procurement of 250 paint samples (50 in each of 5 paint retail outlets) which would be analyzed for lead content by NBS. The data resulting from this first "pre-test" could be used to develop the alternatives described above for the nation-wide survey plan. The pre-test had originally been planned primarily for the usual "non-statistical" purposes of establishing information about survey costs, development of data recording procedures, discovering any possible difficulties in the physical execution of the survey plan, etc. The contractor's report [2] contains: (a) estimates of the size of the U.S. retail inventory, number of retail outlets and the number of manufacturers; (b) a discussion of alternatives to the survey target population (retail paints); (c) a detailed analysis of development costs and methods for a sampling plan; and (d) computer simulations of several candidate sampling schemes.

This report summarizes the results of the chemical analyses and presents a brief discussion of the implication of the pre-test results.

2. Methods of Chemical Analysis of Liquid Paints

All of the paints were mechanically shaken in their original, unopened, containers for five minutes immediately prior to the removal of sample quantities for chemical analysis. Four samples were taken from each paint can; two for determining the percent solids (pigments, extenders and non-volatile components) and two for determining the percent lead. Two samples were taken from each spray paint container for determining the percent lead.

The percentage by weight of the solids in each liquid paint was determined by 1) accurately weighing approximately 0.3 gram (gm) of liquid paint into an aluminum weighing dish; 2) adding benzene as a diluent for organic solvent type paints (alkyds, oils, varnish, etc.), water as a diluent for latex paints, in order to spread the sample over the interior of the dish; and 3) placing the sample in a drying oven, set at 150°C, for one hour. The weighing dish containing the dried paint was then air cooled, the sample reweighed, and the percent solids calculated on the basis of weight differences.

The samples that were taken for the analysis of lead content were prepared by accurately weighing approximately one gram of the liquid paint into Vycor crucibles. The samples were dry-ashed in a muffle furnace at 500°C for up to 18 hours (overnight). The samples were

removed from the furnace, allowed to cool to room temperature and then were subjected to wet digestion, while heating on a hot plate, by consecutive 5 milliliter (ml) additions of concentrated nitric and perchloric acids. After 2-3 hours of digestion the samples were quantitatively transferred to 100 ml. volumetric flasks and diluted to volume with distilled water.

All of the paint samples were analyzed immediately after their final dilution by means of routine atomic absorption spectrophotometry techniques and instrumentation. Calibration standards were prepared daily by diluting reagent grade lead acetate solutions, containing 1000 parts per million (ppm) of lead, to appropriately lower concentrations.

The detection limit for lead, using atomic absorption techniques, is 0.1 ppm. A one gram sample of liquid paint, having 50% solids, which contains 1% lead, will result in a concentration of 50 ppm when diluted to 100 ml of solution. Therefore, such a sample contains 500 times the detection limit of the procedure. The accuracy of the analysis of samples having lead concentrations near the detection limit can be increased by taking a larger sample for analysis or by reducing the volume of the final diluted solution.

The tabulated percentage lead contents of the paint are related to the instrument readings as follows:

$$\% \text{ Lead} = \frac{P \times 10^{-6} \times V \times 100}{W \times F}$$

where P is the instrument reading in ppm

V is the (diluted) sample volume in ml, usually about 100 ml

W is the sample weight in grams, usually about 1 gm

F is the sample fraction of nonvolatile solids, which ranged from about .14 to .75 with a median value of about .6

The testing procedure for the sample of 250 cans was specifically aimed at identifying "lead based paints" according to the 1% criterion defined in PL 91-695. (Such paints will be designated LB throughout the remainder of this report.) The measurement procedure was calibrated therefore, to have greatest accuracy for lead content between .5% and 1.5%. Paints with lead contents recorded above this level do contain more than 1.5% lead, but the indicated measurements are not highly reliable, with possible error up to 30% of true values.

Although the mean error, as indicated by differences in the paired sample determinations, was small for paints with extremely low lead content (i.e., less than .05%), some paired determinations differed by as much as a factor of 3 because in the calculation of the lead percentages from the instrument readings, small differences in sample weight and volume, coupled with even minimal variation in instrument readings could produce this imprecision at low lead levels. (See formula above.)

The computer outputs reproduced in the Appendix, divide various groupings of the sample paints into six lead content intervals whose boundaries are 0 to 0.6%; .0601 to .1%; .1001 to .5%; .5001 to 1%; 1.001 to 10%; and over 10%. (As stated above in the general description of the testing procedure, each tabulated measurement is the average of two readings.)

The variable precision of the measurements should be kept in mind in drawing inferences from the tabulations.

3. Statistical Summaries

The pre-test sample was drawn from five stores selected to represent distinct types of retail outlets. These five types and the sizes of their inventories of included coatings* are:

1. (4682 cans) - General hardware store located in a suburban city neighborhood.
2. (31,781 cans) - Large local wholesale and retail "discount" paint and wallpaper store.
3. (23,427 cans) - Department store from a major national chain.
4. (965 cans) - Local paint store in the "inner city".
5. (2054 cans) - Semirural small paint factory with direct factory retail store.

The distinctive characteristics of these 5 stores are reflected clearly in the distributions (table 1), by primary recommended use and by can size, of the paints in the actual samples.

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* Paints clearly intended for nonresidential use, such as boat paints and certain varieties of lacquer, were exculded in advance from the sample by omitting them from the inventory listing from which the random entries were chosen. Containers larger than 5 gallons were also excluded as not being for residential use.

Table 1

Cans in Store Samples by Specified Use and Can Size

Recommended Use	Store Number 1	2	3	4	5
Walls	5	16	14	16	3
Floors	4	1	5	7	7
Metal	7	1	3	0	2
Wood	11	6	4	5	18
Trim	6	12	7	8	12
Concrete	2	3	0	0	0
"Any Surface"	12	9	17	12	5
Not Designated	2	2	0	2	1
Total	49	50	50	50	48
Can Size					
5 Gallon*	0	0	0	0	0
2 Gallon	0	2	2	0	0
1 Gallon	9	26	38	27	21
Quart	15	14	6	7	7
Pint	9	3	2	4	5
1/2 Pint	7	1	0	5	8
Spray	9	4	2	7	7
Total	49	50	50	50	48

* Five gallons was the largest container allowed in the sample, but none were actually selected via the random selection process.

The following items were recorded for each randomly chosen sample "element" on field forms used by the survey staff.

1. A line number
2. Can serial number assigned in a listing of the store inventory for purposes of random selection.
3. Purchase status--whether the selected can actually was purchased, and if not, why not (e.g., "serial number not assigned", "can already sold", etc.
4. Inclusion status; to identify cans that were included but about which there was some question as to whether they fell under the current definition of "included coatings", the target population.
5. Cost exclusive of sales tax.
6. Manufacturer name and address
7. Brand or grade name
8. Labeled recommended use
9. Paint type or base
10. Color (name and, if available, manufacturer's identifying color number)
11. Mixing status: Pre-mixed, tinting base, tinting color, custom mixed.
12. Size of can
13. Type of can; regular or spray
14. Lead warning on label
15. Manufacturer's lot number, if known.

For the computer analysis of the test results, a card was prepared for each can actually in the test, using the line numbers prefixed by a store index, and other information abridged and indexed from the field forms and the can labels. The list of tabulated categories and tabulations of the measurements of the lead contents of 247 paints are given in the Appendix, table A1. The absence of three paints from the originally selected 250 (50 from each of 5 stores) furnished an example of slippage in sampling. Two 1/2 pint cans (one from store 1 and one from store 5) disappeared somewhere in transit. One 1 quart can from store 5 opened and spilled during shipment.

Table 2 lists all individual classes which on the sample had over 15% cans of LB paint, in decreasing order according to LB percentage.

Such a tabulation from a very small sample cannot be the basis for quantitative inferences, but it can help to sharpen the qualitative analysis and also focus attention on objectives for further pre-tests.

Summary test results relevant to the objectives of a lead survey are listed and discussed below.

3.1. Lead Content Distributions

Of the total 247 can sample, 28 cans (11%) were LB. This is considerably lower than the 25% found in the "suspicious" sample reported in [1], but somewhat higher than the pre-survey expectation of 5% to 9% for the United States national total.

The percentage of LB paints in the 5 stores ranged from 4 to 16. This variation exceeded expectations.

Table 2

Sample Paint Classes with Over 15% LB

Category Descriptor	Class Descriptor	Class* Index	Cans LB/ Class	Total Cans/ Class	% LB/ Class	% LB Rank
Label Warning	"Dangerous"	(4)	12	12	100	1
Label Warning	Listed Lead Compounds	(2)	3	3	100	2
Manufacturer		(23)	2	2	100	3
Paint Type	Oil-Exterior	(6)	5	6	83	4
Manufacturer		(3)	6	8	75	5
Manufacturer		(34)	3	6	50	6
Use	For Metal	(3)	6	13	46	7
Color	Green	(7)	10	25	40	8
Can Size	1/2 Pint	(5)	8	21	38	9
Manufacturer		(26)	1	3	33	10
Paint Type	Alkyd Exterior	(2)	3	10	30	11
Manufacturer		(9)	4	17	24	12
Exterior or Interior						
Specification	Either	(3)	15	67	22	13
Finish	Gloss	(2)	21	97	22	14
Color	Yellow	(14)	6	29	21	15
Use	For Wood	(4)	9	44	21	16
Color	Red	(12)	1	5	20	17
Paint Type	Alkyd-Interior	(1)	15	80	19	18
Manufacturer		(32)	5	26	19	19
Inter. Exter. Spec.	Exterior	(2)	6	34	18	20
Can Size	1 Pint	(4)	4	23	17	21
Store		(5)	8	48	17	22
Use	Floors	(2)	4	24	17	23
Store		(1)	8	49	16	24

* See Appendix, table A1.

Of the 80 cans of latex paint in the sample (32% of the total) there were no LB paints. Indeed, 94% (75) of the cans of latex paint satisfied the 0.06%* lead limitation, proposed by several witnesses in hearings before the Subcommittee on Health of the U.S. Senate Committee on Labor and Public Welfare (1970-71), and in the other 5 cans, the highest lead content recorded was 0.21%. This is apparently in sharp contrast to the result of the sampling in [1] of 341 cans in which 22 out of 187, or 12%, were found to be LB. In that latex sample, however only 1 out of 27 tinting bases and 2 out of 88 factory mixed paints (about 2 1/2% of the 115) were LB while 17 of 72 (26%) of the custom mixed paints were LB. Thus, the supposition is fairly strong that the high lead content was contributed by the (non-latex) yellow, green and orange tinting colors used in custom mixing, and that the LB discrepance between the latex components of the subject sample and the previous one is very much smaller than would appear. On the other hand, none of the (7) tinting bases, (6) custom mixed paints or (2) tinting colors in the present sample, were LB, all testing well below 1/2% lead. In other words, these classes do exhibit marked differences in the two tests.

Considered separately, the non-latex paints constitute a 167 can sample with an LB ratio of 28/167 or 17%. The store subsample sizes from this sample have wide variation, but the spread among stores in the percentages of LB paint, is considerably smaller than the spread in the earlier survey. Table 3 summarizes this information.

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* Interpretation of thest extremely low lead readings is subject to the limitation on accuracy of the measurement technique discussed above in section 2.

Table 3

Distribution of LB Paints in the 5 Store Samples

	Store 1	Store 2	Store 3	Store 4	Store 5	Total
All Cans	49	50	50	50	48	247
Non Latex	45	27	13	37	45	167
LB All Cans	8	5	2	5	8	28
LB Non Latex	8	5	2	5	8	28
LB% All Cans	16	10	4	4	10	11
LB% Non Latex	18	19	15	14	18	17

	All	Non Latex
Mean (μ) of % LB (by store)	11.4	16.8
Variance	27.8	4.70
Standard Deviation (σ)	5.27	2.17
Coefficient of Variation (σ/μ)	.46	.13

3.2. Label Warning

Label warnings specifically concerning lead contents of paints were noticeably scarce in the sample. Labels on 190 (77%), of the 247 cans had no safety statement, other than some routine admonitions about inhalation of fumes, or swallowing the paint itself. In fact, only 33 (24%) of the 139 paints which tested below one tenth of 1% had labels expressly claiming safety for use because of the absence of lead.

Eight of the 9 cans that tested over 4% lead (well above the legal limitation) had warning labels.

Of the 28 LB paints in the sample, 16 (57%) were improperly labeled; 11 (39%) had no label information or lead warning; 3 (11%) had lead compounds listed as components but did not identify them as lead compounds (e.g., "chrome yellow") and had no other warning; 2 (7%) had labels identifying them as child safe. One of these, in fact, bore a label specifying that the paint in question was "particularly suitable for painting surfaces accessible to small children". None of these 16 cans, moreover, was specified as being primarily for exterior use.

The inappropriately labeled cans of paint were fairly well distributed among the 5 stores (3, 4, 2, 5, 2) and among 9 of the 36 manufacturers, covering, as it happens, a broad spectrum of types: 2 small independent general paint manufacturers, 3 moderately large local ones, 2 national brands* and two manufacturers of specialty paints, one local and one nationally distributed.

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* It should be noted, however, that national corporations may produce paints in regional plants.

3.3. Replicates

Cans of paint with identical labeling (that is, with identical parameter values other than store of purchase and tested lead content) are called replicates. Replicated items in a sample can furnish information about the accuracy of the measurements, the reliability of the data recording, and variability in manufacture. Thirty-nine apparent sets of replicates (29 pairs, 9 triples and 1 sextuple) were identified in the computer processing of the test results. Table 4 lists the replicates.

Because many of these sets displayed excessive within-set lead variation, they were subjected to further scrutiny: the card listings were rechecked against the can labels, the data recorded on the field forms and the calculations auxiliary to the measurements. (No remeasurement of lead content was attempted, however.) As a result, the number of replicates decreased to 24: 20 pairs, 1 triple and 1 sextuple. The false replicates in most cases resulted from color differences between paints nominally isochromatic (e.g., "light grey" and "dark grey", "dawn pink" and "rose pink", etc.). Two of the false replicates were identical in color but were from different priced brands from the same manufacturer.

For some of the sets, variations in manufacturing process may have been responsible for actual differences in lead concentration. The field survey forms used by the sampling team contained the manufacturer's lot number for each can when available. This information was omitted from the computer tabulation cards because, initially, the point of view adopted in the survey was that of the ordinary retail consumer,

Table 4

Replicates

Set #	Can: Store & Line Numbers	% Lead				Remarks
1	1-31, 35	0	0			
2	1-22, 34	.002	.002			
3	2-19, 40	.002	.003			One lot number missing
4	3-49, 48	.002	.003			Different lots
5	5-07, 10	0	.006			Same lot number as set 10 but different can size
6	2-18, 43	.004	.005			
7	4-04, 15	.007	.008			
8	4-51, 40	.005	.010			Different lots
9	5-01, 35	.008	.009			
10	5-50, 06	.006	.013			
11	5-49, 09	.009	.015			One lot number missing
12	2-31, 47	.012	.014			No lot numbers
13	4-28, 02	.01	.06			
14	4-19, 45, 47	.05	.05	.05		
15	5-22, 34, 47, 17, 43, 53	.14 .24	.15 .25	.15	.15	First 4, from a sample lot, last 2 from another
16	4-09, 42, 43	.18	.21	.21		Lot number missing on first can
17	4-31, 11, 44	.20	.21	.21		
18	4-18, 23	.25	.25			
19	2-24, 58	.29	.30			
20	4-39, 56	.45	.47			
21	5-13, 28	.75	.86			
22	1-18, 23	.83	.85			
23	5-18, 29	1.71	2.30			
24	5-04, 16	4.74	7.65			

who would normally buy paint by type, color, use, can size and possibly brand name, but would not be concerned with manufacturing batch numbers.

In sets 4, 8 and 15 the discrepancies primarily occur among cans with differing lot numbers , which points to variations in manufacture. In set 15, for instance, the first four samples of the sextuple came from one lot, the remaining pair from a second.

In set 11, the chemist who made the measurements noted that the two cans of paint in question had different proportions of solids as well as differing lead content, which may indicate non-uniformity in mixing during manufacture.

Five sets with otherwise unexplained discrepant pairs (5, 10, 21, 23, 24) all came from store number 5, the small paint factory outlet store. Two of them (23, 24) were pairs of paints with high lead content and therefore subject to the accuracy limitations of the test procedure. The suspicion that the variation in the others was a result of contamination caused by frequent batch changes in receptacles during manufacture, mixing or packaging is strengthened by the discovery that sets 5 and 10 came from the same manufacturer's lot although the cans in the two sets were of different sizes.

It is illuminating to examine the sample results in tandem with the findings in a series of tests by X-ray fluorescence of the surfaces in a randomly selected set of 115 dwelling units (DU) in Washington, D.C. [3]. The measurements in question were of the number of grams lead per centimeter of surface, i.e., lead weight per unit area. The correspondence between such measurements and lead percentage contents

by weight, of liquid paints, depends on the number of coats, the thickness per coat and other factors. The comparison must perforce be very crude and subject to possibly erroneous concidences. Examining a range of values, however, we find some very striking similarities between the two sets of data, in terms of the relative lead content of, for example, flat and gloss paints. The effect is particularly sharp for "recent" housing, i.e., housing constructed after 1959, a period for which current paint inventories have some relevance. In the tables below, 5A is based on the housing sample summaries, 5B is from the liquid paint analysis.

Tables 5A, 5B

LEAD LEVELS

In Housing Built After 1959			In Liquid Paints		
XRF Measurements mg/cm^2	% of Walls	% of Trim	% Lead	% of Cans: Wall Paint	% of Cans: Trim Paint
>6	16	24	$\geq$ .06	6	62
>8	8	17	$\geq$ .5	2	15
>10	1	6	$\geq$ 1	0	7
>15	0	1	$\geq$ 10	0	2

The juxtaposition is illustrative and no direct line by line correspondence should be inferred.

