Ipsos Public Affairs
Project Report for the
Rural Broadband Study

Submitted to:
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Study Design & Documentation

Introduction

Ipsos Public Affairs (Ipsos) conducted the Rural Broadband Study on behalf of The Brookings Institution.

This study aims to provide a comprehensive look at rural broadband access and availability in the South United States, especially within rural Black and Hispanic southern communities. This study looks to gain detailed information on the state of rural southern broadband, current and desired uses for internet/broadband, and a holistic picture of how broadband access fits into investment for improving quality of life in rural area.

Sample Definition, Field Period and Survey Length

The survey was conducted on KnowledgePanel®, the largest online panel in the United States that relies on probability-based sampling methods for recruitment to provide a representative sampling frame for adults in the U.S. The target population was comprised of the following population: Adults, age 18+, in the rural South (as defined by the Client's list of zip codes); with an oversample of African Americans and Hispanics from opt-in panels.

In field, respondents were asked to provide their current zip code, with only those with qualifying zip codes eligible for participating in the study.

The survey was administered to English survey-takers and consisted of two stages: A pretest followed by a main survey. The final programmed instrument is shown in Appendix A.

The median completion time of the main survey was 18 minutes.

The completion and qualification rates for the main survey are presented below.

Sample	Field Start	Field End	N Fielded	N Completed	Completion Rate	N Qualified	Qualification Rate
KnowledgePanel	05/11/22	07/07/22	2,012	972	48.3%	933	96.0%
Opt-in	05/16/22	07/08/22	N/A	2,018	N/A	610	30.2%

Survey Cooperation Enhancements

As standard with KnowledgePanel surveys, email reminders were sent to KnowledgePanel non-responders on Day 3 of the field period. An additional reminder was sent to the remaining non-responders on Day 9, 15 and 21 of the field period.

Data File Deliverables and Descriptions

Ipsos prepared and delivered fully-formatted SPSS datasets containing the survey and demographic data with the appropriate variable and value labels. The table below shows the final Pretest and Main survey files delivered:

Delivery Date	File Type	File Name	N Records
04/28/2022	SPSS	24681_Brooking Broadband Survey_Pretest_Client file_04282022.sav	29
07/14/2022	SPSS	Brookings Rural Broadband Survey_Client_Weighted_07142022.sav	1,543

In addition, Ipsos prepared and delivered other deliverables as follows:

- One sets of post-stratification statistical weights
- Item timing data in seconds for all respondents
- Shifted latitude and longitude data

In addition to the survey variables from the Main interview, Ipsos' standard demographic profile variables created by Ipsos were provided in the data file. The following table shows the name and description of all variables included in the Main survey dataset.

Name	Label
CaseID	Case ID
qflag	Qualification Flag
tm_start	Interview start time (GMT)
tm_finish	Interview finish time (GMT)
duration	Interview duration in minutes
weight	Post-stratification weight (without political party adjustment)
Sample_Type	Sample Type
PPAGE	Age
PPEDUC	Education (Highest Degree Received)
PPEDUCAT5	Education (Categorical)
PPETHM	Race / Ethnicity
PPGENDER	Gender
PPHHSIZE	Household Size
PPHOUSE	Housing Type
PPINCIMP7	Household Income
PPMARIT5	Marital Status
PPMSACAT	MSA Status
PPREG4	Region 4 - Based on State of Residence
ppreg9	Region 9 - Based on State of Residence
PPRENT	Ownership Status of Living Quarters

PPSTATEN	State
PPT18OV	Presence of Household Members - Adults 18+
ppkid017	Presence of Household Members - Children 0-17
ppemploy	Current Employment Status
Masked_Long	Masked_Long
Masked_Lat	Masked_Lat
Precision	Precision

Key Personnel

Key personnel on the study include:

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Ipsos KnowledgePanel® Methodology

Introduction

Ipsos is passionate about social science, health, and public policy research. We collaborate closely with our clients throughout the research process, while applying rigor in every step. We specialize in innovative online research that consistently gives leaders in academia, government, and business the confidence to make important decisions. Ipsos delivers affordable, statistically valid online research through KnowledgePanel® and leverages a variety of other assets, such as world-class advanced analytics, an industry-leading physician panel, an innovative platform for measuring online ad effectiveness, and a research-ready behavioral database of frequent supermarket and drug store shoppers.

