



Surveys of Consumers Technical Report

Technical Documentation for the 2024 Methodological Transition to Web Surveys

April 5, 2024

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This report provides data users with information about the sample design, data collection methods, data processing procedures, response rates, weighting and variance estimation during the Surveys of Consumers' methodological transition in 2024 from a telephone survey using a random digit dialing (RDD) cell phone frame to a web survey using address-based sampling (ABS):

- January – March 2024: RDD Cell Telephone Surveys
- April – June 2024: RDD Cell Telephone Surveys and ABS Web Surveys
- July 2024 onward: ABS Web Surveys

Section 1 reports sampling methods used for Surveys of Consumers (SOC) since 1978, including both the household and adult (within household) sampling. This report also provides a discussion on the planned sample size for the transition period from RDD cell phone surveys to ABS web surveys.

Section 2 describes the data collection methods used in 2024. This section also provides data users with information about the response rates expected under the current data collection protocols.

Section 3 discusses standard data editing procedures, including coding open-ended responses, and addresses the steps taken for ensuring data quality.

Section 4 conceptualizes the method effects for this methodological transition, including their implications for the interpretation of monthly estimates.

Finally, section 5 describes the weighting and variance estimation methods used in SOC 2024. This report presents the steps used to create the analytical weights for analyzing the data from the households and advises data users on the proper variance estimation method.

1. Sample Design

1.1. Sample Design Objectives

The sample design aims to enhance the study of changes in economic attitudes over time by incorporating a rotating panel sample in an ongoing monthly survey program. Each month, an independent cross-sectional sample is drawn; those who completed interviews in a given month become eligible for re-interviews approximately six and twelve months later. Thus, each monthly sample is composed of a mix of interviews from the independent cross-sectional sample (hereinafter called the fresh sample) and the recontact sample. Due to periodic adjustments to the sample design, there is some variation across time in the proportion of fresh and recontact samples. ¹The survey population includes households from the coterminous United States (48 states plus the District of Columbia).

The Surveys of Consumers (SOC) has been a monthly telephone survey with random digit dialing sampling since 1978 and will transition completely to monthly web surveys with address based sampling by July 2024. This document discusses the telephone and web survey methodologies and the sample plan for the transition period between April 2024 to June 2024. ²

Table 1 presents the SOC sampling frame and data collection method by survey period. From January 1978 through July 2012, a landline telephone frame (Landline RDD Sampling Frame) was used to draw independent cross-sectional samples of households for participation in the surveys. From July 2012 to January 2015, this monthly landline telephone sample was supplemented by a cell telephone sample. Since January 2015, the SOC has used a RDD cell telephone sampling frame. As outlined in Section 1.4, there will be a transition period from April 2024 to June 2024 where the published estimates will be from RDD cell telephone interviews and ABS web interviews. Starting in July 2024, the ABS frame will be used to conduct web interviews. While this section details the prescreening and selection protocols in the landline and cell RDD frames and ABS frames, Section 5 presents the weighting procedures using RDD cell telephone sampling and ABS sampling protocols.

¹ There is periodic variation in the proportions of fresh and recontact samples, primarily due to adjustments in the sample design; exact proportions can be found in the monthly micro-data files.

² Data users who are interested in data prior to January 1978 should refer to the contemporaneous methodology reports from those previous time periods.

Table 1. Surveys of Consumers Sampling Frame and Data Collection Method

Survey Period	Sampling Frame	Data Collection Method
Nov. 1952 – Dec. 1977	Area Probability Sampling	In-person interviewing
Jan. 1978 – Sep. 1993	Landline Random Digital Dialing (RDD) Sampling	Telephone interviewing
Oct. 1993 – Jul. 2012	Landline RDD Sampling	Computer-assisted telephone interviewing (CATI)
Jul. 2012 – Dec. 2014*	Dual RDD Sampling	CATI
Jan. 2015 – Mar. 2024**	Cell RDD Sampling	CATI
Apr. 2024 – Jun. 2024	Cell RDD Sampling Address Based Sampling (ABS)	CATI based on Cell RDD frame Web interviewing based on ABS frame
Jul. 2024 – ongoing	ABS	Web interviewing

* The Cell (RDD) sample was added in July 2012, and the 6-month re-interview Cell (RDD) sample was added in January 2013.