4. Deductions from the Pre-Test Sample

In the context of statistical inference, the word "confidence" has a narrow technical definition. A statement that at the .95 confidence level "8 to 13% of the cans of paint in the United States national retail inventory contain lead based paint" means that the odds are 19 to 1 that the phrase in quotation marks is correct. A formal estimate of this type can be made, assuming appropriately precise definitions of "retail inventory" and "cans of paint", by analyzing an adequately sized random sample, or a somewhat larger multistage random sample (or obviously, by conducting a complete census). The 247 can pre-test was not a random sample, having been conducted as the first step in a two or three part process intended to uncover and solve sampling and definitional problems so as to determine the sample size necessary in a three stage random sample survey aimed at making the desired national estimates.*

Of the many departures from randomness in the pre-test, the most critical are:

a. The stores were not selected randomly.

b. The "target population" (i.e., definition of which kinds of coatings were to be counted) was varied from store to store.

c. The method of selecting custom mixed paints was experimentally varied from store to store.

d. Seasonal effects were not considered in the selection, all paints having been obtained from summer inventory.

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* Note that the individual 50 can store samples were substantially random samples.

Since the sampling was not random, quantitative estimates cannot be made of the LB percentage nationally, regionally or even locally within the 250 square mile area around Chicago, Ill., from which the pre-test paints were selected.

On the other hand, non-statistical deductions can be made on the basis of the pre-test results and general knowledge of paint use and manufacturing restrictions, keeping sources of uncertainty firmly in mind.

Note first that the five stores in the pre-test ranged in size from very small to very large, but that each of their inventories included virtually every category of paint can catalogued in the range of listed coatings of interest. It is judged that the five store types represent the outlets that dispense a very large portion of the paint sold at retail in the United States. Moreover, as noted above except for some definitional variations, the cans were substantially selected randomly (i.e., without bias*) in the individual stores.

It is deduced that 1) there was a non-negligible amount of LB in the United States retail inventory of the most commonly used types of paint unless there are unsuspected strong regional differences; 2) specialty coatings (such as rust preventives, moisture resistant paints, decorative gloss paints with exotic tints, etc.) accounted for the bulk of the LB paint; and 3) premixed latex paints in current inventories are substantially lead free.

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* The criticality mentioned on the previous page is with respect to precise statistical estimation.

For whatever reason, violations of statutory lead warning label requirements are probably widespread. This suspicion arises from the fact that each of the five stores had at least two mislabeled cans and that violations were found in nationally distributed brands as well as paints produced by local independents.

Upon additiona consideration, we believe that both of the possibilities outlined in the discussion of the replicates in the sample are in fact significant: (1) Can-to-can variations in lead content actually occur in nominally uniform lots, particularly when manufacturing batch sizes are small, and (2) there is a need for refinement of procedures for laboratory measurement of the lead content of paints which have wide variations in the fractions of nonvolatile components. This process should probably be made the subject of independent statistical experiments.

The conclusions outlined above can be validated by well designed limited sample surveys.

Statements below are based on informal investigation of the utility of accurate estimates of the amount of lead in United States inventories of (liquid) paint, a subject question that was prompted partially by speculation during the pre-test analysis and partially by consideration of the general discussion of sampling, the descriptions of the population under study and the cost and time estimates in [2].

Three possible applications can be identified for the extention of the pre-test to a full sample survey capable of determining the national LB ratio to within 5%. According to analysis in [2] the cost of a survey would be about $500,000 (in 1971 dollars).

In each instance we were unable to formulate a decision process by which a level of intervention would be related to the actual lead level (as long as it exceeds zero) and in each instance we concluded that the expected survey cost would not be justified.

The three possible applications are as follows:

a. Determine quantitatively the extent to which LB occurs with improper labels in order to permit accurate assessment of the costs for inspection and enforcement. The survey plan itself would, moreover, attack in advance many of the problems of inspection strategy and test methodologies. On the other hand, it is unlikely that potential savings in inspection and enforcement costs resulting from accurate national estimates of violation rates, however defined, would offset the survey costs associated with the estimation process. At the very least, this matter should receive more than cursory cost-effectiveness analysis before a major survey is undertaken.

b. Estimate somewhat less quantitatively than in a. above the national LB ratio in order to determine the appropriate level of an educational campaign to reduce hazard by informing the public of the danger of using LB paint. Here the obvious difficulty is to relate the degree of hazard to the amount (number of cans) of LB paint on retail shelves. As in the previous instance, cost-effectiveness considerations appear, on the surface, to militate against a major survey.

c. Use inventory information to supplement and check the operation and results of lead paint in housing surveys. Here the obvious difficulty is translational. There is no simple correspondence between lead content of liquid paints and the amount of lead on painted surfaces. In addition, the likelihood that a relationship between any property of paint inventories and housing built before 1965, say, is very small.

5. References

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[2] Bauer, Bertrand N. and Machol, Robert E., "Final Report on the Pre-Tested Sampling Plan for a National Paint Inventory Study", Machol Systems, Inc., Evanston, Illinois 60202, May 30, 1972.

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Appendix

Selected Computer Tabulations

The appendix comprises reproductions of the output of about 1/4 of the computer runs of statistical tabulation programs used in the pretest.

This material is presented primarily as a matter of record, constituting as such, the only published presentation of these data, but there is an ulterior purpose in that it is possible that examination of these data may disclose hitherto undetected relationships worth investigating further.

Table A1

Classification Listing for the Computer Tabulations

Category (Factor) (In Table A2)	(In Table A4)	Class (Level)	# of Cans	%
1	2	Type or Paint Base		
		1. Alkyd-Interior	80	32
		2. Alkyd-Exterior	10	4
		3. Latex-Interior	63	26
		4. Latex-Exterior	17	7
		5. Oil-Interior	3	1
		6. Oil-Exterior	6	2
		7. Stain	9	4
		8. Sealer (not varnish sealers), Shellac	7	3
		9. Varnish	14	6
		10. Spray (non-latex)	29	12
		11. Tinting color (non-latex)	2	1
		12. Epoxy, solvent system	3	1
		13. Rubberbase	3	1
		14. Bituminous	1	0
2	3	Primary Recommended Use		
		1. Walls	54	22
		2. Floors	24	10
		3. Metal	13	5
		4. Wood	44	18

		5. Trim	45	18
		6. Concrete	5	2
		7. Any Surface	55	22
		8. Not Designated	7	3
3	4	Color		
		1. Beige	13	5
		2. Black	13	5
		3. Blue	15	6
		4. Brown	34	14
		5. Clear	8	3
		6. Gray	15	6
		7. Green	25	10
		8. Metallic	7	3
		9. Orange	6	2
		10. Pink	13	5
		11. Purple	4	2
		12. Red	5	2
		13. White	60	24
		14. Yellow	29	12
4	5	Mix		
		1. Custom Mixed or Tinting Base	13	5
		2. Premixed	232	94
		3. Tinting Color	2	1

5	6	Finish		
		1. Flat	89	32
		2. Gloss	97	39
		3. Semigloss	61	25
6	7	Can Size		
		1. 2 gallon	4	2
		2. 1 gallon	121	49
		3. Quart	49	20
		4. Pint	23	9
		5. 1/2 pint	21	9
		6. Spray (usually 3/4 pint or 1 pint)	29	12
7	8	Label Warning		
		1. No Comment about lead	190	77
		2. No warning label for lead but contents lists lead compounds (the word "lead" does not appear)	3	1
		3. "No Lead-Safe for Use" or equivalent	39	16
		4. Contains "Lead - Beware" Warning	12	5
		5. "Some Colors in this Line Contain Lead", but label does not say if this is one of the colors	3	1
8	9	Recommended Application (aside from surface type)		
		1. Interior - only	105	43
		2. Exterior - only	34	14
		3. Interior - Exterior	67	27
		4. Not Specified	41	17

9	1	Store	
		1	49
		2	50
		3	50
		4	50
		5	48
10	10	Manufacturer	
		36 Identified	247

Note: All percentages are rounded to nearest whole number. They may not, therefore, total exactly 100%.

5	6	Finish		
		1. Flat	89	32
		2. Gloss	97	39
		3. Semigloss	61	25
6	7	Can Size		
		1. 2 gallon	4	2
		2. 1 gallon	121	49
		3. Quart	49	20
		4. Pint	23	9
		5. 1/2 pint	21	9
		6. Spray (usually 3/4 pint or 1 pint)	29	12
7	8	Label Warning		
		1. No Comment about lead	190	77
		2. No warning label for lead but contents lists lead compounds (the word "lead" does not appear)	3	1
		3. "No Lead-Safe for Use" or equivalent	39	16
		4. Contains "Lead - Beware" Warning	12	5
		5. "Some Colors in this Line Contain Lead", but label does not say if this is one of the colors	3	1
8	9	Recommended Application (aside from surface type)		
		1. Interior - only	105	43
		2. Exterior - only	34	14
		3. Interior - Exterior	67	27
		4. Not Specified	41	17

9	1	Store	
		1	49
		2	50
		3	50
		4	50
		5	48
10	10	Manufacturer	
		36 Identified	247

Note: All percentages are rounded to nearest whole number. They may not, therefore, total exactly 100%.

Store, Line #	% Lead	Type	Use	Color	Mix	Finish	Size	Label Warning	Int.-Ext.	Manufacturer	
101	.02	10	7	11	2	2	6	3	3	01	1
102	.004	3	1	13	1	1	3	1	1	01	2
103	.002	9	4	4	2	1	4	1	1	01	3
104	.00	11	8	9	3	1	3	5	4	02	4
105	5.72	1	3	12	2	2	5	4	3	03	5
106	.12	5	7	8	2	2	4	1	3	01	6
107	.13	2	5	13	2	2	3	1	2	01	7
108	.20	8	4	4	2	1	4	1	3	04	8
109	1.45	1	3	6	2	2	3	2	3	03	9
110	.03	10	7	13	2	2	6	1	4	01	10
111	.004	13	6	13	2	3	2	1	3	01	11
112	2.07	10	7	7	2	2	6	1	4	01	12
113	.012	1	7	3	2	2	4	1	3	01	13
114	1.57	1	3	14	2	2	4	2	3	03	14
115	.09	1	2	6	2	2	2	1	3	01	15
116	5.35	1	3	14	2	2	5	4	3	03	16
117	.019	10	7	8	2	2	6	1	4	01	17
118	.83	2	4	4	2	3	5	1	4	01	18
119	.30	10	7	2	2	1	6	1	4	05	19
120	.05	1	1	13	1	1	3	1	1	01	20
121	.005	11	8	4	3	1	3	5	4	02	21
122	.002	3	1	13	1	1	2	1	1	01	22
123	.85	7	4	4	2	3	5	1	4	01	23
124	6.98	2	3	14	2	2	5	4	3	03	24
125	.47	1	2	6	2	3	3	1	3	01	25
126	.016	1	5	9	2	2	3	1	3	06	26
127	.38	7	4	13	2	1	3	1	4	06	27
129	7.10	6	4	13	2	3	3	4	2	01	28
130	.00	8	6	5	2	2	2	1	3	07	29
131	.00	8	4	9	2	2	4	1	4	08	30
133	.59	7	4	4	2	3	4	1	4	01	31
134	.002	3	1	13	1	1	2	1	1	01	32
135	.00	8	4	9	2	2	4	1	4	08	33
136	.04	8	4	13	2	3	2	1	4	08	34
137	.54	1	2	6	2	3	3	1	3	01	35
139	.009	10	7	2	2	2	6	3	3	01	36
140	.12	3	1	10	1	1	2	1	1	01	37
141	.12	10	7	6	2	3	6	1	4	01	38
142	.09	1	7	6	2	2	5	1	3	01	39
143	.011	1	5	13	1	3	3	1	1	01	40
144	.008	1	7	2	2	2	3	1	3	01	41
145	.22	1	2	2	2	2	3	1	3	01	42

LIST OF COMMANDS, DATA AND DIAGNOSTICS

146	.04	10	7	2	2	2	6	1	4	01	43
147	.09	12	3	3	2	3	4	1	2	03	44
148	.15	1	5	2	2	1	5	1	3	01	45
149	2.72	6	4	13	2	3	2	4	2	01	46
150	.08	1	5	13	1	3	2	1	1	01	47
151	.012	1	5	13	2	3	3	1	1	01	48
152	.64	10	3	4	2	2	6	1	3	03	49
203	.29	9	4	4	2	2	3	1	1	09	50
205	.004	3	1	1	2	1	2	1	1	09	51
206	.14	1	1	7	2	1	2	1	1	10	52
207	.094	10	8	13	2	2	6	1	4	11	53
208	.21	4	6	13	2	1	2	1	2	09	54
210	.03	4	4	7	2	1	2	1	2	09	55
213	.003	3	1	2	2	3	2	1	1	10	56
216	.02	1	5	7	2	3	3	1	1	12	57
218	.004	3	6	13	2	1	2	1	3	13	58
219	.002	3	1	13	2	1	2	1	1	09	59
220	.008	3	5	7	2	3	2	1	1	09	60
221	.005	2	7	13	2	2	2	1	2	14	61
222	.82	1	7	12	2	2	3	3	3	15	62
223	.003	3	7	13	2	1	1	1	1	10	63
224	.29	7	4	4	2	1	2	1	2	16	64
225	.005	10	7	8	2	2	6	1	3	17	65
226	.53	2	5	7	2	2	2	1	2	09	66
228	.003	3	1	14	2	1	2	1	1	16	67
229	.002	3	1	10	2	1	3	1	1	12	68
231	.012	1	5	3	2	3	3	1	1	12	69
232	.008	3	1	7	2	1	3	1	1	09	70
235	10.74	2	5	7	2	2	2	4	2	09	71
236	.004	3	1	13	2	1	3	1	1	09	72
238	.05	1	7	10	2	1	3	1	1	18	73
239	.005	3	1	13	2	1	2	1	1	09	74
240	.003	3	1	13	2	1	2	1	1	09	75
241	.15	1	5	10	2	2	5	1	3	10	76
242	.02	10	7	2	2	2	6	1	3	17	77
243	.005	3	6	13	2	1	2	1	3	13	78
244	.010	1	1	7	2	1	2	1	1	10	79
246	1.15	7	4	4	2	1	4	1	1	09	80
247	.014	1	5	3	2	3	3	1	1	12	81
248	.004	3	1	1	2	1	2	1	1	10	82
249	.09	3	8	1	2	1	3	1	1	18	83
250	.03	3	1	7	1	1	2	5	1	09	84
251	.002	1	7	13	2	2	2	1	1	18	85
252	.004	3	1	14	2	1	3	1	1	10	86
254	.002	3	7	14	2	3	3	1	1	10	87
256	.003	1	5	3	1	3	3	1	1	10	88
257	.008	1	1	7	2	1	2	1	1	10	89
258	.30	7	4	4	2	1	2	1	2	16	90
259	.56	1	5	1	2	3	3	1	3	16	91
261	.005	3	1	13	2	3	2	1	1	09	92

LIST OF COMMANDS, DATA AND DIAGNOSTICS

262	.005	3	7	13	2	1	1	1	1	10	93
263	.23	9	4	4	2	2	4	1	1	15	94
264	.10	1	5	11	2	3	2	1	1	10	95
266	1.08	1	2	4	2	2	2	1	3	09	96
267	1.49	10	3	14	2	2	6	2	3	03	97
269	1.08	1	5	7	2	3	4	3	3	09	98
271	.002	3	5	3	2	3	2	1	1	10	99
302	.11	3	5	14	2	3	2	3	1	19	100
303	.03	3	1	13	2	1	2	3	1	19	101
304	.07	5	7	7	1	1	2	3	2	19	102
305	.03	4	7	14	2	1	2	1	2	19	103
306	.008	3	2	13	2	2	2	1	3	19	104
307	.009	13	1	7	2	1	1	3	1	19	105
308	.04	3	1	13	2	1	2	3	1	19	106
309	1.27	10	7	2	2	2	6	1	3	19	107
310	.003	3	1	13	2	1	2	1	1	19	108
311	.04	4	7	13	2	1	2	3	2	19	109
313	.04	3	5	13	2	3	2	3	1	19	110
314	.04	3	2	8	2	1	2	1	3	19	111
315	.32	6	4	13	2	2	2	1	2	19	112
316	.04	3	5	11	1	3	2	1	1	19	113
317	.006	14	7	8	2	3	2	1	2	19	114
318	.004	3	1	1	2	1	3	3	1	19	115
320	.002	4	7	14	2	3	2	1	2	19	116
321	.010	3	5	1	2	3	2	3	1	19	117
322	.18	1	5	13	2	2	4	3	1	19	118
323	.009	3	2	7	2	3	2	3	3	19	119
324	.005	4	7	14	1	1	2	3	2	19	120
326	.005	3	1	13	2	1	2	3	1	19	121
329	.003	3	1	1	2	1	2	3	1	19	122
330	.005	3	1	1	2	1	2	3	1	19	123
332	.42	2	4	13	2	2	2	1	2	19	124
333	.003	3	1	9	2	1	2	3	1	19	125
334	.004	3	1	14	2	1	2	3	1	19	126
335	.011	4	7	1	2	1	2	3	2	19	127
336	.004	3	5	14	2	3	3	3	1	19	128
337	.004	4	7	14	2	1	2	3	2	19	129
338	.004	13	1	1	2	1	1	3	1	19	130
339	.005	12	7	12	2	2	3	1	2	19	131
340	.004	4	7	6	1	1	2	3	2	19	132
341	.21	1	3	13	2	2	3	3	3	19	133
342	1.21	1	2	6	2	2	2	3	3	19	134
344	.002	4	7	13	2	1	2	3	2	19	135
345	.003	3	1	14	2	1	2	3	1	19	136
346	.002	3	1	1	2	1	2	3	1	19	137
347	.10	12	3	5	2	3	4	1	2	19	138
348	.003	4	7	13	2	1	2	1	2	19	139
349	.002	4	7	13	2	1	2	1	2	19	140
350	.005	3	4	2	2	3	3	3	4	19	141
351	.58	9	4	4	2	2	3	1	1	19	142

