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Subject: Audience Segmentation for the 2010 Census
Communication Campaign: Findings from the 2008 Dress
Rehearsal

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Attached is the C2PO 2010 Census Integrated Communications Research of Segmentation for the 2010 Census Communication Campaign: Finding from the 2008 Dress Rehearsal. This research summarizes mail response data from the 2008 Census Dress Rehearsal as it relates to an audience segmentation framework being applied to the 2010 Census Communication Campaign. The 2010 framework assign each census tract into one of eight distinct clusters that vary in terms of size, geographic location, socioeconomic characteristics and Census 2000 mailback propensity.

Attachment

Audience Segmentation for the 2010 Census Communication Campaign:
Findings from the 2008 Dress Rehearsal

Nancy Bates, Census 2010 Publicity Office
October 9, 2008

Introduction

The purpose of this report is to summarize mail response data from the 2008 Census Dress Rehearsal (DR) as it relates to an audience segmentation framework being applied for the 2010 Census communications campaign. The 2010 framework assigns each census tract into one of eight distinct clusters that vary in terms of size, geographic location, socioeconomic characteristics and Census 2000 mailback propensity (see Bates and Mulry, 2007). Typical characteristics of the eight clusters (at the national level) are summarized below:

- *All Around Average I (homeowner skewed)* – Average poverty, education, mobility and education; $\frac{3}{4}$ homeowners; cluster with largest % rural tracts; 80% white. Census 2000 mail response=66%. Comprises 35% of occupied housing units.
- *All Around Average II (renter skewed)* – Average poverty, education, mobility and education; skews renters in multi-units; urban; 69% white. Census 2000 mail response=66%. Comprises 16% occupied housing units.
- *Economically Disadvantaged I (homeowner skewed)* – High poverty, public assistance, unemployment; $\frac{1}{2}$ homeowners, skews female-headed households; central cities and rural; 49% black, 37% white. Census 2000 mail response=55%. Comprises 6% of occupied housing units.
- *Economically Disadvantaged II (renter skewed)* - High poverty, public assistance, unemployment; renters in multi-units, non-spousal female headed households; very urban; 59% black. Census 2000 mail response rate=48%. Comprises 3% of occupied housing units.
- *Ethnic Enclave I (homeowner skewed)*- Crowded housing; high poverty, low education, mostly spousal households, high number of children, linguistic isolation; 61% Hispanic. Census 2000 mail response rate=60%. Comprises 3% of occupied housing units.
- *Ethnic Enclave II (renter skewed)*- Crowded housing; high poverty, low education; linguistic isolation, urban, 59% Hispanic; 11% Asian. Census 2000 mail response rate=57%. Comprises 3% of occupied housing units.

- *Single/Mobiles* – skews non-spousal renters in multi-units with high mobility. Above average education. Racially diverse; urban. Census 2000 mail response rate=59%. Comprises 8% of occupied housing units.
- *Advantaged Homeowners*: Mostly single family home-owners containing married couples; low mobility; suburban; 85% White. Census 2000 mail response =75%. Comprises 26% of occupied housing units.

The cluster analysis was based upon the tract-level Census 2000 Planning database (PDB) and was independent of any DR plans or activities. The PDB is a tract-level database based on Census 2000 data that assembles a range of housing, demographic, and socioeconomic variables correlated with Census nonresponse and undercounted populations (see Bruce and Robinson, 2001 at <http://www.census.gov/procur/www/2010communications/library.html>).

The DR analysis addresses several research questions related to the segmentation framework. For example, was mailback behavior by cluster in the DR as expected? To what degree did clusters predicted to contain linguistically isolated households fall into DR areas flagged to receive a Spanish-language form? What was the impact of the replacement forms across the eight clusters? How did mailback behavior and socioeconomic characteristics vary between clusters across DR sites? Answers to these questions help inform the 2010 Integrated Communications Plan and application of the audience segmentation to the paid advertising and partnership campaign.