KnowledgePanel is the first and largest online research panel that is representative of the entire U.S. population. Panel members are randomly recruited through probability-based sampling, and households are provided with access to the Internet and hardware if needed.

Ipsos recruits panel members using address-based sampling (ABS) methods to ensure full coverage of all households in the nation. Once household members are recruited for the panel and assigned to a study sample, they are notified by email for survey taking, or panelists can visit their online member page for survey taking (instead of being contacted by telephone or postal mail). This allows surveys to be fielded quickly and economically. In addition, this approach reduces the burden placed on respondents, since email notification is less intrusive than telephone calls and the self-administered mode minimizes social desirability bias and positivity effects that can be present with an interviewer. Many respondents find answering online questionnaires more interesting and engaging than being questioned by a telephone interviewer. Furthermore, respondents have the convenience to choose what day and time to complete their assigned survey.

Ipsos Public Affairs

Ipsos Public Affairs has a strong tradition in working with sophisticated academic, government, and commercial researchers to provide high quality research, samples, and analyses. The larger Ipsos offers the fundamental knowledge for governmental agencies, academics, industries, retailers, services companies and the media need to provide exceptional quality in research to make effective decisions. It delivers a comprehensive range of information and consultancy services. Ipsos is one of the leading survey research organizations worldwide, operating in 90 countries with over 16,000 employees.

For further information, visit our website: www.ipsos.com.

KnowledgePanel Methodology

KnowledgePanel provides probability-based samples with an "organic" representation of the study population for measurement of public opinions, attitudes, and behaviors. The panel was first developed in 1999 by Knowledge Networks, an Ipsos company. Panel members are randomly selected so that survey results can properly represent the U.S. population with a

measurable level of accuracy and a calculable response rate, features that are not obtainable from nonprobability or opt-in online panels (for comparisons of results from probability versus nonprobability methods, see MacInnis et al., 2018[1] and Yeager et al., 2011[2]).

KnowledgePanel's recruitment process was originally based exclusively on a national RDD sampling methodology. In 2009, in light of the growing proportion of cellphone-only households, Ipsos migrated to an ABS recruitment methodology via the U.S. Postal Service's Delivery Sequence File (DSF)[3]. ABS not only improves population coverage, but also provides a more effective means for recruiting hard-to-reach individuals, such as cellphone-only households, non-internet households, young adults, and persons of color. Households without an internet connection are provided with a web-enabled device and free internet service.

After initially accepting the invitation to join the panel, participants are asked to complete a short demographic survey (the initial Core Profile Survey); answers to this survey allow efficient panel sampling and weighting for future surveys. Upon completing the Core Profile Survey, participants become active panel members. All panel members are provided privacy and confidentiality protections.

Adults from sampled households are invited to join KnowledgePanel through a series of mailings, including an initial invitation letter, a reminder postcard, and a subsequent follow-up letter. Moreover, telephone refusal-conversion calls are made to nonresponding households for which a telephone number could be matched to a physical address. Invited households can join the panel by:

- Completing and mailing back a paper form in a postage-paid envelope
- Calling a toll-free hotline phone number maintained by Ipsos
- Going to a designated Ipsos website and completing the recruitment form online

Household Member Recruitment

During the initial recruitment survey, all household members are enumerated. Following enumeration, attempts are made to recruit every household member who is at least 13 years old to participate in KnowledgePanel surveys. For household members aged 13 to 17, consent is collected from the parents or the legal guardian during the initial recruitment interview. No direct communication with teenagers is attempted before obtaining parental consent.

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[1] MacInnis, B., Krosnick, J., Ho, A., and M. Cho (2018). "The Accuracy of Measurements with Probability and Nonprobability Survey Samples: Replication and Extension." Public Opinion Quarterly, Winter 2018.

[2] Yeager, D., Krosnick, J., Chang, L., Javitz, H., Levendusky, M., Simper, A. and R. Wang (2011). "Comparing the Accuracy of RDD Telephone Surveys and Internet Surveys Conducted With Probability and Non-Probability Samples." Public Opinion Quarterly, Winter 2011.