LIST OF COMMANDS, DATA AND DIAGNOSTICS

352	.009	10	3	8	2	2	6	3	3	19	143
354	.00	3	5	13	2	3	2	3	1	19	144
356	.00	3	1	7	2	3	2	3	1	19	145
357	.00	4	7	14	2	1	2	1	2	19	146
358	.00	4	7	14	2	3	2	1	2	19	147
359	.003	3	2	6	2	3	2	3	3	19	148
360	.001	4	7	14	2	1	2	3	2	19	149
401	.10	9	4	4	2	2	5	1	4	20	150
402	.06	10	7	2	2	2	6	1	3	11	151
403	.68	5	7	14	2	1	3	1	4	21	152
404	.007	3	1	1	2	1	2	1	1	22	153
405	2.20	1	7	7	2	2	5	1	3	23	154
406	.26	1	2	6	2	2	2	1	3	24	155
407	.002	3	1	7	2	3	2	1	1	25	156
409	.18	9	4	4	2	2	4	1	4	20	157
411	.21	1	5	14	2	2	2	1	1	25	158
413	.84	1	7	4	2	2	5	1	3	20	159
414	.06	10	7	8	2	2	6	1	3	11	160
415	.008	3	1	1	2	1	2	1	1	22	161
416	.010	3	1	13	2	1	2	1	1	25	162
417	.53	1	2	4	2	2	2	1	3	26	163
418	.25	1	5	10	2	2	2	1	1	25	164
419	.05	1	1	10	2	1	2	1	1	27	165
421	.17	1	5	3	2	2	2	1	1	25	166
423	.25	1	5	10	2	2	2	1	1	25	167
424	.19	1	2	13	2	2	3	1	3	26	168
425	.41	1	2	4	2	2	3	1	3	25	169
426	.002	3	1	13	2	1	2	1	3	22	170
427	2.38	10	8	7	2	2	6	1	4	11	171
428	.010	10	7	2	2	2	6	1	3	11	172
429	.006	3	1	3	2	1	2	1	1	27	173
431	.20	1	5	14	2	2	2	1	1	25	174
432	.21	1	7	13	2	2	5	1	3	20	175
433	.48	1	5	9	2	2	2	1	1	27	176
434	.05	10	7	3	2	2	6	1	3	11	177
435	.003	3	1	7	2	1	2	1	1	14	178
436	.10	10	8	3	2	2	6	3	4	28	179
437	.002	3	1	11	2	1	2	1	1	14	180
438	1.58	1	7	7	2	2	5	1	3	23	181
439	.45	1	2	4	2	2	3	1	3	25	182
440	.010	3	1	14	2	1	2	1	1	25	183
441	.23	1	5	6	2	2	2	1	1	25	184
442	.21	9	4	4	2	2	4	1	4	20	185
443	.21	9	4	4	2	2	4	1	4	20	186
444	.21	1	5	14	2	2	2	1	1	25	187
445	.05	1	1	10	2	1	2	1	1	27	188
446	.003	3	7	13	2	1	2	1	1	22	189
447	.05	1	1	10	2	1	2	1	1	27	190
448	.35	9	4	4	2	2	2	1	4	29	191
449	.004	3	1	3	2	1	2	3	1	22	192

LIST OF COMMANDS, DATA AND DIAGNOSTICS

450	.006	3	1	14	2	1	2	1	1	14	193
451	.005	3	1	14	2	1	2	1	1	25	194
452	2.95	1	2	7	2	2	3	1	3	26	195
453	.09	10	7	3	2	2	6	1	3	11	196
454	1.65	1	7	4	2	2	4	1	3	20	197
455	.05	5	1	14	2	1	3	1	1	30	198
456	.47	1	2	4	2	2	3	1	3	25	199
501	.008	8	4	5	2	3	2	1	4	31	200
502	.24	1	2	6	2	2	2	1	3	32	201
503	.02	4	7	13	2	1	2	1	2	32	202
504	4.74	6	4	13	2	1	2	4	2	32	203
506	.013	9	4	5	2	3	4	1	4	33	204
507	.00	9	4	5	2	3	5	1	4	33	205
508	.12	1	4	4	2	2	5	1	1	34	206
509	.015	3	1	13	2	1	2	1	1	32	207
510	.006	8	4	5	2	3	5	1	4	33	208
511	.04	10	7	8	2	2	6	1	3	11	209
513	.75	7	4	10	2	1	3	1	1	33	210
515	.49	10	8	10	2	2	6	1	4	11	211
516	7.65	6	4	13	2	1	2	4	2	32	212
517	.15	1	5	13	2	3	2	1	1	32	213
518	1.71	1	4	7	2	2	5	4	1	34	214
519	.77	1	1	13	2	1	2	1	1	32	215
520	.74	1	4	3	2	3	5	1	1	34	216
521	.35	1	2	6	2	2	2	1	3	32	217
522	.14	1	5	13	2	3	2	1	1	32	218
523	.32	1	2	6	2	3	2	1	3	32	219
524	.26	10	7	4	2	2	6	1	4	35	220
525	.11	1	2	4	2	3	3	1	3	32	221
526	5.46	6	4	13	2	3	2	4	2	32	222
528	.86	7	4	10	2	1	3	1	1	33	223
529	2.30	1	4	7	2	2	5	4	1	34	224
530	.19	1	4	12	2	3	5	1	1	34	225
531	.48	1	2	6	2	2	2	1	3	32	226
532	.75	2	5	12	2	2	3	1	4	32	227
533	4.89	2	5	14	2	2	3	1	4	32	228
534	.15	1	5	13	2	3	2	1	1	32	229
535	.009	8	4	5	2	3	2	1	4	31	230
536	.13	2	5	4	2	3	2	1	4	32	231
537	3.91	1	2	7	2	2	3	1	3	32	232
539	.22	10	3	4	2	2	6	1	4	36	233
540	.83	2	5	2	2	2	3	1	4	32	234
541	.016	9	4	14	2	1	4	1	1	33	235
542	.51	10	7	10	2	2	6	1	3	11	236
543	.24	1	5	13	2	3	2	1	1	32	237
544	.12	1	2	4	2	3	2	1	3	32	238
545	.10	1	5	4	2	2	4	1	4	32	239
546	.16	10	7	3	2	2	6	1	3	11	240
547	.15	1	5	13	2	3	2	1	1	32	241
548	.49	10	3	3	2	2	6	1	4	11	242

