ORIGINAL

BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268–0001

SPECIAL SERVICES REFORM, 1996

Docket No. MC96–3

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS ELLARD TO INTERROGATORIES OF THE OFFICE OF THE CONSUMER ADVOCATE (OCA/USPS–T6—21-24)

The United States Postal Service hereby provides responses of witness Ellard to the following interrogatories of the Office of the Consumer Advocate: OCA/USPS–T6—21-24, filed on July 23, 1996.

Each interrogatory is stated verbatim and is followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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August 6, 1996

OCA/USPS-T6-21. Please refer to your response to OCA/USPS-T6-1.

a. In your response to part "e", you referred to the postmaster's instructions as "one possible reason that the cards should not be placed in a cluster." Please explain other possible reasons that cards should not be placed in a cluster.

b. In your response to part "f", you stated that postmasters were not asked to return calculations of placement intervals to Opinion Research Corporation. Please explain how you could check that this aspect of sampling was performed correctly in the absence of this data.

RESPONSE to OCA/USPS-T6-21.

a. The principal reason that cards should not be placed in a cluster is that a cluster might share non-random characteristics, with emphasis on the words might and non-random. We generally try to avoid clustering when practical although economic considerations may lead us to employ some clustering.

Two hypothetical situations that reflect problems attributable to cluster effects would be:

-- A business with multiple boxes might have a number of boxes within a cluster.
-- If boxes were assigned by a non-random scheme (e.g., alphabetically) we could encounter non-random clustering.

b. We did not make provision to check this aspect of sampling. Our first objective was not to perfect our sample, but to make the process a simple and reasonable one. See my response to OCA/USPS-T6- 3d.

OCA/USPS-T6-22. Please refer to your response to OCA/USPS-T6-2.

a. Would your response to part "d" change if the reference to box holders was removed from the question? Can you confirm that post office boxes with the lowest and highest box numbers have a greatly reduced (or zero) chance of selection as compared to the rest of the boxes at this location? If you do not confirm, please explain.

b. Please refer to your response to part "e." Could non-integral sampling intervals and a random starting box selection have avoided the problem of excluding the first and last group of boxes from sample? Please explain.

RESPONSE to OCA/USPS-T6-22.

a. Yes, I would confirm the revised statement.

b. Non-integral sampling intervals and a random starting box selection could have avoided the problem of excluding the first and last group of boxes from the sample. However, that much more complex approach could easily have introduced more detrimental bias such as the lack of cooperation of selected post offices.

OCA/USPS-T6-23. Please refer to your response to OCA/USPS-T6-3.

a. In reference to part "e" of your response, please provide a citation to the portion of your testimony that describes how post-stratification compensates for potential bias. If this is accomplished in your estimation programs, please provide a reference to the section of the computer code that makes this adjustment.

b. Please refer to your response to part "g." Suppose that the 73 box holders were randomly distributed to 73 post office boxes. If this were the case, then would the first 25 boxes provide a random sample of box holders? Please explain.

RESPONSE to OCA/USPS-T6-23.

a. The second stage weighting discussed in lines 17-24 of page 6 of my Testimony is a brief description of post stratification.

Generally, post stratification is used as a means of reducing the effects of non-response and of frame inadequacies. The exclusion of some low and high box numbers from this sample is a frame inadequacy.

While the weighting process has been discussed at length in the USPS Library Reference SSR-111 at and in a number of Interrogatories and Responses, we have not provided computer code for the process. The computer code for post stratification will be submitted in USPS Library Reference SSR-133, Box Price Sensitivity Study, Post Stratification Documentation, Provided in Response to OCA/USPS-T6-23.

b. Yes. If the sample is truly random, then any subset is random.

OCA/USPS-T6-24. Please refer to your response to OCA/USPS-T6-5.

a. In your response to part "b," please confirm that the formula at the top of page 53 of SSR-111 should have D^*_{rbz} in place of D_{rbt} and that "z" should appear as a subscript for F, on the left-hand side of the formula. If you do not confirm, please explain.

b. In response to part "d," you state, "Cross-examination of weights was done after computation of weights. This manual process has nothing to do with the referenced formula." Please describe this "cross-examination" process and any specific changes to weighting factors that were made as a result of this process.

c Please refer to your response to part "e." The formula at the top of page 53 of SR-111 (when modified as suggested in your response to OCA/USPS-T6-5.b.) appears to depend on the trimmed design weight for the z-th PSU. Please explain why the final weights do not depend on the selection probabilities, P_{rz}. Please explain how post-stratification eliminates the need to use PSU sample selection probabilities to produce valid estimates.

RESPONSE to OCA/USPS-T6-24.

a. This is not confirmed. While the probability of box selection, P_{rz}, directly depends on *z*, the final weights do not directly depend on *z*. Final weights were calculated within post-strata defined by tier and box size. That is, the final weight for the *r*-f responding renter of the *b*-th box size in the *t*-th tier, F_{rbt}, was calculated by:

$$F_{rbt} = D_{rbt} \times \frac{B_{bt}}{\sum_r D^*_{rbt}}$$

b. Cross-examination of weights is merely a quality control step, aiming to identify erroneous outliers. No specific changes were made to final weights as a result of this examination.

c. This question seems to be much the same as that asked in OCA/USPS-T6-5.a. Please see that Interrogatory and my Response. Final weights do depend on the selection probabilities through design weights. I have never said that post-stratification eliminates the need to use PSU sample selection probabilities to produce valid estimates. But there seems to be some confusion as to when and how they are used.

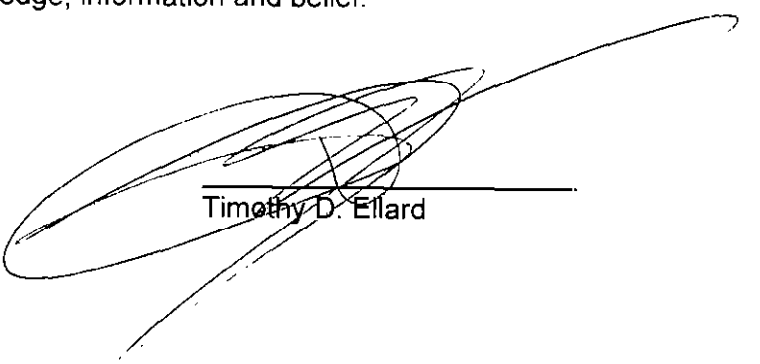
In an attempt to put this subject to rest, I'll use an analogy. First, please refer to the brief discussion of weighting in my Testimony (USPS-T-6) at 6 and the more technical discussion in USPS Library Reference SSR-111 at 50.

In my Testimony I described two stages of weighting. The balance of the discussion in the Testimony is less detailed than that in the Library Reference. The probability of selecting a PSU is a key part of the first stage as are the probabilities of selecting a box and the response rate for each sample cell. When we have completed these steps, we apply the second stage weights. The first stage might be compared to a first stage in mixing paint. Let's start with brown, black and white to make tan. Brown, black and white are analogousto the various selection probabilities and tan is the result of the first stage weighting.

Now, let's assume we wish to add some pink to produce a shade of beige. We add the pink to the tan, not to separate elements of brown, black and white. This is parallel to the process of post stratification which is done after the first weighting stage is completed. While there might be algebraic justification in a notation that shows this all taking place in one step, that notation would not be true representation of the process.

DECLARATION

I, Timothy D. Ellard, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information and belief.



Timothy D. Ellard

Dated: Aug 6, 1996

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the Rules of Practice.

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