** The fresh sample was drawn only from the Cell (RDD) sample starting in January 2015. The re-interview landline sample was included till June 2016.

1.2. Sampling Frames used in the Surveys of Consumers

1.2.1. Landline (RDD) Sampling Frame (1978-2014)

During this period, random digit dialing (RDD) telephone sampling was used to draw the monthly SOC national probability sample. From January 1978 to October 1993, the SOC drew a nationally representative sample of telephone numbers from the University of Michigan Institute for Social Research Survey Research Center (SRC)'s Waksberg-Mitofsky hundred series frame. After a transition period from October 1993 to February 1994, starting February 1994, the SOC sample was selected from a list-assisted RDD frame using the Marketing Systems Group's GENESYS Sampling System.

SRC's Waksberg-Mitofsky hundred series frame (January 1978 – October 1993)

Starting 1978, the SOC drew monthly samples using a two-stage design from the Survey Research Center's (SRC) Waksberg-Mitofsky hundred series frame (Waksberg, 1978). This frame used quarterly data from the telecommunications company AT&T. AT&T also allowed the SRC to check with their agents if a noncontact number was assigned to a household.

List-assisted hundred series frame (February 1994 – December 2014)

Starting February 1994, the SOC drew monthly samples using a list-assisted hundred series frame (Brick, Waksberg, Kulp, and Starer, 1995; Casady and Lepkowski, 1993; Tucker, Lepkowski, and Pekarski, 2002). In this frame, the hundred series is defined in the same way as in the Waksberg-Mitofsky frame. This list-assisted sampling frame consists of all hundred series³ which have at least one listed household number. The frame is produced by aggregating all directory-listed household telephone numbers to the hundred series level. Because of the way telephone numbers are assigned, a hundred series which has at least one listed household number is more likely to have other residential telephone numbers.

In particular, the SOC used (Marketing Systems Group) GENESYS's (Legacy) Landline RDD sampling frame. In constructing GENESYS's hundred series, one of the sources used was the infoUSA residential database consisting of all known telephone numbers. Moreover, on a quarterly basis, Telcordia Technologies data products were used to validate prefixes/banks and reflect the latest area code changes due to splits. These data sources were also used to restrict the GENESYS frame to landline households only. GENESYS's Legacy Landline RDD Frame was updated yearly or quarterly.

In addition, the SOC used methods developed at the Survey Research Center (SRC) at the University of Michigan Institute for Social Research to prescreen generated numbers against a known business number list. Tri-tone screening was also used to detect numbers not connected to an active phone line. Starting in 2010, the SRC started to use GENESYS-CSS screening, an interviewer-administered screening process for landline RDD sample to identify non-productive numbers. During this process, all listed and unlisted residential numbers in the GENESYS's (Legacy) Landline RDD sampling frame, excluding listed business numbers, were screened. GENESYS-CSS identified the vast majority of business and non-

³ The term "hundred series" refers to the first eight digits of a phone number—the area code, exchange, and the first two digits of the remaining four numbers. One hundred possible phone numbers can be formed from each hundred series by adding the set of numbers "00" to "99" to create 10-digit phone numbers.

working numbers, including those with and without tri-tones, fax/modem lines, as well as those with other dispositions, in addition to both dedicated cellular and ported landline-to-wireless numbers.

1.2.1.1. Within Household Selection in the Landline (RDD) Sampling Protocol

The Landline RDD sampling frame provides for an equal probability sample of all telephone households; within each household, probability methods (described in detail below) are used to select one adult as the designated respondent. At the time of the initial contact with the household, a listing is taken of all household members that are 18 or older. In the paper and pencil version of the survey instrument (January 1978-October 1992), a specific member of the household from this list of eligible respondents is selected by the interviewer using the "respondent selection table" assigned to that household's coversheet. These selection tables were assigned to households so that each adult has a known selection probability across households of all sizes, as well as differences in age and sex composition. Giving each selected respondent a weight equal to the number of adults in the household would then transform the sample of households to a sample of the adult population. In the computerized version of the instrument, one adult was randomly selected as the designated adult by the computer. Given the number of adults living in a household, the adult-level unequal selection probabilities were adjusted by the number of adults in a household.