LIST OF COMMANDS, DATA AND DIAGNOSTICS

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549     .009     3   1  13   2   1   2   1   1  32      243
550     .006     9   4   5   2   3   4   1   4  33      244
551     .22      1   5   4   2   3   4   1   4  32      245
552    1.35      1   4  14   2   2   5   4   1  34      246
553     .25      1   5  13   2   3   2   1   1  32      247
SORT 2 1 3...11
PRINT 1...11
```

How to Read the Tabulations (See table A2)

Let us use the first block (Alkyd-Interior) of the first category (Type or Base) on the first page of the computer printout sheets entitled Omnitab Lead Distribution by Tabulated Categories for interpretation.

.06	17.	21.25	17.	21.25
.10	5.	6.25	22.	27.50
.50	36.	45.00	58.	72.50
1.00	7.	8.75	65.	81.25
10.00	15.	18.75	80.	100.00
100.00	0.	.00	80.	100.00

The number in line 6, column 4 is the number of cans in the group. There are 80 cans of "Alkyd-Interior" paint in the sample. (The sum of the numbers in line 6, column 4 in all the blocks in a category is thus 247, the size of the total sample.)

The numbers in columns 2 and 4 are can counts. The numbers in columns 3 and 5 are corresponding percentages of the cans in the group.

The numbers in column 1 are the maximum percentages of lead in the contents of the cans specified in columns 2 and 4 of the given line.

The numbers in columns 2 and 3 are interval values. Those in columns 4 and 5 are cumulative.

Reading line 3, for instance:

58 in (column 4) shows 58 cans out of the total of 80 Alkyd-Interior paints contain no more than 1/2% lead (column 1). This is 72 1/2% (column 5) of the 80 paints in the group.

36 (column 2) of the cans contain more than 1/10% but no more then 1/2% lead (column 1). This is 45% (Column 3) of the 80 paints in the group.

Notes on the Division into Categories (See tables A2 and A3)

Categories 1 and 8:

The division under oil, latex and alkyd into "exterior" and "interior" can be misleading. When the data cards were prepared using can label information, all paints specified as having any possible interior application were designated in category 1 as interior paints because they were considered to constitute members of "hazard" classes by their availability for use on child accessible surfaces. Subsequently, category 8 was defined to tabulate principal recommended application. Although the breakdown according to 1 was used for some listings, we think now that it should be discarded, where appropriate, in favor of the distinction in category 8.

Categories 2 and 5:

Most "wall" paint was flat. Most trim, wood, metal, and floor paint was gloss.

Category 3:

The 14 listed colors are a distillation from almost 70 manufacturers' color designations (some quite exotic).

Category 4:

The stores are listed in the order surveyed; the treatment of custom mixing was varied from store to store during the pre-test development of survey procedures.

In store 1, there was no custom mixing but where tinting bases entered the sample they were identified as such.

In stores 2 and 3, tinting bases selected were used to custom mix the tinting color chosen by (different) random selection schemes.

There was no custom mixing available in store #4.

Store 5 "custom mixes" by modifying premixed paints with tints to meet customer specifications. Since the predetermined method of introducing custom mixed paints into the sample was chance selection of tinting bases, no custom mixed paint was taken from this store. A change in the selection method should be made to accomodate this type of store if it is not unique or "near unique".

Category 7:

Classes 1 and 2 are really identical except to professional chemists who can recognize the presence of lead in the compounds listed.

In any subsequent tests or compilations the cans listed under class 2 would (or will) be assigned to class 1 ("no warning"), and class 2 will be reserved for labels which identify lead compounds whose names include the word "lead".

Category 9:

The inventory sizes for "included coatings" (see page 7) were as follows:

Store 1 - 4,682 cans
2 - 31,781 cans
3 - 23,427 cans
4 - 965 cans
5 - 2054 cans

Category 10:

The tabulation was omitted from the initial computer runs and made by hand. It is, therefore, not as detailed as the other tabulations. We have omitted the identities of the manufacturers in this report.

Reading:

Lead Levels

In each class there is listed:

The number and % of cans containing

1) 0 to 0.06% lead by weight of solids

2) more than 0.06 to 0.1%, etc.

3) more than 0.1% to 0.5%

4) more than 0.5% to 1.0%

5) more than 1.0% to 10.0%

6) more than 10%

as well as the analogous cumulative intervals:

1) up to .06% lead by weight of solids

2) 1 and 2 above

3) 1, 2 and 3 above, etc.

These are labeled with the high values of the intervals. Thus, e.g., "1.0%" means up to 1% or alternatively 1/2% to 1%. "100%" means above 10%.

In addition to the tabulations of the sample for the 10 categories, there are store by store tabulations for the first 8 categories.

Each nomograph plots lead % level against some other characteristic, every spike displaying lead levels for paints with a given index value of the characteristic. An additional paint characteristic is represented in each of these plots by using a different print symbol for different index values of the characteristic. The symbols 1-9, 0, A-Z are used in that order. Thus, e.g. the symbol for "white" under color will be C because white is color #13; and manufacturer #24 will be N, N being the 24th symbol in the list.

The plots do not have a distinct representation for every can. When two or more paints in a spike have lead % levels whose difference is equal to or smaller than the smallest interval on the vertical axis, the symbol corresponding to the last one encountered in the input listing of the paints, is displayed. Numbers appearing in parentheses above spike in some of the nomograms indicate the actual number of paints in the spike.

As an example, let us examine the second nomogram following, which plots percent lead against paint type using "store" as plotting character.

The vertical axis is marked from 0 to 10.74 (the smallest and largest recorded lead percentages) while the horizontal axis runs from 1 to 14 (the number of types). The total number of cans (observations) is listed in the lower right hand corner under the graph frame. Column 1 represents "level" 1 (Interior-Alkyd) for the factor "TYPE".

The graph shows 1 can of paint at about 5.6% lead and 1 can at 5.37% in store #1 and a can at 4.03% from store #5, etc. Notice that according to the top of the page there are altogether 80 cans of alkyd-interior paint in the 247 can sample, but only 13 points are plotted in the column. This means that the remaining 67 have lead levels sufficiently close to the plotted cans that they were suppressed by overprinting. Note also that missing values for the plot character do not necessarily mean that the particular characteristics do not occur in the sample. The number 3 does not appear in the plotted values in column 1 but in fact there were cans of interior-alkyd paint in the sample from store #3 with lead percent values of .18, .21 and 1.21. The first two of these are suppressed by observations from store #5 (second entry from the bottom of the column) and the third by one of the two observations from store #5 (fifth or sixth from the bottom).

Notes on Tabulations (See Table A4)

These computer printouts tabulate the number and percentage of paints which contain lead in excess of 0.5% (the first table) and 1.0% (the second table) considered as a "dependent variable" against the indices of the various recorded characteristics of the paints. They differ from the tabulations in A1 in that in each block the classes ("levels") occur in the order encountered in the input data cards (the left hand 6 columns in each block) and ordered by decreasing percent of paints failing the lead content criterion (the right most 6 columns in each block).