The Census Bureau conducted the 2008 Census DR in two sites: San Joaquin county, California and the city of Fayetteville, North Carolina and the nine-county surrounding region. San Joaquin was selected as one of the sites primarily because it is an urban area with a multilingual population. The city of Fayetteville and the surrounding areas was selected primarily because it is a mix of urban, suburban, and rural areas. The 2008 DR operations were scaled back due to budget constraints as the result of a continuing resolution (Vitran, 2007) but both sites employed a DR form mailout/mailback. Daily mail response rates were captured in reports generated by the internal Response Rate Feedback portal. Mail response rates represent the percentage of mail-eligible households that return a form divided by the total number of mail-eligible households. This metric includes vacant units and units designated as undeliverable as addressed (or UAA). Consequently, if a tract has a high number of UAAs and/or vacant units, the mail response rate suppresses the true level of mail cooperation.

DR mailout was April 14-16, 2008 and Census Day was May 1st, 2008. According to the Response Rate Feedback report for June 30, 2008 (which included check-ins up to and including the weekend of 6/28-6/29¹), the mail response rates by site were:

¹ Form check-in to the Cost and Progress system continued for several weeks beyond 6/30. For purposes of this report, the number of forms received after 6/30 were small enough not to change any inferences or conclusions. Later memos that officially document the mail response rates for Dress Rehearsal will include the later mail returns.

San Joaquin County: 44.6%
 North Carolina site: 43.8%

Assigning Clusters to the DR Sites

In order to track mail response behavior by cluster, we first identified the DR tracts to produce a distribution of clusters by site (see table 1).

Table 1. Distribution of 2008 DR tracts by Census 2010 Audience Segmentation Clusters

Cluster	San Joaquin county tract distribution	Fayetteville area tract distribution
All around average I (homeowner skewed)	27.7% (33)	60.3% (70)
All around average II (renter skewed)	9.2% (11)	12.9% (15)
Econ. Disadvantaged I (homeowner skew)	9.2% (11)	14.7% (17)
Econ. Disadvantaged II (renter skewed)	1.7% (2)	1.0% (1)
Ethnic Enclave I (homeowner skewed)	21.9% (26)	1.7% (2)
Ethnic Enclave II (renter skewed)	6.7% (8)	0% (0)
Single Mobiles	3.4% (4)	1.0% (1)
Advantaged homeowners	20.2% (24)	8.6% (10)
N (tracts)	119	116

Together, the DR covered 242 tracts (121 tracts in each site). However, 2 tracts in San Joaquin and 5 in North Carolina did not match back to a cluster assignment. These are tracts denoted in the 2000 Planning Database as “nonrepresentative” meaning they contained a very high percentage of group quarters population, had high vacancy rates, or were very sparsely populated tracts in 2000. Since nonrepresentative tracts were excluded when forming the clusters, these 7 tracts are excluded from the mail response cluster analysis of this report.

As might be expected, the distribution of clusters varied greatly by site. The North Carolina site was predominately All Around Average I – homeowner skewed (60%) with no Ethnic Enclave II tracts and very few tracts in the Economically Disadvantaged II, Single Mobile, or Ethnic Enclave I clusters. Conversely, the San Joaquin site was much more dispersed. Over one-quarter (28%) of tracts fell into the All Around Average I, just under one-quarter (22%) in the Ethnic Enclave II, 20% in the Advantaged Homeowner cluster and 9% each in All Around Average II and Economically Disadvantaged I.

Spanish Assistance Tracts

In both sites, areas found to have a high percentage of Spanish linguistic isolation in Census 2000 were flagged to receive a bilingual Spanish/English form². In San Joaquin County, 27 tracts had some or all addresses flagged to receive a Spanish form while in North Carolina, only 2 tracts were designated as such. Because so few tracts in North Carolina were Spanish Assistance, we exclude that site from the following analysis.