[3] Fahimi, M. and D. Kulp (2009). "Address-Based Sampling – Alternatives for Surveys That Require Contacts with Representative Samples of Households." Quirk's Marketing Research Review, May 2009.

Survey Sampling from KnowledgePanel

Once panel members are recruited and profiled by completing our Core Profile Survey, they become eligible for selection for client surveys. Typically, specific survey samples are based on an equal probability selection method (EPSEM) for general population surveys. Customized stratified random sampling based on "profile" data can also be implemented as required by the study design. Profile data can also be used when a survey calls for pre-screening—that is, members are drawn from a subsample of the panel, such as females, Republicans, grocery shoppers, etc. (This can reduce screening costs, particularly for lower incidence subgroups.) In such cases, we ensure that all subsequent survey samples drawn that week are selected in such a way as to result in a sample that remains representative of the population distributions.

As detailed above, significant resources and infrastructure are devoted to the recruitment process for KnowledgePanel so that our active panel members can properly represent the adult population of the U.S. This representation is achieved not only with respect to a broad set of geodemographic indicators, but also for hard-to-reach adults (such as those without Internet access or Spanish-language-dominant Hispanics) who are recruited in proper proportions. Consequently, the raw distribution of KnowledgePanel mirrors that of the U.S. adults fairly closely, barring occasional disparities that emerge for certain subgroups due to differential recruitment and attrition.

For selection of general population samples from KnowledgePanel, a patented methodology has been developed such that samples from the panel behave as EPSEM samples. Briefly, this methodology starts by weighting the pool of active members to the geodemographic benchmarks secured from a combination of the U.S. Census Bureau's American Community Survey (ACS) and the latest March supplement of the U.S. Census Bureau's Current Population Survey (CPS) along several dimensions. Typically, the geodemographic dimensions used for weighting the entire KnowledgePanel include the following dimensions, with additional nesting of dimensions as well:

- Gender (Male/Female)
- Age (18–29, 30–44, 45–59, and 60+)
- Race/Hispanic ethnicity (White/Non-Hispanic, Black/Non-Hispanic, Other or 2+ Races/Non-Hispanic, Hispanic)
- Education (Less than High School, High School, Some College, Bachelor and beyond)
- Census Region (Northeast, Midwest, South, West)
- Household income (under $10k, $10K to <$25k, $25K to <$50k, $50K to <$75k, $75K to <$100k, $100K to <$150k, and $150K+)
- Home ownership status (Own, Rent/Other)
- Household size (1, 2, 3, 4+)
- Metropolitan Area (Yes, No)
- Hispanic Origin (Mexican, Puerto Rican, Cuban, Other, Non-Hispanic)
- Language Dominance (non-Hispanic and English Dominant, Bilingual, and Spanish Dominant Hispanic) when survey is administered in both English and Spanish

Using the resulting weights as measures of size, a probability-proportional-to-size (PPS) procedure is used to select study specific samples. It is the application of this PPS methodology with the imposed size measures that produces demographically balanced and representative samples that behave as EPSEM. Moreover, in instances where a study design requires any form of oversampling of certain subgroups, such departures from an EPSEM design are accounted for by adjusting the design weights in reference to the Census benchmarks for the population of interest.

Survey Administration

Once assigned to a survey, members receive a notification email letting them know there is a new survey available for them to complete. This email notification contains a link that sends them to the survey. No login name or password is required. The field period depends on the client's needs and can range anywhere from a few hours to several weeks.

Typically, after three days, automatic email reminders are sent to all non-responding panel members in the sample. Additional email reminders are sent and custom reminder schedules are set up as needed. To assist panel members with their survey taking, each individual has a personalized member portal listing all assigned surveys that have yet to be completed.

Ipsos also operates an ongoing modest incentive program to encourage participation and create member loyalty. The incentive program includes special raffles and sweepstakes with both cash rewards and other prizes to be won. On average, panel members complete three to four surveys per month with durations of about 10 to 15 minutes per survey. An additional incentive is usually provided for longer surveys.

Response Rates

As a member of the American Association of Public Opinion Research (AAPOR), Ipsos follows the AAPOR standards for response rate reporting. While the AAPOR standards were established for single survey administrations and not for multi-stage panel surveys, we use the Callegaro-DiSogra (2008)[4] algorithms for calculating KnowledgePanel survey response rates.