In the headings the statement, "The input interval of interest is (.50050, 200.00), i.e., here we are referring to values over .5 (percent). The value 200.00 is a peculiarity of the computer program and is of no consequence.

Each table is followed by a list giving a complete ordering of all classes of all category according to percent in excess of the limit of interest (i.e., 0.5% or 1.0%).

TABLE A 2

OMNITAB LEAD DISTRIBUTION BY TABULATED CATEGORIES

Lead Content	No. Cans/ Interval	% Cans/ Interval	Cumulative No. Cans	Cumulative % of Cans	Category: Type or Paint Base
0.0 Up to .06% Lead	17.	21.25	17.	21.25	
Over .06 Up to .10	5.	6.25	22.	27.50	
Over .10 Up to .50	36.	45.00	58.	72.50	
Over .50 Up to 1.00	7.	8.75	65.	81.25	Alkyd-Interior
Over 1.0 Up to 10.00	15.	18.75	80.	100.00	
Over 10.0 (Up to 100.00)	0.	.00	80.	100.00	
.06	1.	10.00	1.	10.00	
.10	0.	.00	1.	10.00	
.50	3.	30.00	4.	40.00	Alkyd-Exterior
1.00	3.	30.00	7.	70.00	
10.00	2.	20.00	9.	90.00	
100.00	1.	10.00	10.	100.00	
.06	60.	95.24	60.	95.24	
.10	1.	1.59	61.	96.83	
.50	2.	3.17	63.	100.00	Latex-Interior
1.00	0.	.00	63.	100.00	
10.00	0.	.00	63.	100.00	
100.00	0.	.00	63.	100.00	
.06	15.	88.24	15.	88.24	
.10	1.	5.88	16.	94.12	
.50	1.	5.88	17.	100.00	Latex-Exterior
1.00	0.	.00	17.	100.00	
10.00	0.	.00	17.	100.00	
100.00	0.	.00	17.	100.00	
.06	1.	33.33	1.	33.33	
.10	0.	.00	1.	33.33	
.50	1.	33.33	2.	66.67	Oil-Interior
1.00	1.	33.33	3.	100.00	
10.00	0.	.00	3.	100.00	
100.00	0.	.00	3.	100.00	
.06	0.	.00	0.	.00	
.10	0.	.00	0.	.00	
.50	1.	16.67	1.	16.67	Oil-Exterior
1.00	0.	.00	1.	16.67	
10.00	5.	83.33	6.	100.00	
100.00	0.	.00	6.	100.00	
.06	0.	.00	0.	.00	
.10	0.	.00	0.	.00	
.50	3.	33.33	3.	33.33	Stain
1.00	5.	55.56	8.	88.89	
10.00	1.	11.11	9.	100.00	
100.00	0.	.00	9.	100.00	
.06	6.	85.71	6.	85.71	
.10	0.	.00	6.	85.71	
.50	1.	14.29	7.	100.00	Sealer (not varnish sealers), Shellac
1.00	0.	.00	7.	100.00	
10.00	0.	.00	7.	100.00	
100.00	0.	.00	7.	100.00	
.06	6.	42.86	6.	42.86	
.10	1.	7.14	7.	50.00	
.50	6.	42.86	13.	92.86	Varnish

1.00	1.	7.14	14.	100.00	
10.00	0.	.00	14.	100.00	
100.00	0.	.00	14.	100.00	
.04	15.	51.72	15.	51.72	
.10	1.	3.45	16.	55.17	
.50	7.	24.14	23.	79.31	Spray (Non-latex)
1.00	2.	6.90	25.	86.21	
10.00	4.	13.79	29.	100.00	
100.00	0.	.00	29.	100.00	
.04	2.	100.00	2.	100.00	
.10	0.	.00	2.	100.00	
.50	0.	.00	2.	100.00	Tinting Color
1.00	0.	.00	2.	100.00	(Non-latex)
10.00	0.	.00	2.	100.00	
100.00	0.	.00	2.	100.00	
.04	1.	33.33	1.	33.33	
.10	2.	66.67	3.	100.00	
.50	0.	.00	3.	100.00	Epoxy, solvent system
1.00	0.	.00	3.	100.00	
10.00	0.	.00	3.	100.00	
100.00	0.	.00	3.	100.00	
.04	3.	100.00	3.	100.00	
.10	0.	.00	3.	100.00	
.50	0.	.00	3.	100.00	Rubberbase
1.00	0.	.00	3.	100.00	
10.00	0.	.00	3.	100.00	
100.00	0.	.00	3.	100.00	
.04	1.	100.00	1.	100.00	
.10	0.	.00	1.	100.00	
.50	0.	.00	1.	100.00	Bituminous
1.00	0.	.00	1.	100.00	
10.00	0.	.00	1.	100.00	
100.00	0.	.00	1.	100.00	

					Primary Recommended Use
.06	51.	94.44	51.	94.44	
.10	0.	.00	51.	94.44	
.50	2.	3.70	53.	98.15	
1.00	1.	1.85	54.	100.00	Walls
10.00	0.	.00	54.	100.00	
100.00	0.	.00	54.	100.00	
.06	4.	16.67	4.	16.67	
.10	1.	4.17	5.	20.83	
.50	13.	54.17	18.	75.00	Floors
1.00	2.	8.33	20.	83.33	
10.00	4.	16.67	24.	100.00	
100.00	0.	.00	24.	100.00	
.06	1.	7.69	1.	7.69	
.10	2.	15.38	3.	23.08	
.50	3.	23.08	6.	46.15	Metal
1.00	1.	7.69	7.	53.85	
10.00	6.	46.15	13.	100.00	
100.00	0.	.00	13.	100.00	
.06	13.	29.55	13.	29.55	
.10	1.	2.27	14.	31.82	
.50	14.	31.82	28.	63.64	Wood
1.00	7.	15.91	35.	79.55	
10.00	9.	20.45	44.	100.00	
100.00	0.	.00	44.	100.00	
.06	14.	31.11	14.	31.11	
.10	3.	6.67	17.	37.78	
.50	21.	46.67	38.	84.44	Trim
1.00	4.	8.89	42.	93.33	
10.00	2.	4.44	44.	97.78	
100.00	1.	2.22	45.	100.00	
.06	4.	80.00	4.	80.00	
.10	0.	.00	4.	80.00	
.50	1.	20.00	5.	100.00	Concrete
1.00	0.	.00	5.	100.00	
10.00	0.	.00	5.	100.00	
100.00	0.	.00	5.	100.00	
.06	38.	69.09	38.	69.09	
.10	2.	3.64	40.	72.73	
.50	6.	10.91	46.	83.64	Any Surface
1.00	4.	7.27	50.	90.91	
10.00	5.	9.09	55.	100.00	
100.00	0.	.00	55.	100.00	
.06	3.	42.86	3.	42.86	
.10	2.	28.57	5.	71.43	
.50	1.	14.29	6.	85.71	Not Designated
1.00	0.	.00	6.	85.71	
10.00	1.	14.29	7.	100.00	
100.00	0.	.00	7.	100.00	

					Color
.04	11.	84.62	11.	84.62	
.10	1.	7.69	12.	92.31	
.50	0.	.00	12.	92.31	Beige
1.00	1.	7.69	13.	100.00	
10.00	0.	.00	13.	100.00	
100.00	0.	.00	13.	100.00	
.04	8.	61.54	8.	61.54	
.10	0.	.00	8.	61.54	
.50	3.	23.08	11.	84.62	Black
1.00	1.	7.69	12.	92.31	
10.00	1.	7.69	13.	100.00	
100.00	0.	.00	13.	100.00	
.04	9.	60.00	9.	60.00	
.10	2.	13.33	11.	73.33	
.50	3.	20.00	14.	93.33	Blue
1.00	1.	6.67	15.	100.00	
10.00	0.	.00	15.	100.00	
100.00	0.	.00	15.	100.00	
.04	3.	8.82	3.	8.82	
.10	2.	5.88	5.	14.71	
.50	19.	55.88	24.	70.59	Brown
1.00	7.	20.59	31.	91.18	
10.00	3.	8.82	34.	100.00	
100.00	0.	.00	34.	100.00	
.04	7.	87.50	7.	87.50	
.10	1.	12.50	8.	100.00	
.50	0.	.00	8.	100.00	Clear
1.00	0.	.00	8.	100.00	
10.00	0.	.00	8.	100.00	
100.00	0.	.00	8.	100.00	
.04	2.	13.33	2.	13.33	
.10	2.	13.33	4.	26.67	
.50	8.	53.33	12.	80.00	Gray
1.00	1.	6.67	13.	86.67	
10.00	2.	13.33	15.	100.00	
100.00	0.	.00	15.	100.00	
.04	12.	48.00	12.	48.00	
.10	1.	4.00	13.	52.00	
.50	1.	4.00	14.	56.00	Green
1.00	1.	4.00	15.	60.00	
10.00	9.	36.00	24.	96.00	
100.00	1.	4.00	25.	100.00	
.04	6.	85.71	6.	85.71	
.10	0.	.00	6.	85.71	
.50	1.	14.29	7.	100.00	Metallic
1.00	0.	.00	7.	100.00	
10.00	0.	.00	7.	100.00	
100.00	0.	.00	7.	100.00	
.04	5.	83.33	5.	83.33	
.10	0.	.00	5.	83.33	
.50	1.	16.67	6.	100.00	Orange

1.00	0.	.00	6.	100.00	
10.00	0.	.00	6.	100.00	
100.00	0.	.00	6.	100.00	
.06	5.	38.46	5.	38.46	
.10	0.	.00	5.	38.46	
.50	5.	38.46	10.	76.92	Pink
1.00	3.	23.08	13.	100.00	
10.00	0.	.00	13.	100.00	
100.00	0.	.00	13.	100.00	
.06	3.	75.00	3.	75.00	
.10	1.	25.00	4.	100.00	
.50	0.	.00	4.	100.00	Purple
1.00	0.	.00	4.	100.00	
10.00	0.	.00	4.	100.00	
100.00	0.	.00	4.	100.00	
.06	1.	20.00	1.	20.00	
.10	0.	.00	1.	20.00	
.50	1.	20.00	2.	40.00	Red
1.00	2.	40.00	4.	80.00	
10.00	1.	20.00	5.	100.00	
100.00	0.	.00	5.	100.00	
.06	38.	63.33	38.	63.33	
.10	1.	1.67	39.	65.00	
.50	15.	25.00	54.	90.00	White
1.00	1.	1.67	55.	91.67	
10.00	5.	8.33	60.	100.00	
100.00	0.	.00	60.	100.00	
.06	18.	62.07	18.	62.07	
.10	0.	.00	18.	62.07	
.50	4.	13.79	22.	75.86	Yellow
1.00	1.	3.45	23.	79.31	
10.00	6.	20.69	29.	100.00	
100.00	0.	.00	29.	100.00	

					Mix
.06	10.	76.92	10.	76.92	
.10	2.	15.38	12.	92.31	
.50	1.	7.69	13.	100.00	
1.00	0.	.00	13.	100.00	Custom Mixed or Tinting Base
10.00	0.	.00	13.	100.00	
100.00	0.	.00	13.	100.00	
.06	116.	50.00	116.	50.00	
.10	9.	3.88	125.	53.88	
.50	60.	25.84	185.	79.74	Premixed
1.00	19.	8.19	204.	87.93	
10.00	27.	11.64	231.	99.57	
100.00	1.	.43	232.	100.00	
.06	2.	100.00	2.	100.00	
.10	0.	.00	2.	100.00	
.50	0.	.00	2.	100.00	
1.00	0.	.00	2.	100.00	Tinting Base
10.00	0.	.00	2.	100.00	
100.00	0.	.00	2.	100.00	

					Finish
.06	71.	79.78	71.	79.78	
.10	2.	2.25	73.	82.02	
.50	9.	10.11	82.	92.13	Flat
1.00	4.	4.49	86.	96.63	
10.00	3.	3.37	89.	100.00	
100.00	0.	.00	89.	100.00	
.06	25.	25.77	25.	25.77	
.10	5.	5.15	30.	30.93	
.50	37.	38.14	67.	69.07	Gloss
1.00	9.	9.28	76.	78.35	
10.00	20.	20.62	96.	98.97	
100.00	1.	1.03	97.	100.00	
.06	32.	52.46	32.	52.46	
.10	4.	6.56	36.	59.02	
.50	15.	24.59	51.	83.61	Semigloss
1.00	6.	9.84	57.	93.44	
10.00	4.	6.56	61.	100.00	
100.00	0.	.00	61.	100.00	

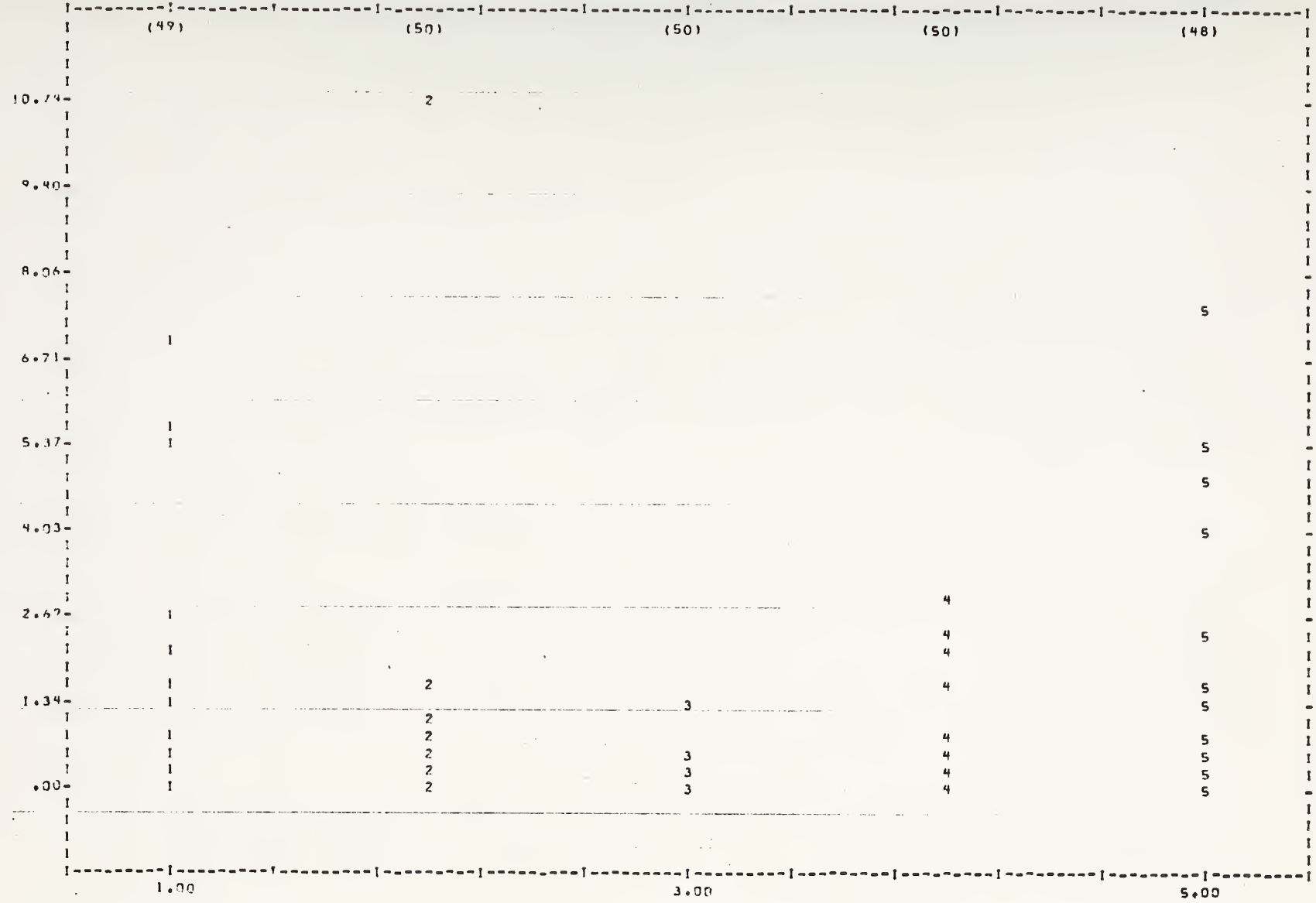
					Can Size
.06	4.	100.00	4.	100.00	
.10	0.	.00	4.	100.00	
.50	0.	.00	4.	100.00	
1.00	0.	.00	4.	100.00	2 gallon
10.00	0.	.00	4.	100.00	
100.00	0.	.00	4.	100.00	
.06	77.	63.64	77.	63.64	
.10	4.	3.31	81.	66.94	
.50	30.	24.79	111.	91.74	
1.00	3.	2.48	114.	94.21	1 gallon
10.00	6.	4.96	120.	99.17	
100.00	1.	.83	121.	100.00	
.06	23.	46.94	23.	46.94	
.10	1.	2.04	24.	48.98	
.50	11.	22.45	35.	71.43	
1.00	9.	18.37	44.	89.80	Quart