In a previous check of the 2010 communication campaign clusters against areas designated to receive a bilingual form in Census 2010, Bentley (2008) reported a large percentage of 2010 bi-lingual stratification tracts falling into two clusters identified for the 2010 campaign. About 4 in 5 of tracts assigned to either the Ethnic Enclave I or II clusters were also classified as Spanish bi-lingual form tracts. The designation of bi-lingual tracts for 2010 was based upon information from the 2005 and 2006 ACS. For DR, areas designated to receive the bi-lingual form were based upon Census 2000 sample data. Consequently, this provided a second opportunity to cross-check how well the campaign clusters match up against operational data regarding where bi-lingual Spanish forms will be mailed. Table 2 presents a crosstabulation of the campaign clusters against tracts designated to receive a bi-lingual form in the San Joaquin DR site.

² Although tracts were used to initially select areas for Spanish Assistance, because of operational constraints sites were designated using data drawn from Census blocks. Consequently, it was possible that not all addresses within a tract were mailed the bilingual form.

Table 2. Bi-lingual form assignment by 2010 communication clusters –
San Joaquin County

Cluster	Bi-lingual Tract?
	Yes
All Around Average I	4% (1)
All Around Average II	0% (0)
Econ Disadvantaged I	0% (0)
Econ Disadvantaged II	4% (1)
Ethnic Enclave I	78% (21)
Ethnic Enclave II	15% (4)
Single Mobiles	0% (0)
Advantaged Homeowners	0% (0)
Total bi-lingual tracts (N)	100% (27)

Of the 27 tracts containing blocks assigned to receive bi-lingual forms in San Joaquin, 25 (93%) also fell into tracts assigned to one of the Ethnic Enclave clusters.

Response rates by Cluster

Figures 1 and 2 display the mail response rates by cluster by site as of 6/30/08³ compared to the short form mail response rates from Census 2000. One research question to be answered from DR was whether the cluster mailback behavior would follow a pattern similar to that in Census 2000. Five of the clusters (Econ. Disadvantaged I & II, Ethnic Enclave I and II, and Single Mobiles) had mailback rates below average in Census 2000.

As expected, the DR rates for all eight clusters in both sites were well below the short form mail response rates in Census 2000 (which reflect influences of the paid advertising campaign, grass-roots partnership program, and decennial Census “environment”). While

³ The 6/30 report date from the response rate feedback portal includes all check-ins up to and including the weekend of 6/28-6/29.

the DR received some amount of media coverage and had a small Partnership program presence, it drew much less attention and had no paid advertising compared to 2000. Consequently, lower rates were expected. In fact the gap between DR and Census 2000 for all clusters was quite large -- between 16-27 percentage points. The lower-than-expected mail response in the DR may have been due, in part, to the decision to cancel the nonresponse follow-up operation. This operation would have sent enumerators door-to-door to personally count households that failed to mail back a form by the prescribed cut-off date. Some hypothesize that media surrounding the decision to cancel this operation led some households to believe the entire DR had been cancelled, thus completing and mailing back the form were no longer required. In both sites the largest gap between 2000 and the DR was for Ethnic Enclave I (27% in San Joaquin and 22% in Fayetteville area). Perhaps evidence that this cluster was motivated in particular to mail back a Census 2000 form as a result of the ad campaign and partnership activities.

In both sites, several of the clusters expected to have the lowest mailback rates, indeed did. In San Joaquin, this was true for the Economically Disadvantaged II and both Ethnic Enclave groups. In North Carolina, mail response rates for the Economically Disadvantaged II, Ethnic Enclave I and the Mobile Single clusters were noticeably below average. Conversely, in both sites, the Advantaged Homeowner and All Around Average I clusters had the highest mail response rates. One unexpected result was the Economically Disadvantaged I cluster in San Joaquin with an above average mail response rate in the DR of 45%. However, the mail response rate for this cluster in Census 2000 was also unusually high (70%) so perhaps the finding is not so surprising.

Figure 1.