Ipsos KnowledgePanel Weighting

Study-Specific Post-Stratification Weights

Once all survey data have been collected and processed, design weights are adjusted to account for any differential nonresponse that may have occurred. Depending on the specific target population for a given study, geodemographic distributions for the corresponding population are obtained from the CPS, the U.S. Census Bureau's American Community Survey (ACS), or in certain instances from the weighted KnowledgePanel profile data. For this purpose,

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[4] Callegaro, M. and C. DiSogra (2008). "Computing Response Metrics for Online Panels." *Public Opinion Quarterly*, Vol. 72, No. 5.

an iterative proportional fitting (raking) procedure is used to produce the final weights. In the final step, calculated weights are examined to identify and, if necessary, trim outliers at the extreme upper and lower tails of the weight distribution. The resulting weights are then scaled to aggregate to the total sample size of all eligible respondents.

The weights described below were computed using an iterative proportional fitting (raking) procedure and the needed benchmarks were obtained from the weighted KnowledgePanel profile data.

For this study, our weighting process included the following steps.
1. In the first step, design weights for all KnowledgePanel (KP) assignees were computed to reflect their selection probabilities.

2. The above design weights for KP respondents who confirmed living in the rural Southern zip codes were raked to the following geodemographic distributions of the 18 and over US population resided in the rural Southern zip codes.
    a. Age (18-29, 30-44, 45-59, 60+) by Gender (Male, Female)
    b. Race/Hispanic ethnicity (White/Non-Hispanic, Black/Non-Hispanic, Other or 2+ Races/Non-Hispanic, Hispanic)
    c. Education (High School or less, Some College, Bachelor and higher)
    d. Census Division (South Atlantic, East-South Central, West-South Central)
    e. Household Income (under $25K, $25K-$49,999, $50K-$74,999, $75K-$99,999, $100K and over)

The resulting weights were trimmed and scaled to add up to the total number of KP respondents.

3. Next, opt-in Black and Hispanic respondents (started with weight=1.0) who confirmed living in the rural Southern zip codes were raked to the following geodemographic distributions of the 18 and over US Black and Hispanic population resided in the rural Southern zip codes.
    a. Age (18-29, 30-44, 45-59, 60+) by Gender (Male, Female)
    b. Race/Hispanic ethnicity (Black/Non-Hispanic, Hispanic)
    c. Education (High School or less, Some College, Bachelor and higher)
    d. Census Division (South Atlantic, East-South Central, West-South Central)
    e. Household Income (under $25K, $25K-$49,999, $50K-$74,999, $75K-$99,999, $100K and over)
    f. Calibration Variable 1 - Watch TV (< 3 hours/day, 3+ hours/day)
    g. Calibration Variable 2 - Internet for Personal Use (< 10 hours/week, 10+ hours/week)
    h. Calibration Variable 3 – Express Political/Community Opinions Online (Less than once a month or more often, Not at all)
    i. Calibration Variable 4 – Try new products (Not at all/Somewhat, A lot/Completely)

The resulting weights were trimmed and scaled to add up to the total number of opt-in respondents.