10.00	5.	10.20	49.	100.00	
100.00	0.	.00	49.	100.00	
.06	7.	30.43	7.	30.43	
.10	3.	13.04	10.	43.48	
.50	8.	34.78	18.	78.26	
1.00	1.	4.35	19.	82.61	Pint
10.00	4.	17.39	23.	100.00	
100.00	0.	.00	23.	100.00	
.06	2.	9.52	2.	9.52	
.10	2.	9.52	4.	19.05	
.50	5.	23.81	9.	42.86	
1.00	4.	19.05	13.	61.90	1/2 Pint
10.00	8.	38.10	21.	100.00	
100.00	0.	.00	21.	100.00	
.06	15.	51.72	15.	51.72	
.10	1.	3.45	16.	55.17	
.50	7.	24.14	23.	79.31	
1.00	2.	6.90	25.	86.21	Spray (Usually 3/4 pint
10.00	4.	13.79	29.	100.00	or 1 pint)
100.00	0.	.00	29.	100.00	

					Label Warning
.06	94.	49.47	94.	49.47	
.10	9.	4.74	103.	54.21	
.50	58.	30.53	161.	84.74	No comment about lead.
1.00	18.	9.47	179.	94.21	
10.00	11.	5.79	190.	100.00	
100.00	0.	.00	190.	100.00	
.06	0.	.00	0.	.00	
.10	0.	.00	0.	.00	No warning label for lead,
.50	0.	.00	0.	.00	but contents lists lead
1.00	0.	.00	0.	.00	compounds (the word "lead"
10.00	3.	100.00	3.	100.00	does not appear).
100.00	0.	.00	3.	100.00	
.06	31.	79.49	31.	79.49	
.10	2.	5.13	33.	84.62	
.50	3.	7.69	36.	92.31	"No Lead-Safe for Use"
1.00	1.	2.56	37.	94.87	or equivalent.
10.00	2.	5.13	39.	100.00	
100.00	0.	.00	39.	100.00	
.06	0.	.00	0.	.00	
.10	0.	.00	0.	.00	
.50	0.	.00	0.	.00	Contains Lead-Beware Warning.
1.00	0.	.00	0.	.00	
10.00	11.	91.67	11.	91.67	
100.00	1.	8.33	12.	100.00	
.06	3.	100.00	3.	100.00	
.10	0.	.00	3.	100.00	"Some Colors in this line
.50	0.	.00	3.	100.00	Contain Lead", but label does
1.00	0.	.00	3.	100.00	not say if this is one of the
10.00	0.	.00	3.	100.00	colors.
100.00	0.	.00	3.	100.00	

					Recommended Application (Aside from Surface Type)
.06	71.	67.62	71.	67.62	
.10	3.	2.86	74.	70.48	
.50	22.	20.95	96.	91.43	
1.00	5.	4.76	101.	96.19	Interior - only
10.00	4.	3.81	105.	100.00	
100.00	0.	.00	105.	100.00	
.06	18.	52.94	18.	52.94	
.10	3.	8.82	21.	61.76	
.50	6.	17.65	27.	79.41	
1.00	1.	2.94	28.	82.35	Exterior - only
10.00	5.	14.71	33.	97.06	
100.00	1.	2.94	34.	100.00	
.06	23.	34.33	23.	34.33	
.10	2.	2.99	25.	37.31	
.50	20.	29.85	45.	67.16	Interior - Exterior
1.00	7.	10.45	52.	77.61	
10.00	15.	22.39	67.	100.00	
100.00	0.	.00	67.	100.00	
.06	16.	39.02	16.	39.02	
.10	3.	7.32	19.	46.34	
.50	13.	31.71	32.	78.05	Not Specified
1.00	6.	14.63	38.	92.68	
10.00	3.	7.32	41.	100.00	
100.00	0.	.00	41.	100.00	

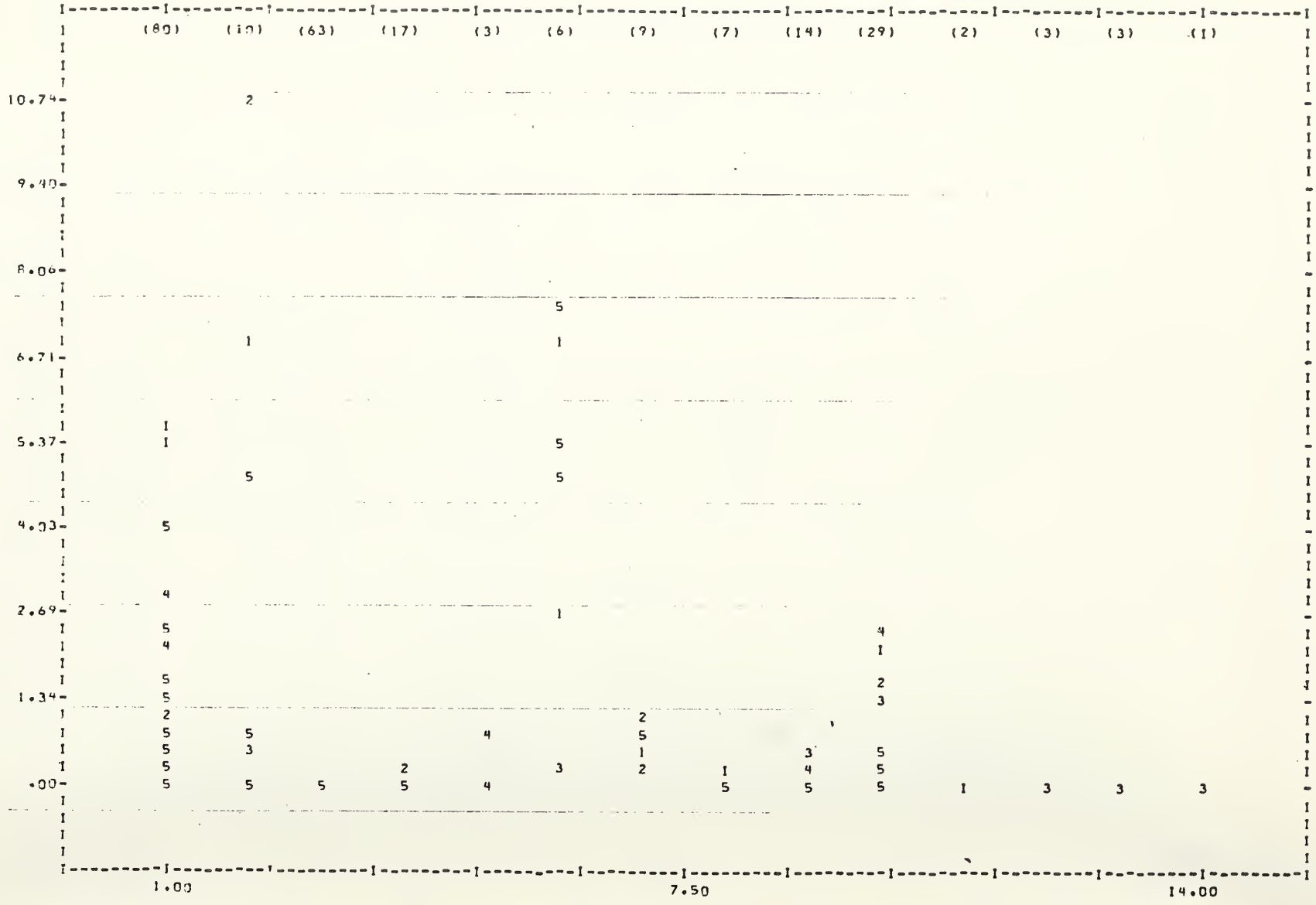
					Store
.06	22.	44.90	22.	44.90	
.10	4.	8.16	26.	53.06	
.50	10.	20.41	36.	73.47	
1.00	5.	10.20	41.	83.67	1
10.00	8.	16.33	49.	100.00	
100.00	0.	.00	49.	100.00	
.06	33.	66.00	33.	66.00	
.10	2.	4.00	35.	70.00	
.50	7.	14.00	42.	84.00	
1.00	3.	6.00	45.	90.00	2
10.00	4.	8.00	49.	98.00	
100.00	1.	2.00	50.	100.00	
.06	40.	80.00	40.	80.00	
.10	2.	4.00	42.	84.00	
.50	5.	10.00	47.	94.00	
1.00	1.	2.00	48.	96.00	3
10.00	2.	4.00	50.	100.00	
100.00	0.	.00	50.	100.00	
.06	22.	44.00	22.	44.00	
.10	2.	4.00	24.	48.00	
.50	18.	36.00	42.	84.00	
1.00	3.	6.00	45.	90.00	4
10.00	5.	10.00	50.	100.00	
100.00	0.	.00	50.	100.00	
.06	11.	22.92	11.	22.92	
.10	1.	2.08	12.	25.00	
.50	21.	43.75	33.	68.75	
1.00	7.	14.58	40.	83.33	5
10.00	8.	16.67	48.	100.00	
100.00	0.	.00	48.	100.00	

T A B L E A 3



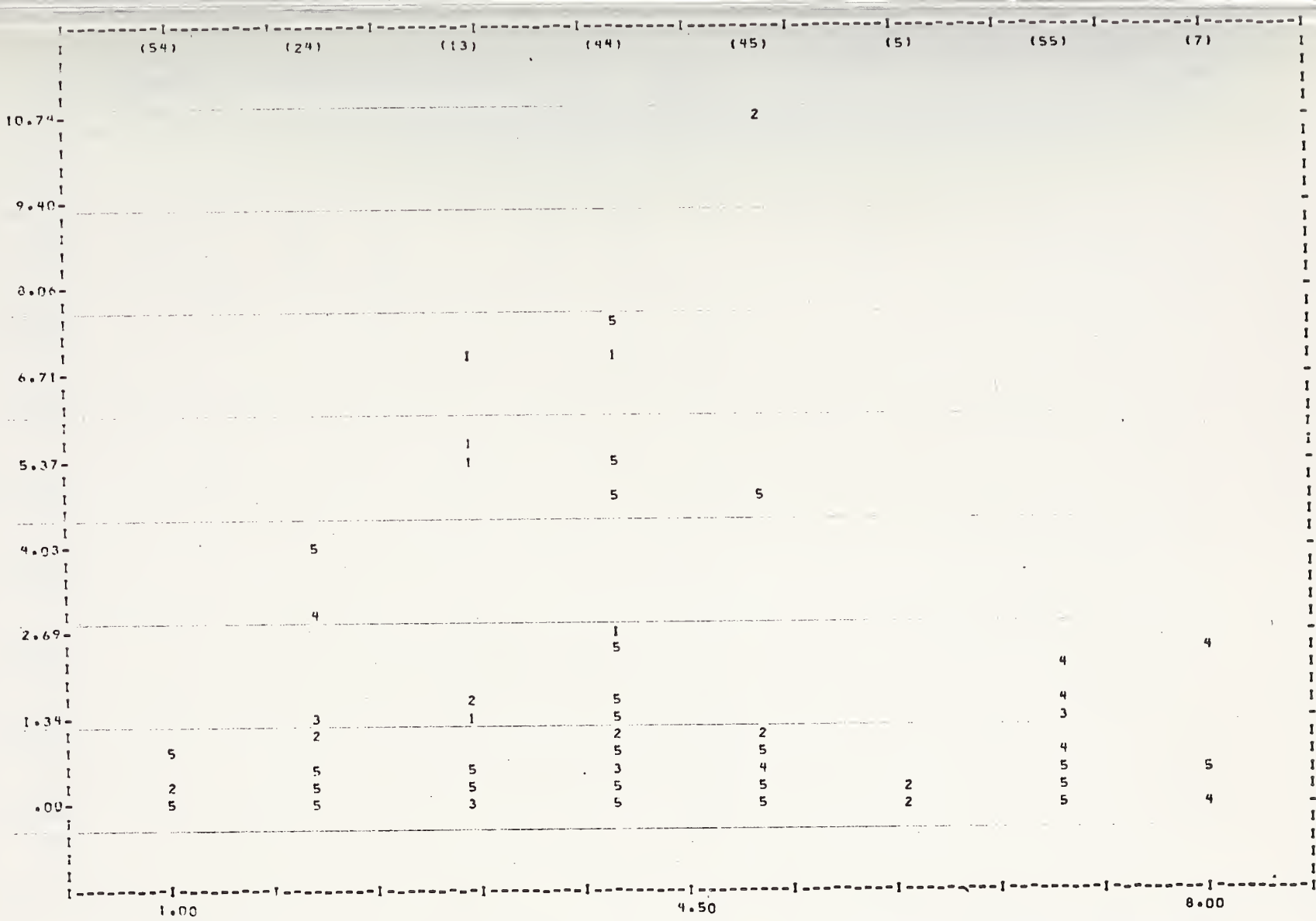
LEAD (VERTICAL AXIS) VERSUS STORE (HORIZONTAL AXIS)

THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247



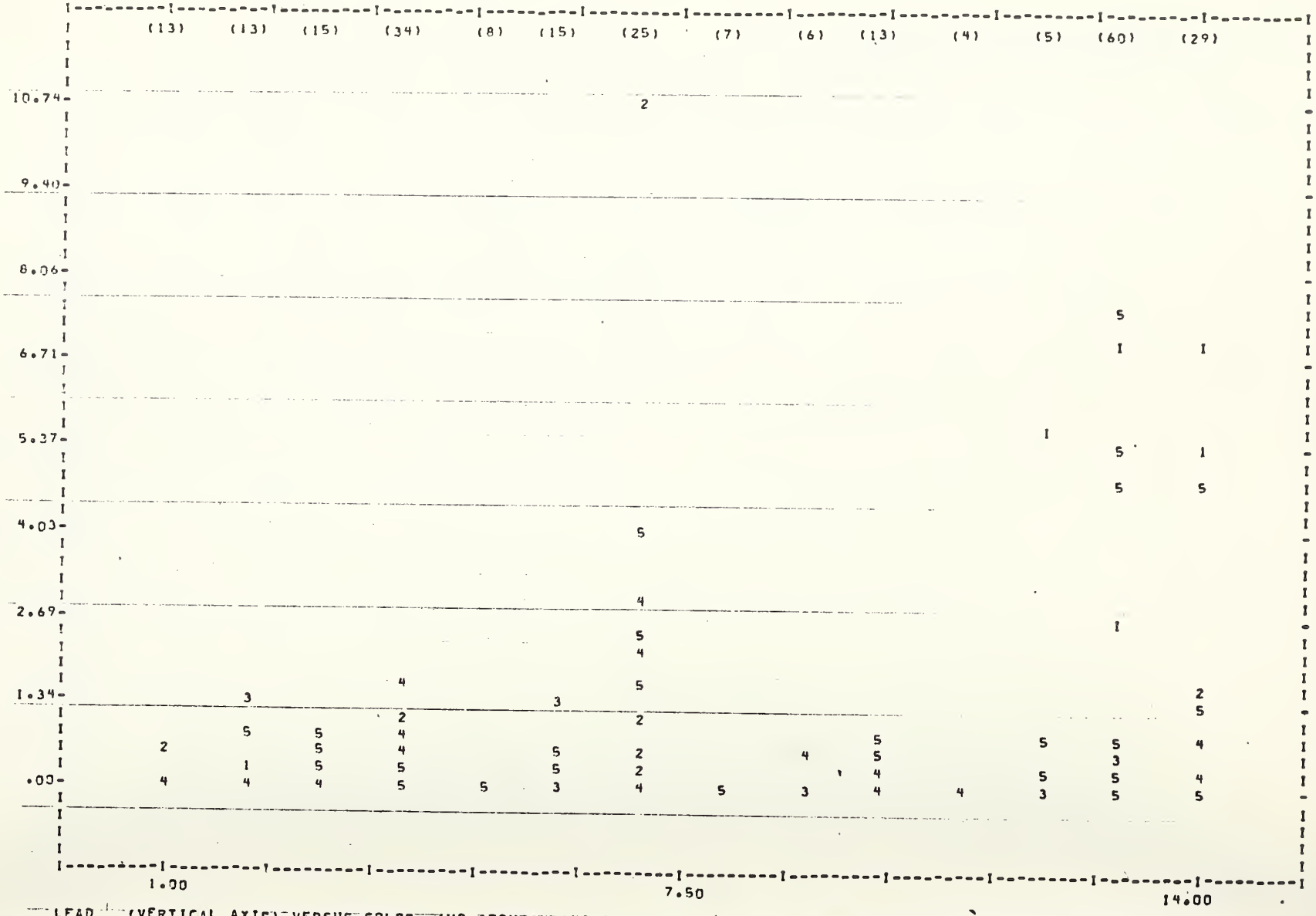
LEAD (VERTICAL AXIS) VERSUS TYPE (HORIZONTAL AXIS)

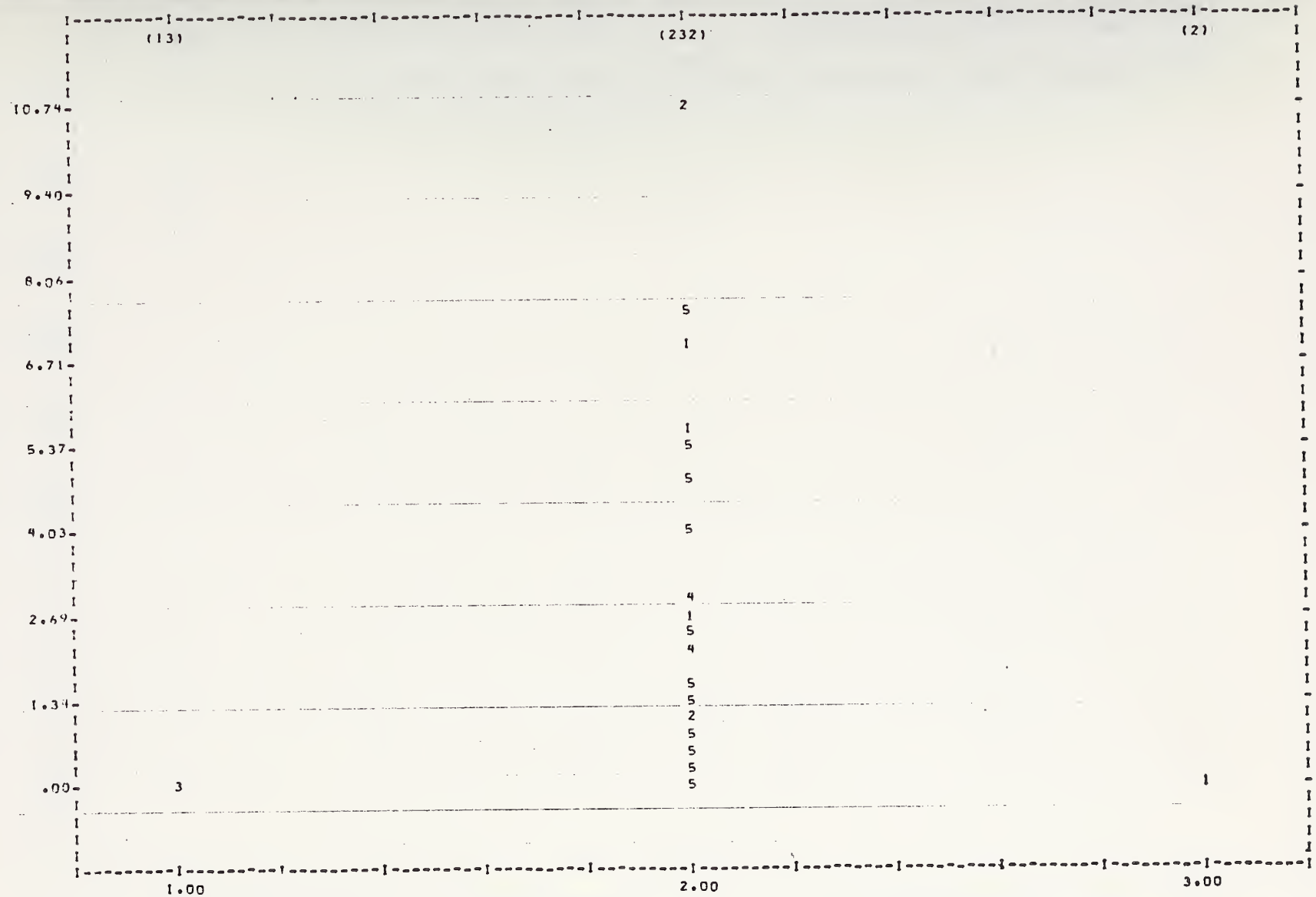
THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247

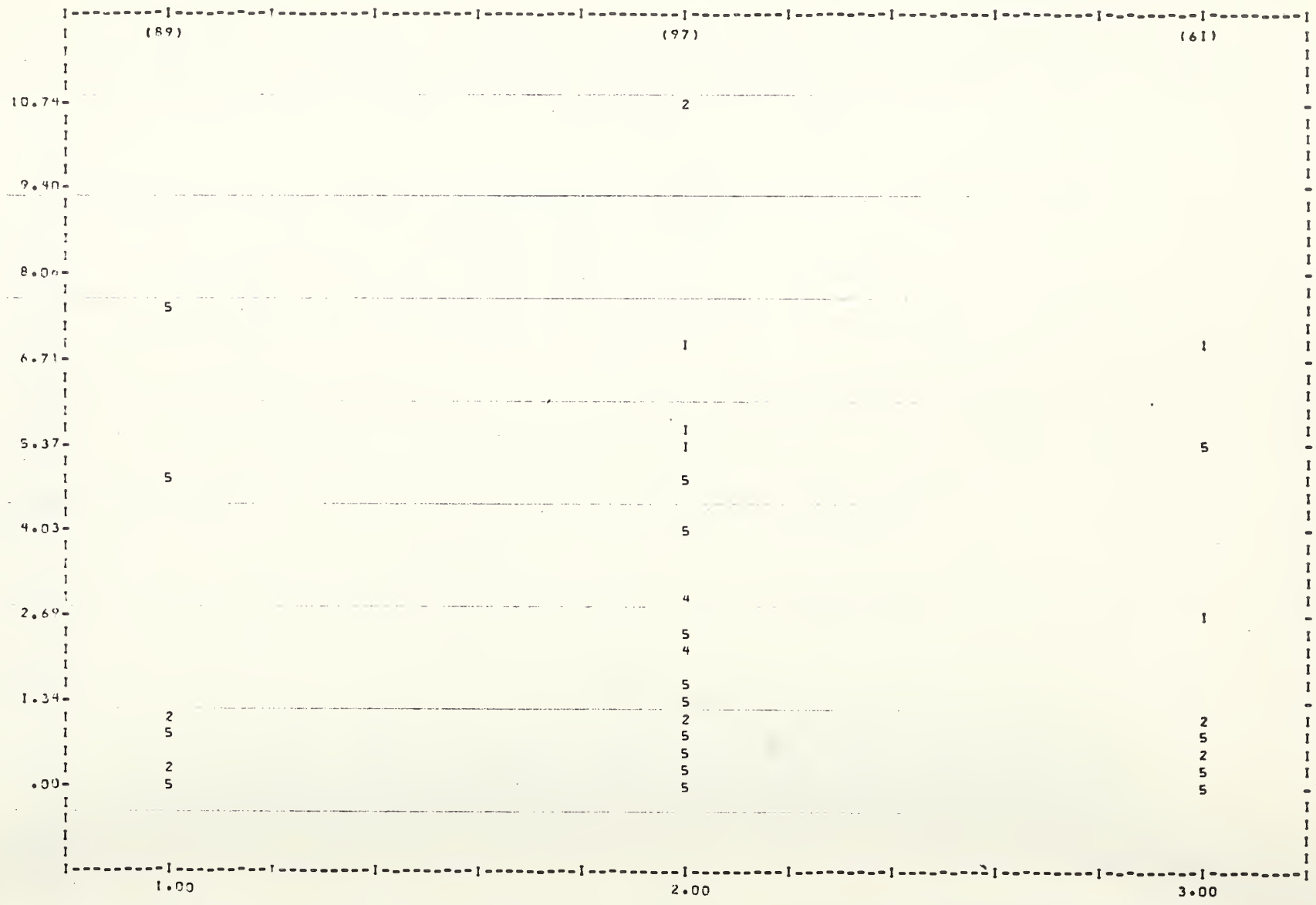


LEAD (VERTICAL AXIS) VERSUS USE (HORIZONTAL AXIS)

THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247

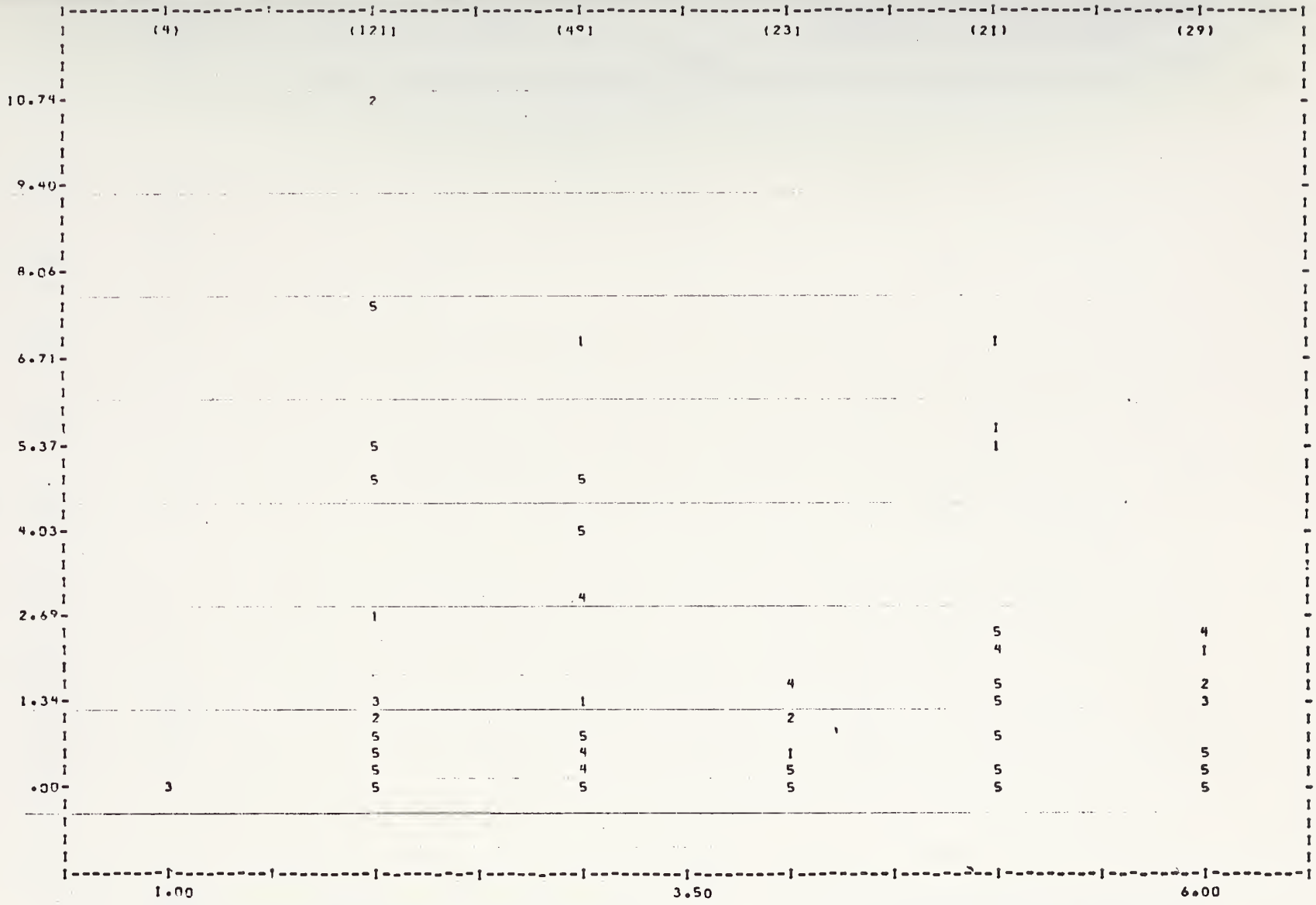

(13) (13) (15) (34) (8) (15) (25) (7) (6) (13) (4) (5) (60) (29)
10.74
9.40
8.06
6.71
5.37
4.03
2.69
1.34
.00
1.00
7.50
14.00
LEAD (VERTICAL AXIS) VERSUS COLOR (HORIZONTAL AXIS)
THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247

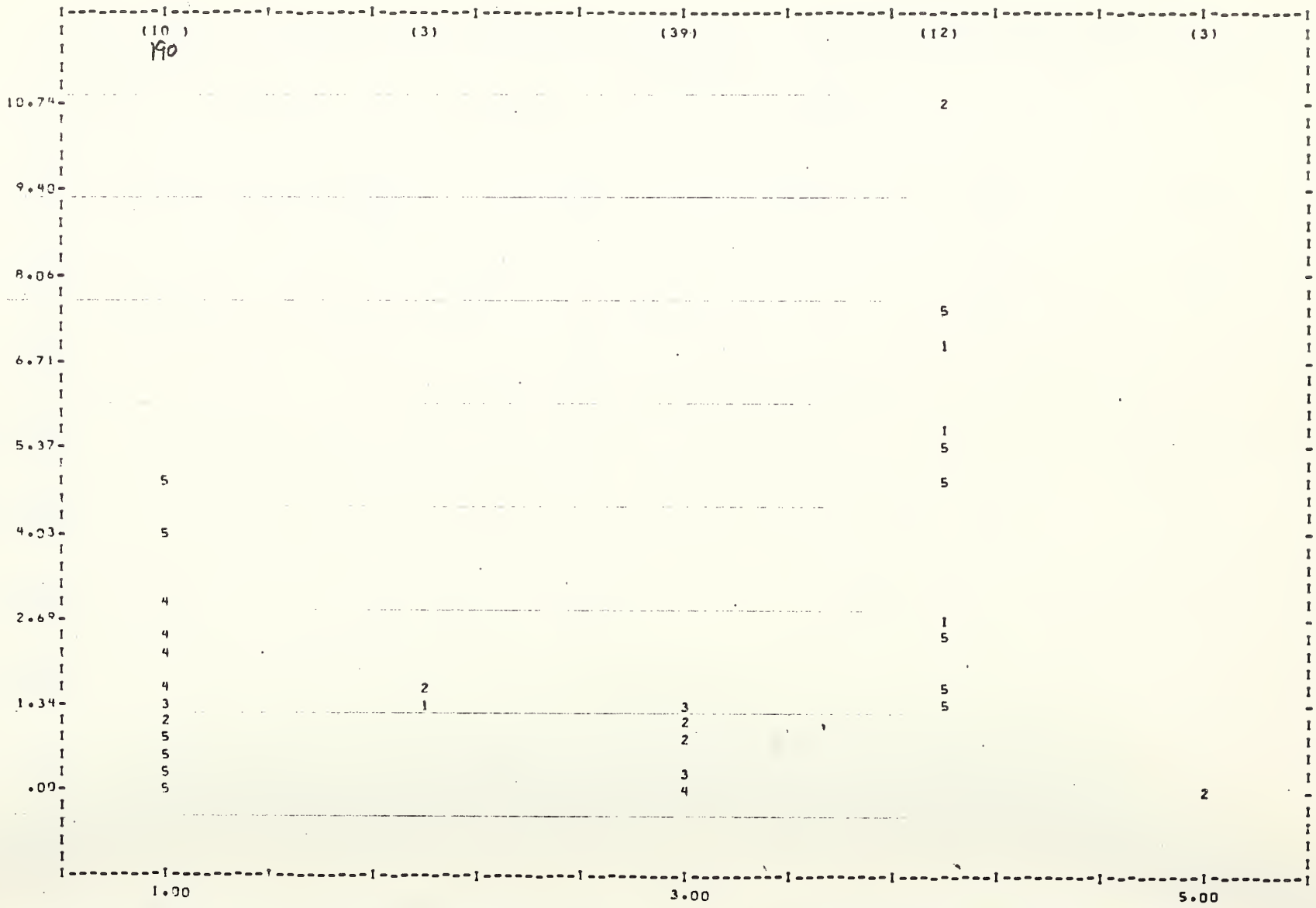

(13)
(232)
(2)
10.74
9.40
8.06
6.71
5.37
4.03
2.69
1.34
.00
1.00
2.00
3.00
LEAD (VERTICAL AXIS) VERSUS MIX (HORIZONTAL AXIS)
THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247



LEAD (VERTICAL AXIS) VERSUS FINISH (HORIZONTAL AXIS)

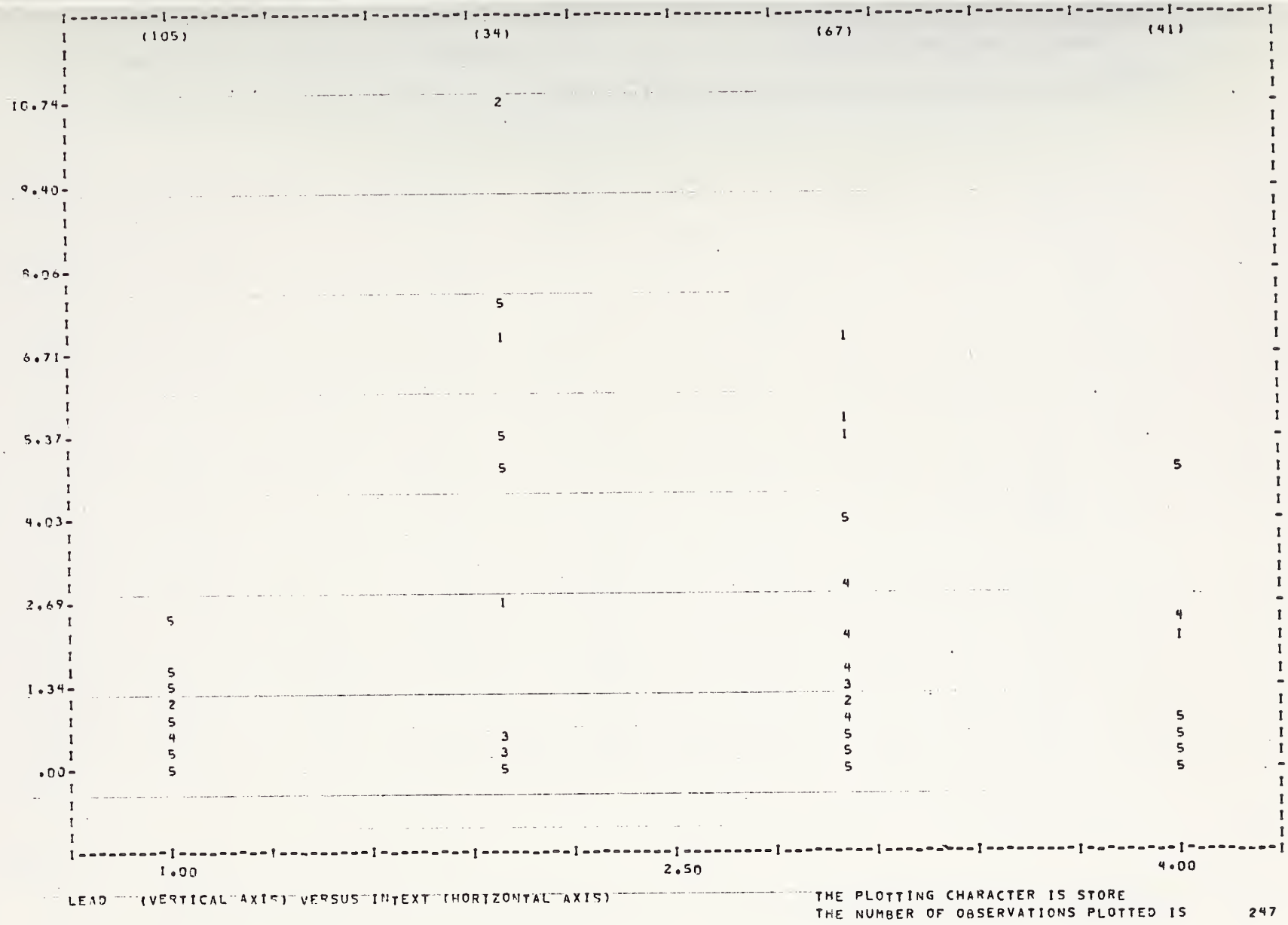
THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247

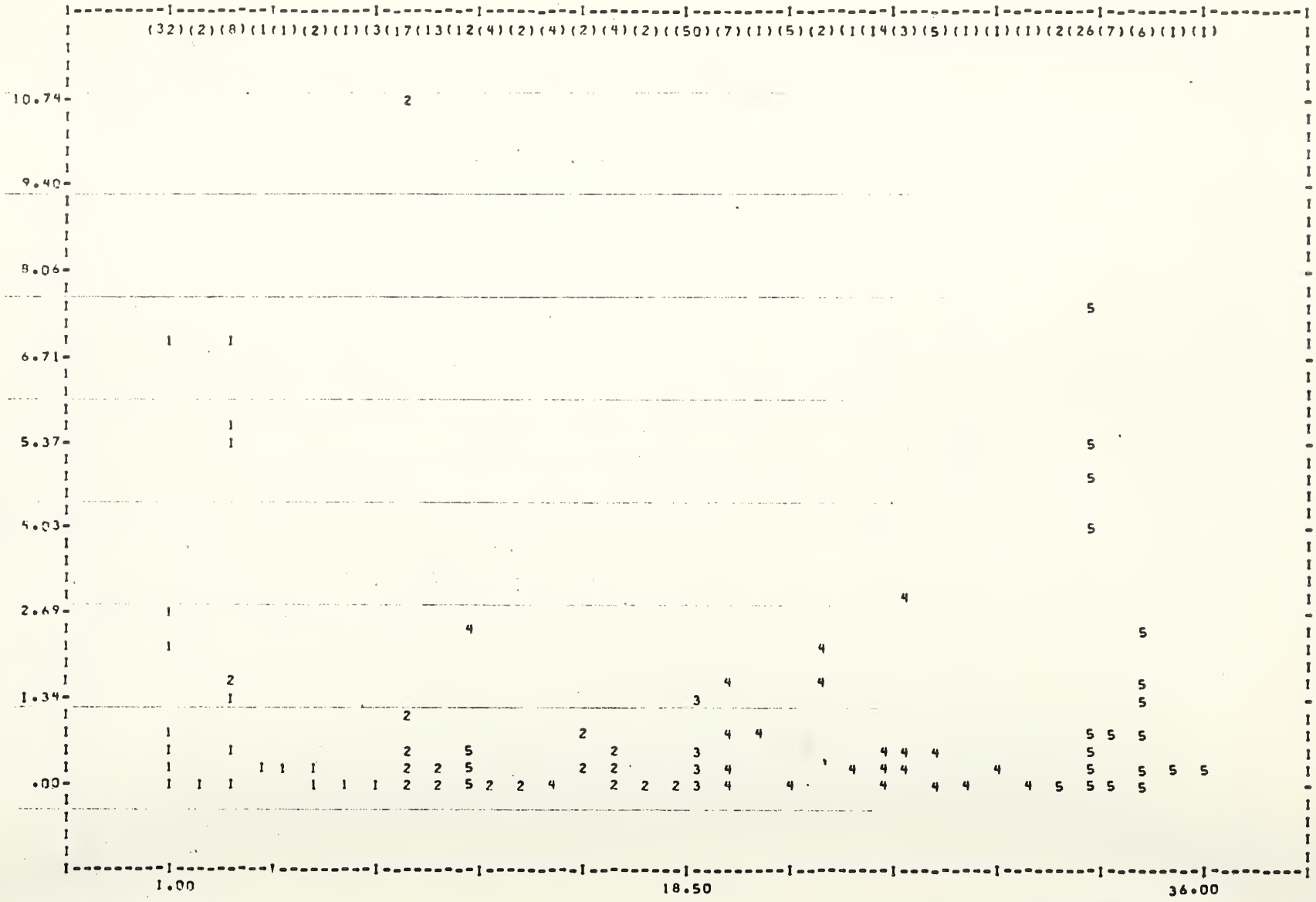

(4) (121) (49) (23) (21) (29)
10.74
9.40
8.06
6.71
5.37
4.03
2.69
1.34
.00
1.00
3.50
6.00
LEAD (VERTICAL AXIS) VERSUS SIZE (HORIZONTAL AXIS)
THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247



LEAD (VERTICAL AXIS) VERSUS LABEL (HORIZONTAL AXIS)

THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247

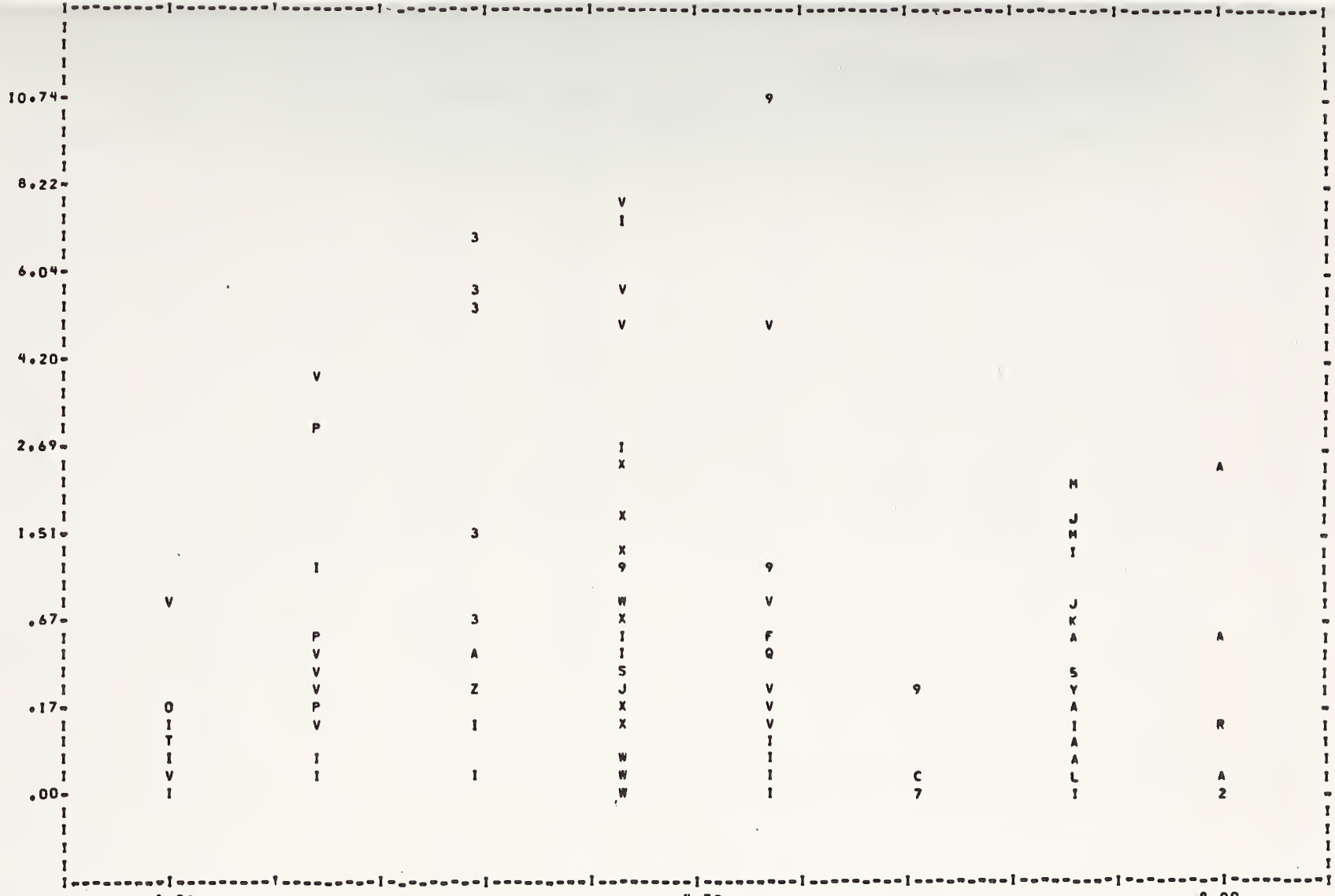

(105)
(34)
(67)
(41)
10.74
9.40
8.06
6.71
5.37
4.03
2.69
1.34
.00
1.00
2.50
4.00
LEAD (VERTICAL AXIS) VERSUS INTEXT (HORIZONTAL AXIS)
THE PLOTTING CHARACTER IS STORE
THE NUMBER OF OBSERVATIONS PLOTTED IS 247



LEAD (VERTICAL AXIS) VERSUS MANUFR (HORIZONTAL AXIS)

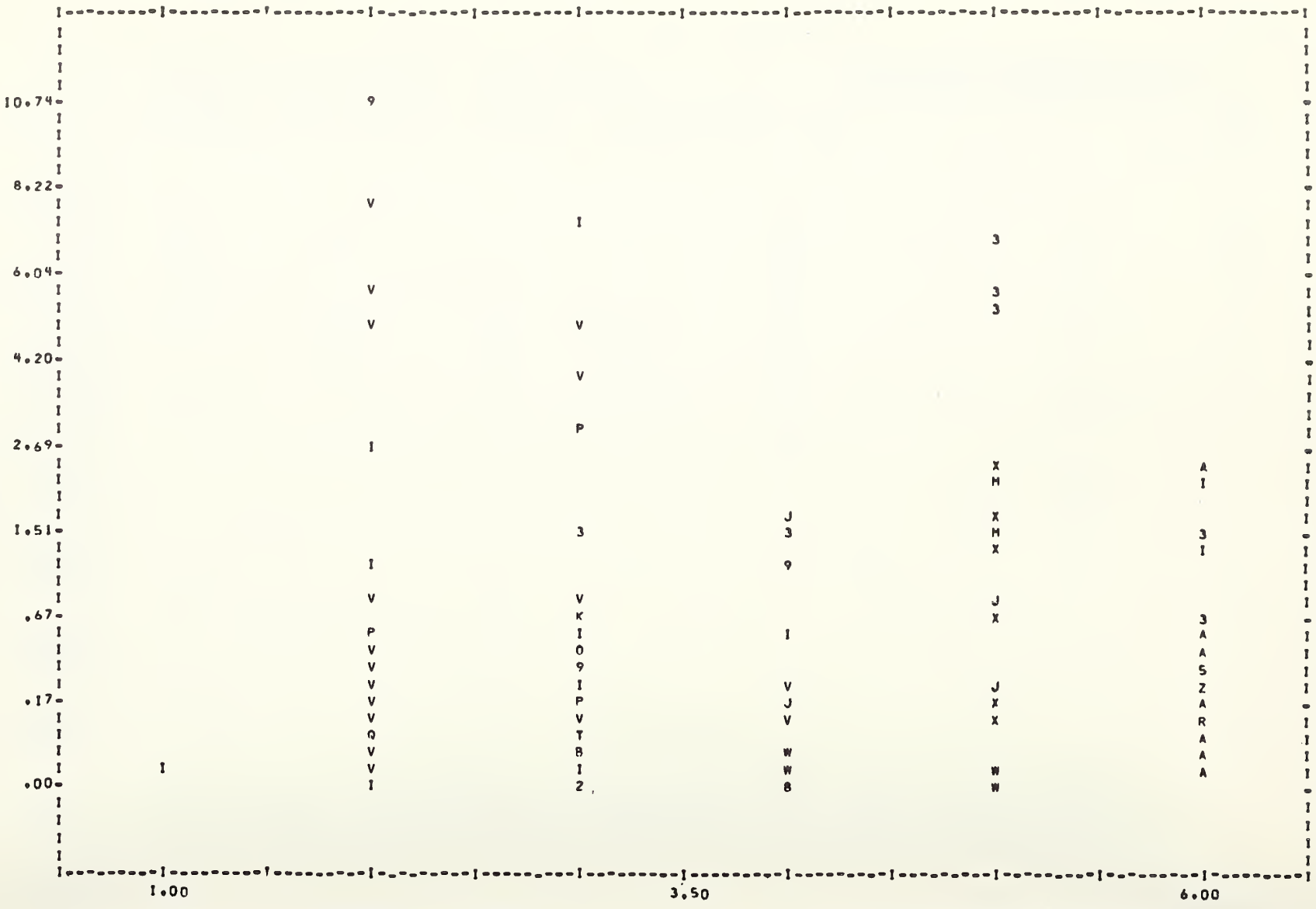
THE PLOTTING CHARACTER IS STORE

THE NUMBER OF OBSERVATIONS PLOTTED IS 247



LEAD (VERTICAL AXIS) VERSUS USE (HORIZONTAL AXIS)

THE PLOTTING CHARACTER IS MANUFR
THE NUMBER OF OBSERVATIONS PLOTTED IS 247



LEAD (VERTICAL AXIS) VERSUS SIZE (HORIZONTAL AXIS)

THE PLOTTING CHARACTER IS MANUFR

THE NUMBER OF OBSERVATIONS PLOTTED IS 247

T A B L E A 4

ANALYSIS OF COUNTS FOR EACH LEVEL OF EACH FACTOR

THE NUMBER OF INPUT OBSERVATIONS IS 247
THE NUMBER OF INPUT FACTORS IS 10
INPUT ARGUMENT 9 = INPUT ARGUMENT 9 AND SO
ALL 247 OBSERVATIONS OF THE RESPONSE VECTOR WERE ANALYZED
THE INPUT RESPONSE INTERVAL OF INTEREST IS (.500050, 200.000000)

THE TOTAL NUMBER OF OBSERVATIONS ANALYZED IS 247
THE TOTAL NUMBER OF OBSERVATIONS IN THE RESPONSE INTERVAL OF INTEREST IS 47
THE PERCENTAGE OF OBSERVATIONS IN THE RESPONSE INTERVAL OF INTEREST IS 19.028
THE STANDARD DEVIATION OF THIS PERCENTAGE VALUE IS 2.498

FACTOR-LEVEL DECOMPOSITION

FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE	*	FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE
1.	1.	49	13	26.531	6.307	*	1.	5.	48	15	31.250	6.690
1.	2.	50	8	16.000	5.185	*	1.	1.	49	13	26.531	6.307
1.	3.	50	3	6.000	3.359	*	1.	4.	50	8	16.000	5.185
1.	4.	50	8	16.000	5.185	*	1.	2.	50	8	16.000	5.185
1.	5.	48	15	31.250	6.690	*	1.	3.	50	3	6.000	3.359
						*						
2.	10.	29	6	20.690	7.522	*	2.	6.	6	5	83.333	15.215
2.	3.	63	0	.000	.000	*	2.	7.	9	6	66.667	15.713
2.	9.	14	1	7.143	6.883	*	2.	2.	10	6	60.000	15.492
2.	11.	2	0	.000	.000	*	2.	5.	3	1	33.333	27.217
2.	1.	80	22	27.500	4.992	*	2.	1.	80	22	27.500	4.992
2.	5.	3	1	33.333	27.217	*	2.	10.	29	6	20.690	7.522
2.	2.	10	6	60.000	15.492	*	2.	9.	14	1	7.143	6.883
2.	8.	7	0	.000	.000	*	2.	8.	7	0	.000	.000
2.	13.	3	0	.000	.000	*	2.	3.	63	0	.000	.000
2.	7.	9	6	66.667	15.713	*	2.	11.	2	0	.000	.000
2.	6.	6	5	83.333	15.215	*	2.	4.	17	0	.000	.000
2.	12.	3	0	.000	.000	*	2.	13.	3	0	.000	.000
2.	4.	17	0	.000	.000	*	2.	12.	3	0	.000	.000
2.	14.	1	0	.000	.000	*	2.	14.	1	0	.000	.000
						*						
3.	7.	55	9	16.364	4.989	*	3.	3.	13	7	53.846	13.926
3.	1.	54	1	1.852	1.835	*	3.	4.	44	16	36.364	7.252

3.	4.	44	16	36.364	7.252	*	3.	2.	24	6	25.000	8.839
3.	8.	7	1	14.286	13.226	*	3.	7.	55	9	16.364	4.988
3.	3.	13	7	53.846	13.926	*	3.	5.	45	7	15.556	5.403
3.	5.	45	7	15.556	5.403	*	3.	8.	7	1	14.286	13.226
3.	6.	5	0	.000	.000	*	3.	1.	54	1	1.852	1.835
3.	2.	24	6	25.000	8.839	*	3.	6.	5	0	.000	.000
						*						
						*						
4.	11.	4	0	.000	.000	*	4.	12.	5	3	60.000	21.909
4.	13.	60	6	10.000	3.973	*	4.	7.	25	11	44.000	9.928
4.	4.	34	10	29.412	7.814	*	4.	4.	34	10	29.412	7.814
4.	9.	6	0	.000	.000	*	4.	14.	29	7	24.138	7.946
4.	12.	5	3	60.000	21.909	*	4.	10.	13	3	23.077	11.685
4.	8.	7	0	.000	.000	*	4.	6.	15	3	20.000	10.328
4.	6.	15	3	20.000	10.328	*	4.	2.	13	2	15.385	10.007
4.	7.	25	11	44.000	9.928	*	4.	13.	60	6	10.000	3.973
4.	3.	15	1	6.667	6.441	*	4.	1.	13	1	7.692	7.391
4.	14.	29	7	24.138	7.946	*	4.	3.	15	1	6.667	6.441