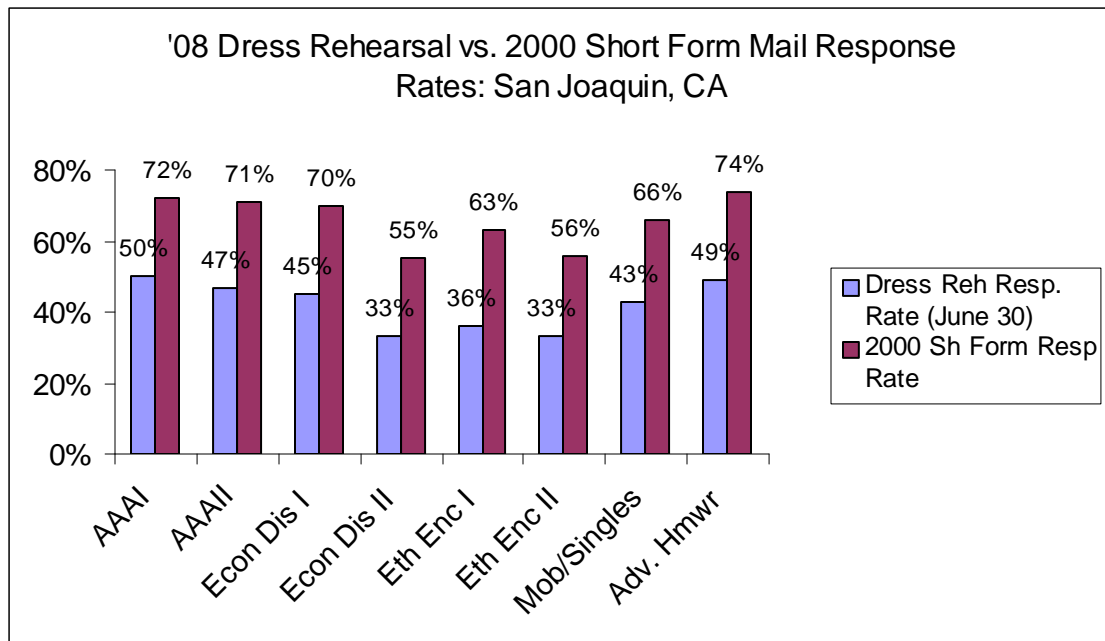
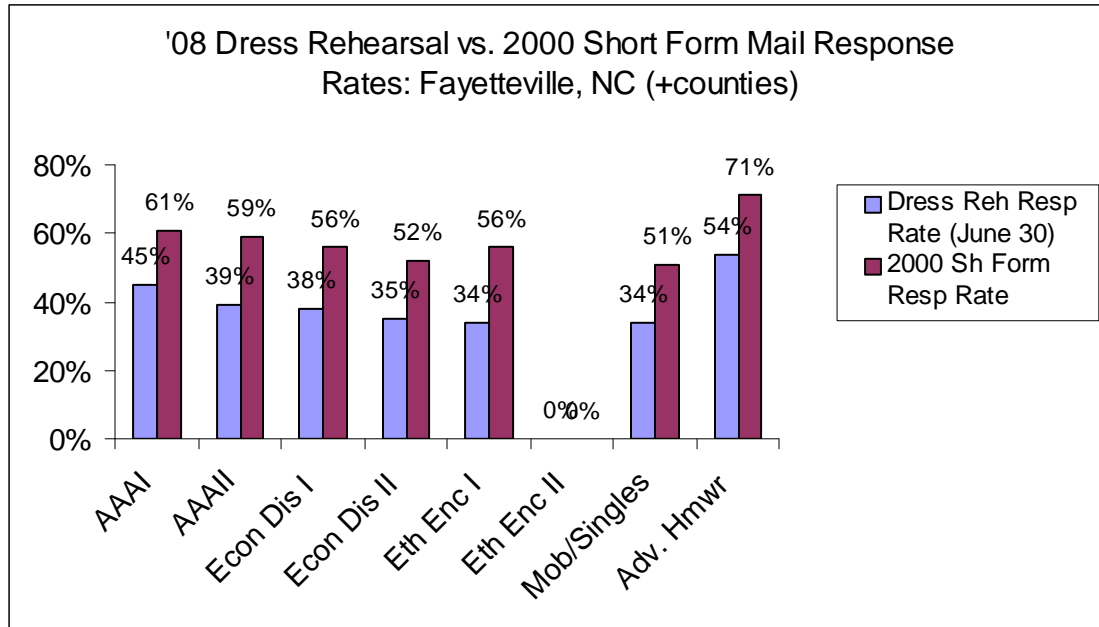


Figure 2.