4. Lastly, KP and opt-in respondents (KP started with *kp_wt* and opt-In started with *offpanel_wt*) were first combined based on their respective effective sample sizes. Then, the combined respondents were raked to the following geodemographic distributions of the 18 and over US population resided in the rural Southern zip codes.
    a. Gender (Male, Female) by Race-Ethnicity (White, Other Race or 2+ Races/Non-Hispanic, Black/Non-Hispanic, Hispanic)
    b. Age (18-29, 30-44, 45-59, 60+) by Race-Ethnicity (White, Other Race or 2+ Races/Non-Hispanic, Black/Non-Hispanic, Hispanic)
    c. Education (High School or less, Some College, Bachelor and higher) by Race-Ethnicity (White, Other Race or 2+ Races/Non-Hispanic, Black/Non-Hispanic, Hispanic)
    d. Census Division (South Atlantic, East-South Central, West-South Central) by Race-Ethnicity (White, Other Race or 2+ Races/Non-Hispanic, Black/Non-Hispanic, Hispanic)
    e. Household Income (under $25K, $25K-$49,999, $50K-$74,999, $75K-$99,999, $100K and over) by Race-Ethnicity (White, Other Race or 2+ Races/Non-Hispanic, Black/Non-Hispanic, Hispanic)
    f. Gender (Male, Female) by Age (18-29, 30-44, 45-59, 60+)
    g. Race/Hispanic ethnicity (White/Non-Hispanic, Black/Non-Hispanic, Other or 2+ Races/Non-Hispanic, Hispanic)
    h. Hispanic Origin (Non-Hispanic, Mexican origin, Puerto Rican or Cuban origin, Other Hispanic origin)
    i. Calibration Variable 1 - Watch TV (Black or Hispanic < 3 hours/day, Black or Hispanic 3+ hours/day, White/Other Race/2+ Races)
    j. Calibration Variable 2 - Internet for Personal Use (Black or Hispanic < 10 hours/week, Black or Hispanic 10+ hours/week, White/Other Race/2+ Races)
    k. Calibration Variable 3 – Express Political/Community Opinions Online (Black or Hispanic less than once a month or more often, Black or Hispanic not at all, White/Other Race/2+ Races)
    l. Calibration Variable 4 – Try new products (Black or Hispanic not at all/somewhat, Black or Hispanic a lot/completely, White/Other Race/2+ Races)

The resulting weights were trimmed and scaled to add up to the total number of combined respondents. These final weights were labeled as *weight* with 1,543 cases.

Weights Definition
Final calibrated weights for total KP and Opt-In respondents

Trimming
kp_wt: (2.04 %, 97.96%)
offpanel_wt: (4.10%, 95.90%)
weight:
  White, Other, 2+ Races: (2.58%, 97.55%)

Black: (2.44%, 97.56%)
Hispanic: (5.31%, 94.97%)

Design Effect
Design Effect
kp_wt: 1.6954
offpanel_wt: 2.5011
weight: 2.4290
White, Other, 2+ Races: 1.6798
Black: 1.9886
Hispanic: 2.7649

Range on Weights

Variable	N	Minimum	Maximum	Mean	Median	Coeff of Variation	1st Pctl	99th Pctl	Sum
weight	1543	0.011	7.146	1	0.694	119.539	0.011	7.146	1543

Detailed information on the demographic distributions of the benchmarks can be found in Appendix B.

KnowledgePanel Calibration
Studies that need a large number of respondents, or those that focus on rare subpopulations, can require sample sizes that KnowledgePanel may not be able to provide. In such instances, a blended sample from both KnowledgePanel and nonprobability online panels can provide an effective alternative that raises the quality of the data. For such applications, our pioneering Calibration methodology is used to correct for biases due to systematic undercoverage associated with the nonprobability samples from online panels. As compared to samples that exclusively rely on nonprobability samples without any calibration, our calibrated weights enable the resulting blended sample to represent the target population more effectively and offer more robust inferential possibilities. This improved representativeness is not only with respect to geodemographic distributions, but also with respect to an important set of attitudinal/behavioral measures.

Based on repeated studies, it has been demonstrated that respondents from nonprobability and probability-based samples differ in several ways. For instance, respondents from nonprobability samples use the internet more often and have a higher propensity for adopting new products and services than the general U.S. population. Moreover, our ongoing research has identified additional measures with respect to which significant differences exist. As such, our new calibration methodology aims to realign such respondents from nonprobability samples with respect to a multidimensional set of measures that are significant differentiators between the two types of sample sources.

1. Approximately, how many hours of television do you watch on an average day?
2. In a typical week, about how many hours do you spend on the internet for personal use?
3. How often, if at all, have you used the internet to express your opinions about POLITICAL or COMMUNITY issues within the last 12 months?
4. How much does the following statement describe you?

With the above questions administered to both KnowledgePanel and non-KnowledgePanel respondents, we can then identify how the two sets of responses differ and apply correcting weights to realign non-KnowledgePanel respondents with those from the probability-based KnowledgePanel sample component. Consequently, when survey data from non-KnowledgePanel respondents are calibrated with those from the KnowledgePanel, survey estimates from the blended sample are improved and a larger sample is secured to accommodate the analytic needs of a study.