4.	2.	13	2	15.385	10.007	*	4.	5.	8	0	.000	.000
4.	5.	8	0	.000	.000	*	4.	8.	7	0	.000	.000
4.	10.	13	3	23.077	11.685	*	4.	9.	6	0	.000	.000
4.	1.	13	1	7.692	7.391	*	4.	11.	4	0	.000	.000
						*						
						*						
5.	2.	232	47	20.259	2.639	*	5.	2.	232	47	20.259	2.639
5.	1.	13	0	.000	.000	*	5.	3.	2	0	.000	.000
5.	3.	2	0	.000	.000	*	5.	1.	13	0	.000	.000
						*						
						*						
6.	2.	97	30	30.928	4.693	*	6.	2.	97	30	30.928	4.693
6.	1.	89	7	7.865	2.853	*	6.	3.	61	10	16.393	4.740
6.	3.	61	10	16.393	4.740	*	6.	1.	89	7	7.865	2.853
						*						
						*						
7.	6.	29	6	20.690	7.522	*	7.	5.	21	12	57.143	10.709
7.	3.	49	14	28.571	6.454	*	7.	3.	49	14	28.571	6.454
7.	4.	23	5	21.739	8.601	*	7.	4.	23	5	21.739	8.601
7.	5.	21	12	57.143	10.709	*	7.	6.	29	6	20.690	7.522
7.	2.	121	10	8.264	2.503	*	7.	2.	121	10	8.264	2.503
7.	1.	4	0	.000	.000	*	7.	1.	4	0	.000	.000
						*						
						*						
8.	3.	39	3	7.692	4.267	*	8.	2.	3	3	100.000	.000
8.	1.	190	29	15.263	2.609	*	8.	4.	12	12	100.000	.000
8.	5.	3	0	.000	.000	*	8.	1.	190	29	15.263	2.609
8.	4.	12	12	100.000	.000	*	8.	3.	39	3	7.692	4.267
8.	2.	3	3	100.000	.000	*	8.	5.	3	0	.000	.000
						*						
						*						
9.	3.	67	22	32.836	5.737	*	9.	3.	67	22	32.836	5.737
9.	1.	105	9	8.571	2.732	*	9.	4.	41	9	21.951	6.464
9.	4.	41	9	21.951	6.464	*	9.	2.	34	7	20.588	6.934
9.	2.	34	7	20.588	6.934	*	9.	1.	105	9	8.571	2.732
						*						
						*						
10.	1.	32	7	21.875	7.308	*	10.	21.	1	1	100.000	.000
10.	2.	2	0	.000	.000	*	10.	23.	2	2	100.000	.000
10.	3.	8	7	87.500	11.693	*	10.	3.	8	7	87.500	11.693

10.	4.	1	0	.000	.000	*	10.	34.	6	4	66.667	19.245
10.	5.	1	0	.000	.000	*	10.	26.	3	2	66.667	27.217
10.	6.	2	0	.000	.000	*	10.	15.	2	1	50.000	35.355
10.	7.	1	0	.000	.000	*	10.	32.	26	8	30.769	9.052
10.	8.	3	0	.000	.000	*	10.	9.	17	5	29.412	11.051
10.	9.	17	5	29.412	11.051	*	10.	33.	7	2	28.571	17.075
10.	10.	13	0	.000	.000	*	10.	20.	7	2	28.571	17.075
10.	11.	12	2	16.667	10.758	*	10.	16.	4	1	25.000	21.651
10.	12.	4	0	.000	.000	*	10.	1.	32	7	21.875	7.308
10.	13.	2	0	.000	.000	*	10.	11.	12	2	16.667	10.758
10.	14.	4	0	.000	.000	*	10.	19.	50	3	6.000	3.359
10.	15.	2	1	50.000	35.355	*	10.	12.	4	0	.000	.000
10.	16.	4	1	25.000	21.651	*	10.	10.	13	0	.000	.000
10.	17.	2	0	.000	.000	*	10.	8.	3	0	.000	.000
10.	18.	3	0	.000	.000	*	10.	7.	1	0	.000	.000
10.	19.	50	3	6.000	3.359	*	10.	6.	2	0	.000	.000
10.	20.	7	2	28.571	17.075	*	10.	5.	1	0	.000	.000
10.	21.	1	1	100.000	.000	*	10.	4.	1	0	.000	.000
10.	22.	5	0	.000	.000	*	10.	2.	2	0	.000	.000
10.	23.	2	2	100.000	.000	*	10.	13.	2	0	.000	.000
10.	24.	1	0	.000	.000	*	10.	14.	4	0	.000	.000
10.	25.	14	0	.000	.000	*	10.	35.	1	0	.000	.000
10.	26.	3	2	66.667	27.217	*	10.	31.	2	0	.000	.000
10.	27.	5	0	.000	.000	*	10.	30.	1	0	.000	.000
10.	28.	1	0	.000	.000	*	10.	29.	1	0	.000	.000
10.	29.	1	0	.000	.000	*	10.	28.	1	0	.000	.000
10.	30.	1	0	.000	.000	*	10.	27.	5	0	.000	.000
10.	31.	2	0	.000	.000	*	10.	25.	14	0	.000	.000
10.	32.	26	8	30.769	9.052	*	10.	17.	2	0	.000	.000
10.	33.	7	2	28.571	17.075	*	10.	36.	1	0	.000	.000
10.	34.	6	4	66.667	19.245	*	10.	22.	5	0	.000	.000
10.	35.	1	0	.000	.000	*	10.	24.	1	0	.000	.000
10.	36.	1	0	.000	.000	*	10.	18.	3	0	.000	.000
						*						
						*						

MOST SIGNIFICANT LEVEL OF EACH FACTOR

FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE
1	5.	48	15	31.250	6.690
2	6.	6	5	83.333	15.215
3	3.	13	7	53.846	13.826
4	12.	5	3	60.000	21.909
5	2.	232	47	20.259	2.639
6	2.	97	30	30.928	4.693
7	5.	21	12	57.143	10.799
8	2.	3	3	100.000	.000
9	3.	67	22	32.836	5.737

10	21.	1	1	100.000	.000

ORDERING OF FACTOR-LEVEL COMBINATIONS

FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE
9.	2.	3	3	100.000	.000
10.	23.	2	2	100.000	.000
10.	21.	1	1	100.000	.000
9.	4.	12	12	100.000	.000
10.	3.	8	7	87.500	11.693
2.	6.	6	5	83.333	15.215
10.	34.	6	4	66.667	19.245
10.	26.	3	2	66.667	27.217
2.	7.	9	6	66.667	15.713
2.	2.	10	6	60.000	15.492
4.	12.	5	3	60.000	21.909
7.	5.	21	12	57.143	10.799
3.	3.	13	7	53.846	13.926
10.	15.	2	1	50.000	35.355
4.	7.	25	11	44.000	9.928
3.	4.	44	16	36.364	7.252
2.	5.	3	1	33.333	27.217
9.	3.	67	22	32.836	5.737
1.	5.	48	15	31.250	6.690
6.	2.	97	30	30.928	4.693
10.	32.	26	8	30.769	9.052
4.	4.	34	10	29.412	7.914
10.	9.	17	5	29.412	11.051
10.	20.	7	2	28.571	17.075
10.	33.	7	2	28.571	17.075
7.	3.	49	14	28.571	6.454
2.	1.	80	22	27.500	4.992
1.	1.	49	13	26.531	6.307
10.	16.	4	1	25.000	21.651
3.	2.	24	6	25.000	8.839
4.	14.	29	7	24.138	7.946
4.	10.	13	3	23.077	11.685
9.	4.	41	9	21.951	6.464
10.	1.	32	7	21.875	7.308
7.	4.	23	5	21.739	8.601
7.	6.	29	6	20.690	7.522
2.	10.	29	6	20.690	7.522
9.	2.	34	7	20.588	6.934
5.	2.	232	47	20.259	2.639
4.	9.	15	3	20.000	10.328

10.	11.	12	2	16.667	10.758
6.	3.	61	10	16.393	4.740
3.	7.	55	9	16.364	4.988
1.	4.	50	8	16.000	5.185
1.	2.	50	8	16.000	5.185
3.	5.	45	7	15.556	5.403
4.	2.	13	2	15.385	10.007
8.	1.	190	29	15.263	2.609
3.	8.	7	1	14.286	13.226
4.	13.	60	6	10.000	3.873
9.	1.	105	9	8.571	2.732
7.	2.	121	10	8.264	2.503
6.	1.	89	7	7.865	2.853
4.	1.	13	1	7.692	7.391
8.	3.	39	3	7.692	4.267
2.	9.	14	1	7.143	6.883
4.	3.	15	1	6.667	6.441
1.	3.	50	3	6.000	3.359
10.	19.	50	3	6.000	3.359
3.	1.	54	1	1.852	1.835
10.	35.	1	0	.000	.000
10.	25.	14	0	.000	.000
2.	3.	63	0	.000	.000
2.	14.	1	0	.000	.000
2.	4.	17	0	.000	.000
2.	12.	3	0	.000	.000
10.	29.	1	0	.000	.000
2.	11.	2	0	.000	.000
10.	27.	5	0	.000	.000
10.	31.	2	0	.000	.000
10.	28.	1	0	.000	.000
2.	13.	3	0	.000	.000
2.	8.	7	0	.000	.000
10.	30.	1	0	.000	.000
10.	8.	3	0	.000	.000
10.	24.	1	0	.000	.000
10.	7.	1	0	.000	.000
10.	6.	2	0	.000	.000
10.	5.	1	0	.000	.000
10.	4.	1	0	.000	.000
10.	10.	13	0	.000	.000
10.	2.	2	0	.000	.000
10.	12.	4	0	.000	.000
10.	13.	2	0	.000	.000
8.	9.	3	0	.000	.000
7.	1.	4	0	.000	.000
10.	14.	4	0	.000	.000
10.	17.	2	0	.000	.000
3.	6.	5	0	.000	.000

4.	11.	4	0	.000	.000
10.	22.	5	0	.000	.000
4.	9.	6	0	.000	.000
4.	8.	7	0	.000	.000
10.	18.	3	0	.000	.000
5.	3.	2	0	.000	.000
5.	1.	13	0	.000	.000
4.	5.	8	0	.000	.000
10.	30.	1	0	.000	.000

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ANALYSIS OF COUNTS FOR EACH LEVEL OF EACH FACTOR

THE NUMBER OF INPUT OBSERVATIONS IS 247
THE NUMBER OF INPUT FACTORS IS 10
INPUT ARGUMENT 8 = INPUT ARGUMENT 9 AND SO
ALL 247 OBSERVATIONS OF THE RESPONSE VECTOR WERE ANALYZED
THE INPUT RESPONSE INTERVAL OF INTEREST IS (1.000500, 200.000000)

THE TOTAL NUMBER OF OBSERVATIONS ANALYZED IS 247
THE TOTAL NUMBER OF OBSERVATIONS IN THE RESPONSE INTERVAL OF INTEREST IS 28
THE PERCENTAGE OF OBSERVATIONS IN THE RESPONSE INTERVAL OF INTEREST IS 11.336
THE STANDARD DEVIATION OF THIS PERCENTAGE VALUE IS 2.017

FACTOR-LEVEL DECOMPOSITION

FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE	*	FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE
1.	1.	49	8	16.327	5.280	*	1.	5.	48	8	16.667	5.379
1.	2.	50	5	10.000	4.243	*	1.	1.	49	8	16.327	5.280
1.	3.	50	2	4.000	2.771	*	1.	4.	50	5	10.000	4.243
1.	4.	50	5	10.000	4.243	*	1.	2.	50	5	10.000	4.243
1.	5.	48	8	16.667	5.379	*	1.	3.	50	2	4.000	2.771
						*						
2.	10.	29	4	13.793	6.403	*	2.	6.	6	5	83.333	15.215
2.	3.	63	0	.000	.000	*	2.	2.	10	3	30.000	14.491
2.	9.	14	0	.000	.000	*	2.	1.	80	15	18.750	4.364
2.	11.	2	0	.000	.000	*	2.	10.	29	4	13.793	6.403
2.	1.	80	15	18.750	4.364	*	2.	7.	9	1	11.111	10.476
2.	5.	3	0	.000	.000	*	2.	3.	63	0	.000	.000
2.	2.	10	3	30.000	14.491	*	2.	9.	14	0	.000	.000
2.	8.	7	0	.000	.000	*	2.	11.	2	0	.000	.000
2.	13.	3	0	.000	.000	*	2.	4.	17	0	.000	.000
2.	7.	9	1	11.111	10.476	*	2.	5.	3	0	.000	.000
2.	6.	6	5	83.333	15.215	*	2.	13.	3	0	.000	.000
2.	12.	3	0	.000	.000	*	2.	8.	7	0	.000	.000
2.	4.	17	0	.000	.000	*	2.	12.	3	0	.000	.000
2.	14.	1	0	.000	.000	*	2.	14.	1	0	.000	.000
						*						
3.	7.	55	5	9.091	3.876	*	3.	3.	13	6	46.154	13.826
3.	1.	54	0	.000	.000	*	3.	4.	44	9	20.455	6.081

3.	4.	44	9	20.455	6.081	*	3.	2.	24	4	16.667	7.607
3.	8.	7	1	14.286	13.226	*	3.	8.	7	1	14.286	13.226
3.	3.	13	6	46.154	13.826	*	3.	7.	55	5	9.091	3.876
3.	5.	45	3	6.667	3.718	*	3.	5.	45	3	6.667	3.718