Replacement forms

In the DR, targeted replacement forms were mailed to all households who hadn't responded as of May 2nd. Figures 3-4 breakout each cluster's total mail response by whether response was via the initial or replacement form. Previous analysis of ACS mailback behavior by cluster performed by Jacobsen (2008) indicates that the majority of mail returns for some clusters tend to occur after the replacement form has been delivered. This was found to be true for the Ethnic Enclave and Economically Disadvantaged clusters.⁴

⁴ This analysis tracked "early" vs. "late" mail returns with late returns defined as any return from the targeted replacement mailing pool regardless if the physical form was the initial or replacement form. Conversely, in DR, forms were checked-in according to form type (initial or replacement form) regardless of date received.

Figure 3.

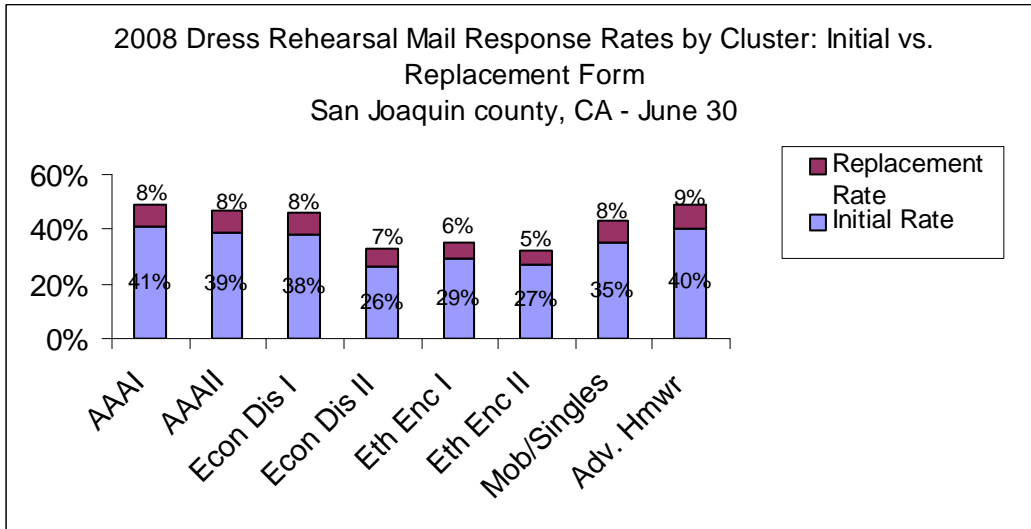
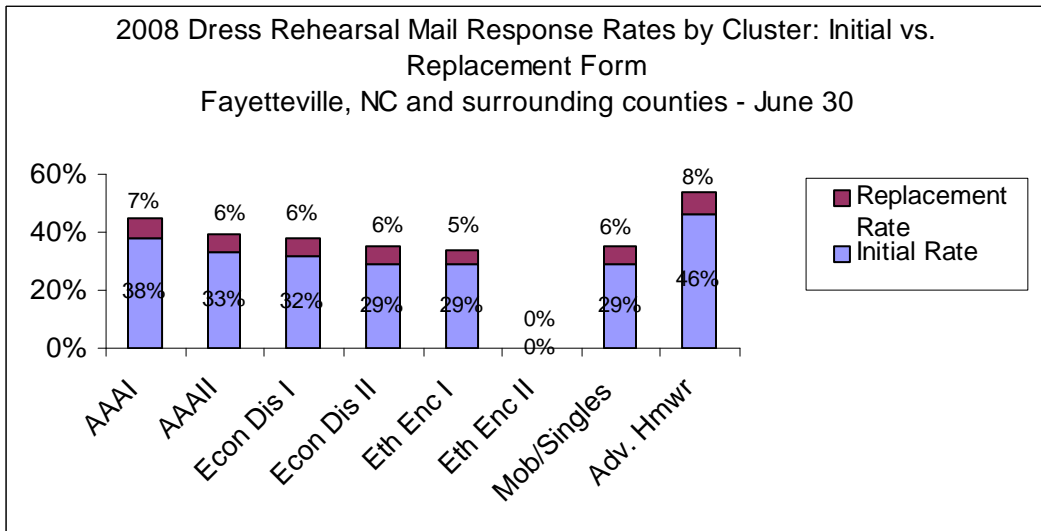


Figure 4.