3.	6.	5	0	.000	.000	*	3.	6.	5	0	.000	.000
3.	2.	24	4	16.667	7.607	*	3.	1.	54	0	.000	.000
						*						
						*						
4.	11.	4	0	.000	.000	*	4.	7.	25	10	40.000	9.798
4.	13.	60	5	8.333	3.568	*	4.	14.	29	6	20.690	7.522
4.	4.	34	3	8.824	4.864	*	4.	12.	5	1	20.000	17.889
4.	9.	6	0	.000	.000	*	4.	6.	15	2	13.333	8.777
4.	12.	5	1	20.000	17.889	*	4.	4.	34	3	8.824	4.864
4.	9.	7	0	.000	.000	*	4.	13.	60	5	8.333	3.568
4.	6.	15	2	13.333	8.777	*	4.	2.	13	1	7.692	7.391
4.	7.	25	10	40.000	9.798	*	4.	9.	6	0	.000	.000
4.	3.	15	0	.000	.000	*	4.	8.	7	0	.000	.000
4.	14.	29	6	20.690	7.522	*	4.	1.	13	0	.000	.000
4.	2.	13	1	7.692	7.391	*	4.	10.	13	0	.000	.000
4.	5.	8	0	.000	.000	*	4.	5.	8	0	.000	.000
4.	10.	13	0	.000	.000	*	4.	3.	15	0	.000	.000
4.	1.	13	0	.000	.000	*	4.	11.	4	0	.000	.000
						*						
						*						
5.	2.	232	28	12.069	2.139	*	5.	2.	232	28	12.069	2.139
5.	1.	13	0	.000	.000	*	5.	3.	2	0	.000	.000
5.	3.	2	0	.000	.000	*	5.	1.	13	0	.000	.000
						*						
						*						
6.	2.	97	21	21.649	4.182	*	6.	2.	97	21	21.649	4.182
6.	1.	89	3	3.371	1.913	*	6.	3.	61	4	6.557	3.169
6.	3.	61	4	6.557	3.169	*	6.	1.	89	3	3.371	1.913
						*						
						*						
7.	6.	29	4	13.793	6.403	*	7.	5.	21	8	38.095	10.597
7.	3.	49	5	10.204	4.324	*	7.	4.	23	4	17.391	7.903
7.	4.	23	4	17.391	7.903	*	7.	6.	29	4	13.793	6.403
7.	5.	21	8	38.095	10.597	*	7.	3.	49	5	10.204	4.324
7.	2.	121	7	5.785	2.122	*	7.	2.	121	7	5.785	2.122
7.	1.	4	0	.000	.000	*	7.	1.	4	0	.000	.000
						*						
						*						
8.	3.	39	2	5.128	3.532	*	8.	2.	3	3	100.000	.000
8.	1.	190	11	5.789	1.694	*	8.	4.	12	12	100.000	.000
8.	5.	3	0	.000	.000	*	8.	1.	190	11	5.789	1.694
8.	4.	12	12	100.000	.000	*	8.	3.	39	2	5.128	3.532
8.	2.	3	3	100.000	.000	*	8.	5.	3	0	.000	.000
						*						
						*						
9.	3.	67	15	22.388	5.093	*	9.	3.	67	15	22.388	5.093
9.	1.	105	4	3.810	1.868	*	9.	2.	34	6	17.647	6.538
9.	4.	41	3	7.317	4.067	*	9.	4.	41	3	7.317	4.067
9.	2.	34	6	17.647	6.538	*	9.	1.	105	4	3.810	1.868
						*						
						*						
10.	1.	32	3	9.375	5.153	*	10.	23.	2	2	100.000	.000
10.	2.	2	0	.000	.000	*	10.	3.	8	6	75.000	15.309
10.	3.	8	6	75.000	15.309	*	10.	34.	6	3	50.000	20.412

10.	4.	1	0	.000	.000	*	10.	26.	3	1	33.333	27.217
10.	5.	1	0	.000	.000	*	10.	9.	17	4	23.529	10.288
10.	6.	2	0	.000	.000	*	10.	32.	26	5	19.231	7.729
10.	7.	1	0	.000	.000	*	10.	20.	7	1	14.286	13.226
10.	8.	3	0	.000	.000	*	10.	1.	32	3	9.375	5.153
10.	9.	17	4	23.529	10.288	*	10.	11.	12	1	8.333	7.979
10.	10.	13	0	.000	.000	*	10.	19.	50	2	4.000	2.771
10.	11.	12	1	8.333	7.979	*	10.	14.	4	0	.000	.000
10.	12.	4	0	.000	.000	*	10.	13.	2	0	.000	.000
10.	13.	2	0	.000	.000	*	10.	2.	2	0	.000	.000
10.	14.	4	0	.000	.000	*	10.	12.	4	0	.000	.000
10.	15.	2	0	.000	.000	*	10.	7.	1	0	.000	.000
10.	16.	4	0	.000	.000	*	10.	4.	1	0	.000	.000
10.	17.	2	0	.000	.000	*	10.	10.	13	0	.000	.000
10.	18.	3	0	.000	.000	*	10.	5.	1	0	.000	.000
10.	19.	50	2	4.000	2.771	*	10.	6.	2	0	.000	.000
10.	20.	7	1	14.286	13.226	*	10.	8.	3	0	.000	.000
10.	21.	1	0	.000	.000	*	10.	15.	2	0	.000	.000
10.	22.	5	0	.000	.000	*	10.	16.	4	0	.000	.000
10.	23.	2	2	100.000	.000	*	10.	35.	1	0	.000	.000
10.	24.	1	0	.000	.000	*	10.	33.	7	0	.000	.000
10.	25.	14	0	.000	.000	*	10.	31.	2	0	.000	.000
10.	26.	3	1	33.333	27.217	*	10.	30.	1	0	.000	.000
10.	27.	5	0	.000	.000	*	10.	29.	1	0	.000	.000
10.	28.	1	0	.000	.000	*	10.	28.	1	0	.000	.000
10.	29.	1	0	.000	.000	*	10.	27.	5	0	.000	.000
10.	30.	1	0	.000	.000	*	10.	25.	14	0	.000	.000
10.	31.	2	0	.000	.000	*	10.	17.	2	0	.000	.000
10.	32.	26	5	19.231	7.729	*	10.	36.	1	0	.000	.000
10.	33.	7	0	.000	.000	*	10.	21.	1	0	.000	.000
10.	34.	6	3	50.000	20.412	*	10.	22.	5	0	.000	.000
10.	35.	1	0	.000	.000	*	10.	24.	1	0	.000	.000
10.	36.	1	0	.000	.000	*	10.	18.	3	0	.000	.000
						*						
						*						

MOST SIGNIFICANT LEVEL OF EACH FACTOR

FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE
1	5.	48	8	16.667	5.379
2	6.	6	5	83.333	15.215
3	3.	13	6	46.154	13.826
4	7.	25	10	40.000	9.798
5	2.	232	28	12.069	2.139
6	2.	97	21	21.649	4.182
7	5.	21	8	38.095	10.597
8	2.	3	3	100.000	.000
9	3.	67	15	22.388	5.093

10	23.	2	2	100.000	.000

ORDERING OF FACTOR-LEVEL COMBINATIONS

FACTOR	LEVEL	NUMBER OF OBS. AT THIS LEVEL OF THIS FACTOR	NUMBER OF OBS. IN RESPONSE INTERVAL	PERCENTAGE OF OBS. IN RESPONSE INTERVAL	ESTIMATED STANDARD DEVIATION OF PERCENTAGE
9.	2.	3	3	100.000	.000
9.	4.	12	12	100.000	.000
10.	23.	2	2	100.000	.000
2.	6.	6	5	83.333	15.215
10.	3.	8	6	75.000	15.309
10.	34.	6	3	50.000	20.412
3.	3.	13	6	46.154	13.926
6.	7.	25	10	40.000	9.799
7.	5.	21	8	38.095	10.597
10.	26.	3	1	33.333	27.217
2.	2.	10	3	30.000	14.491
10.	9.	17	4	23.529	10.289
8.	3.	67	15	22.389	5.093
6.	2.	97	21	21.649	4.183
4.	14.	29	6	20.690	7.523
7.	4.	44	9	20.455	6.081
4.	12.	5	1	20.000	17.889
10.	32.	26	5	19.231	7.729
2.	1.	80	15	18.750	4.364
9.	2.	34	6	17.647	6.538
7.	4.	23	4	17.391	7.903
1.	5.	48	8	16.667	5.379
3.	2.	24	4	16.667	7.607
1.	1.	49	8	16.327	5.289
3.	8.	7	1	14.286	13.226
10.	20.	7	1	14.286	13.226
7.	6.	29	4	13.793	6.403
2.	10.	29	4	13.793	6.403
4.	6.	15	2	13.333	8.777
5.	2.	232	28	12.069	2.139
2.	7.	9	1	11.111	10.476
7.	5.	49	5	10.204	4.324
1.	2.	50	5	10.000	4.243
1.	4.	50	5	10.000	4.243
10.	1.	32	3	9.375	5.153
3.	7.	55	5	9.091	3.976
4.	4.	34	3	8.824	4.864
10.	11.	12	1	8.333	7.979
4.	13.	60	5	8.333	3.568
4.	2.	13	1	7.692	7.391

9.	4.	41	3	7.317	4.067
3.	5.	45	3	6.667	3.718
6.	3.	61	4	6.557	3.169
8.	1.	100	11	5.789	1.694
7.	2.	121	7	5.785	2.122
8.	3.	39	2	5.128	3.539
10.	10.	50	2	4.000	2.771
1.	3.	50	2	4.000	2.771
9.	1.	105	4	3.810	1.869
6.	1.	89	3	3.371	1.913
2.	4.	17	0	.000	.000
2.	14.	1	0	.000	.000
10.	25.	14	0	.000	.000
3.	1.	54	0	.000	.000
10.	27.	5	0	.000	.000
10.	24.	1	0	.000	.000
2.	12.	3	0	.000	.000
10.	28.	1	0	.000	.000
10.	35.	1	0	.000	.000
10.	33.	7	0	.000	.000
2.	3.	63	0	.000	.000
2.	9.	14	0	.000	.000
2.	11.	2	0	.000	.000
10.	31.	2	0	.000	.000
2.	5.	3	0	.000	.000
10.	30.	1	0	.000	.000
10.	4.	1	0	.000	.000
2.	8.	7	0	.000	.000
2.	13.	3	0	.000	.000
10.	29.	1	0	.000	.000
3.	6.	5	0	.000	.000
10.	22.	5	0	.000	.000
4.	11.	4	0	.000	.000
10.	14.	4	0	.000	.000
10.	13.	2	0	.000	.000
10.	12.	4	0	.000	.000
7.	1.	4	0	.000	.000
9.	5.	3	0	.000	.000
10.	10.	13	0	.000	.000
10.	8.	3	0	.000	.000
10.	7.	1	0	.000	.000
10.	6.	2	0	.000	.000
10.	2.	2	0	.000	.000
10.	5.	1	0	.000	.000
10.	15.	2	0	.000	.000
5.	3.	2	0	.000	.000
4.	9.	6	0	.000	.000
10.	21.	1	0	.000	.000
4.	8.	7	0	.000	.000

10.	18.	3	0	.000	.000
4.	3.	15	0	.000	.000
10.	17.	2	0	.000	.000
4.	5.	8	0	.000	.000
5.	1.	13	0	.000	.000
10.	15.	4	0	.000	.000
4.	1.	13	0	.000	.000
4.	10.	13	0	.000	.000
10.	36.	1	0	.000	.000

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5. Publication Date

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7. AUTHOR(S)

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8. Performing Organization

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14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)

Lead in paint has been indicted as a major cause of lead poisoning of children. Federal regulations have been established to limit the amount of lead which may be added to paints that are intended for residential use. The intent of such a limitation is to curtail the incidence of present and future lead based paint poisoning of children.

This report presents the results of a "pre-test" for a nation-wide survey plan that would be used to determine the availability, to the public, of paints that may contain lead compounds in hazardous quantities. Statistical summaries of the chemical analysis of 250 paints purchased by random selection at five retail outlets, are presented along with comments regarding the possible implications of those results. Recommendations are made about survey action beyond the pre-test described herein.

17. KEY WORDS (Alphabetical order, separated by semicolons)

Lead; lead paint poisoning; paints; poisoning; retail inventory; statistics; survey

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