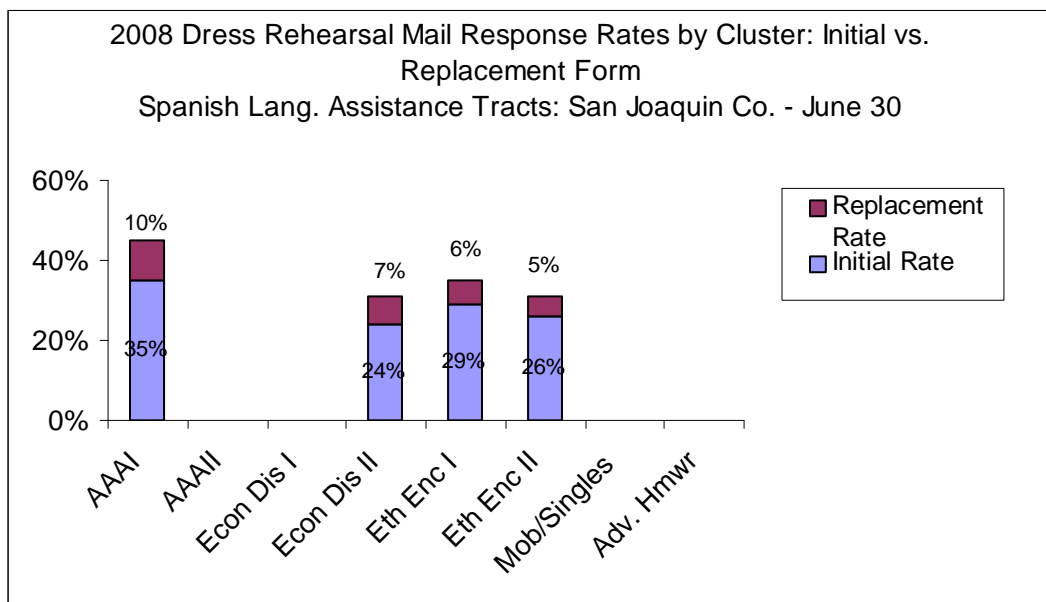


Data from Figures 3 and 4 suggest amazingly similar replacement form patterns across all eight clusters in both sites. Replacement forms accounted for between 5-9% of total mail response with some of the highest mail response clusters gaining the largest “lift” from replacement forms. This suggests that no matter what the mailback propensity to begin with, replacement forms had a substantial across-the-board desired effect. However, because we expect much higher initial mailback rates in the 2010 Census (due to paid advertising, partnership activities, media coverage, etc.), we cannot be certain the impact of the replacement mailing will be identical to that observed in the Dress Rehearsal.

Further, the implementation of the replacement form has been scaled back for the 2010 Census⁵.

Figure 5 illustrates mail response subset to the bi-lingual tracts in San Joaquin. In the DR, Spanish Assistance areas were mailed English-only replacement forms. Consequently, it is interesting to note that the “lift” rates in these areas are quite similar to the non-Spanish assistance areas (note: only 1 tract in the All Around Average I cluster was flagged as a Spanish Assistance area). Apparently, the positive impact of the replacement form prevailed regardless of language.

Figure 5.



ACS Characteristics by Cluster by Site

A final step toward leveraging information from the DR was to produce householder characteristics by cluster and site using data from the 2006 American Community Survey (ACS). Data from 14,250 2006 ACS households residing in 2008 DR tracts were identified by tract and assigned to a cluster. This represents a sample of the DR area households. Some selected characteristics gathered in the ACS are shown in Tables 3-4. This helps highlight both similarities and differences between clusters by site but are presented for *descriptive* purposes only. We have not calculated standard errors around the estimates and do not attempt to make statistical tests between the sites.

⁵ According to the 2010 Census Replan, only selected households will receive a targeted replacement form in 2010. Areas designated as historically “low mail response” will receive a blanket replacement form, areas with “middle mail response” will receive a targeted replacement, and areas in historically “high mail response” will receive no replacement form.

Table 3. Characteristics of Reference Person: 2006 ACS from 2008 DR Sites (weighted %s)

	Fayetteville NC and surrounding counties						
	Avg. I	Avg. II	Econ. Dis I	Econ. Dis II	Eth. Encl. I	Mobile/ singles	Adv. Home
Age							
< 25	5%	13%	7%	***	5%	17%	3%
25-34	18%	25%	18%	***	18%	23%	13%
35-44	22%	20%	15%	***	13%	13%	22%
45-54	20%	17%	21%	***	20%	26%	21%
55-64	16%	12%	16%	***	19%	7%	18%
65+	19%	14%	21%	***	26%	14%	24%
Race							
White	69%	61%	39%	***	60%	31%	71%
Black	24%	30%	52%	***	25%	64%	23%
Hispanic Origin							
Yes	4%	6%	7%	***	25%	***	5%
Linguistic Isolation							
Yes	1%	2%	3%	***	16%	***	1%
Mode of ACS Response							
Mail	51%	47%	41%	37%	53%	31%	62%
Foreign Born							
Yes	4%	7%	7%	***	24%	***	4%
Lang. Spoken at Home							
English only	91%	85%	91%	***	79%	***	87%
Spanish	5%	8%	8%	***	20%	***	7%
Mean HH income (rounded)	\$50,000	\$46,600	\$36,300	\$13,700	\$40,400	\$30,700	\$68,400

** cell size too small to show

Table 4. Characteristics of Reference Person: 2006 ACS from 2008 DR Sites (weighted %s)

	San Joaquin County							
	Avg. I	Avg. II	Econ. Dis I	Econ. Dis II	Eth. Encl. I	Eth. Encl. II	Mobile/singles	Adv. Home
Age								
< 25	3%	7%	7%	17%	5%	9%	17%	2%
25-34	16	20	20	20	21	23	26	19
35-44	22	23	19	12	22	22	14	28
45-54	24	19	19	24	19	19	15	24
55-64	18	12	14	11	16	9	12	14
65+	18	18	21	16	18	17	17	13
Race								
White	73%	76%	72%	58%	61%	59%	64%	67%
Black	5%	5%	7%	26%	10%	15%	10%	8%
Asian	12%	7%	11%	10%	13%	14%	15%	15%
Hispanic Origin								
Yes	19%	24%	33%	30%	51%	39%	20%	20%
Linguistic Isolation								
Yes	7%	8%	10%	16%	23%	20%	6%	6%
Mode of ACS Response								
Mail	53%	48%	40%	37%	33%	28%	47%	52%
Foreign Born								
Yes	21%	20%	24%	33%	31%	36%	19%	28%
Lang. Spoken at Home								
English only	69%	74%	65%	60%	43%	58%	72%	64%
Spanish	16%	17%	26%	25%	44%	27%	13%	16%
Asian language	8%	5%	7%	11%	10%	11%	7%	13%
Mean HH income (rounded)	\$73,500	\$57,400	\$45,200	\$30,000	\$46,200	\$35,300	\$43,300	\$84,300

For example, the Economically Disadvantaged I cluster in San Joaquin County looks very different from the same cluster in North Carolina. The household age distributions are fairly similar but the race and ethnic compositions are not. In North Carolina, householders in this cluster are majority Black (52%) while in San Joaquin, we see one-third Hispanic and 11% Asian with a sizable percent of householders who are foreign born (24%) and speak a language other than English at home (35%). The mean household income is almost \$10,000 above that of the same cluster in North Carolina. Given that many of the characteristics for this cluster in San Joaquin are commonly associated with

hard to count populations, it is noteworthy this cluster's mail response in DR was above average for San Joaquin and well above the same cluster in North Carolina (45% vs. 38%, respectively). The proportion mailing back the 2006 ACS form (a form roughly equivalent to the 2000 census "long" form) were similar across the two clusters (40-41%) making the higher than expected mail DR response rate in San Joaquin all the more puzzling. But, in fact, many of the cluster mail response rates in Fayetteville lagged behind those of San Joaquin. One reason could be a relatively higher vacancy rate in the NC site compared to San Joaquin – according to the 2006 American Community Survey, the vacancy rate for Fayetteville was approximately 11% compared to only 6% in San Joaquin county. Since vacant units are included in the denominator of the mail response rate, tracts with a large number of vacants will have somewhat deflated mail response rates. One exception was the Advantaged Homeowner cluster where over half in the Fayetteville site (54%) mailed back compared to just under half in San Joaquin (49%). This might be attributed to age distribution differences – 42% of the Advantaged Homeowners householders in North Carolina were 55 or older compared to only 27% in San Joaquin.

Conclusions

Was the mail response behavior of the clusters in the 2008 Dress Rehearsal as expected?

In general, clusters expected to have below average mail response and those expected to have above average response acted accordingly in the Dress Rehearsal. In San Joaquin, the Economically Disadvantaged (renter skewed) and both Ethnic Enclave clusters had far below average mail response while the Mobile Single cluster was just under average. In North Carolina, all clusters expected to have below average mail response did so including: both Economically Disadvantaged clusters, both Ethnic Enclave clusters and the Mobile Single group. Overall, then, the segmentation was an accurate predictor of mail response behavior. We remind readers that the Dress Rehearsal sites represent only two areas of the country and were selected for their unique characteristics. For this reason, we might expect results to vary somewhat from indicators based on all tracts in the U.S.

Did the Spanish Assistance areas in the Dress Rehearsal align as expected with the clusters thought to contain linguistically isolated populations?

Because only 2 tracts in North Carolina were flagged to receive Spanish Assistance forms, we limited the analysis to San Joaquin where 27 tracts were flagged. Of those 27 tracts, 25 (93%) were assigned to either the Ethnic Enclave I or II clusters. Since these clusters are characterized as containing a high percentage of Hispanic and linguistically isolated populations, we conclude that the clusters aligned as expected.

What was the impact of replacement forms in Dress Rehearsal across clusters?

In Dress Rehearsal, the impact of the targeted replacement form was measured by the percent of actual replacement forms mailed back. Across all eight clusters, the

percentage of mail response comprised of second forms was very encouraging (and fairly consistent). In each site, the largest “lift” was for the Advantaged Homeowner cluster. If the Dress Rehearsal is any indication, this finding is noteworthy because this cluster represents over one-quarter of occupied housing units nationally. However, in the current Census 2010 Replan, areas designated as historically “high” mail response will not be mailed a replacement form⁶. Another interesting finding is that the replacement form “lift” was substantial in the Spanish Assistance tracts (between 5-10%) even though the replacement form was English only.

In summary, the DR mail response data provide two site-specific looks into the Census 2010 audience segments and their behavior in the absence of a paid advertising campaign, grassroots activities of the partnership campaign, and the additional public relations and media attention that surround a decennial Census. This provides several pieces of useful information in planning the 2010 Census integrated communications campaign. First, we are provided an unbiased benchmark of mailback propensity without a paid campaign – this reveals some sense of the level of effort that must be extended to boost certain clusters. Second, since the mailout/mailback implementation used in the 2008 DR closely mirrors that planned for 2010, we gain insight into replacement mailing behavior across clusters and also how closely the clusters align with areas designated to receive a bi-lingual Spanish form. Since the current 2010 Replan calls for the elimination of a replacement form for high mail response areas, we also get some sense of gains that may be lost. Finally, we have another piece of analysis to further scrutinize the 2010 audience segmentation and explore if our assumptions (based on Census 2000 behavior) are as expected.

⁶ Under the 2010 Replan, the replacement mailing universe was scaled back to meet deadlines for getting replacement questionnaire packages printed and mailed back out within five days.

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