1.2.2. Random Digital Dialing (RDD) Cell Phone Frame (July 2012 – June 2024)

U.S. telephone providers do not publicly release the specific cell telephone numbers assigned to subscribers. Since a sample of cell telephone numbers cannot be obtained from a list of subscribers, a random digit dialing system is used to generate telephone numbers to be called.

A sample provider (SOC uses Marketing Systems Group's GENESYS system) obtains a list of all possible seven-digit cell telephone thousand series from the U.S. NANPA contractor. All 1,000 possible suffixes, from 000 to 999, are appended to the seven-digit codes to generate all possible 10-digit cell telephone numbers. The sample provider then randomly selects numbers without replacement from this frame of all possible cell telephone numbers dedicated to providing cellular service. The database is updated quarterly and contains all cellular dedicated thousand series in the country and can be defined by a variety of geographies, including area code, state, and national geography. In this method, the Cell RDD sample frame contains working, non-working and unassigned numbers to ensure each telephone number has a known and equal probability of selection.

The SOC staff selects a sample of such cell telephone numbers using the Marketing Systems Group system. The SOC staff checks the sample, and then returns it to Marketing Systems Group to append activity codes provided by telephone companies for each cell phone number. The activity codes are determined by two GENESYS Sampling System screening processes: Cell-WINS and CNS. The SOC has used CNS since 2012 and Cell-WINS screening was added in April 2013. CNS (Activity Flagging) attempts to determine the activation status of a cell phone number. This can be any activity and is not limited to making or taking calls. Through the Cell-WINS screening process, a number will receive a flag of active, inactive, or unknown (typically less than 5% of the file will be flagged as unknown). The SOC staff then selects from the sample those numbers with specific activity codes known to more likely be active. These pre-screened numbers are then called by the University of Michigan Telephone Interviewing Facility staff. Unassigned numbers are discovered only during dialing. Cell phones are considered to be personal devices, therefore the selection is at the adult level.

1.2.3. Address-Based Sampling (ABS) Frame (April 2024 – ongoing)

Monthly ABS lists provided by Marketing Systems Group's GENESYS system are used to represent all households in the continental United States. The sample of addresses are selected with equal probabilities from an updated list provided by the U.S. Postal Service (USPS), which included numerous auxiliary variables pertaining to the addresses. The SOC ABS lists include postal addresses from the 48 coterminous states and the District of Columbia, including those on the do-not-mail list, those designated as rural road delivery, drops, throwbacks, P.O. Boxes, and seasonal residences, while excluding addresses labeled as vacant.

1.2.3.1. Within Household Selection in Address-Based Sampling (ABS) Protocol

The SOC instructions request that the survey be completed by an adult aged 18 years or older, or their spouse or partner, in whose name the housing unit is owned or rented. This method is one of many within-household selection methods identified in the survey methodology literature for use in self-administered and mixed-mode surveys (Olson et al., 2020).

1.3. Monthly Survey Sample Design for Phone and Web Interviews

Historically, our goal has been to maintain a maximum standard error of approximately 5 percentage points for the Sentiment Index and 6 percentage points for the Current Conditions and Expectations Indices in the monthly telephone surveys. Appendix Table 1 indicates that conducting a minimum of 500 interviews meets this criterion. The sample size calculations for the web surveys adhere to the same standards.

In addition to establishing a target total sample size, our SOC sample design incorporates two further objectives: 1) The twice monthly release of reports, and 2) A specific ratio of fresh to recontact interviews within each reporting period. To achieve these objectives, we have determined a daily target of interviews for each sample type—fresh versus recontact—for both telephone and web surveys. This approach ensures the on-time delivery of data twice a month while maintaining the predetermined ratio of fresh to recontact interviews.

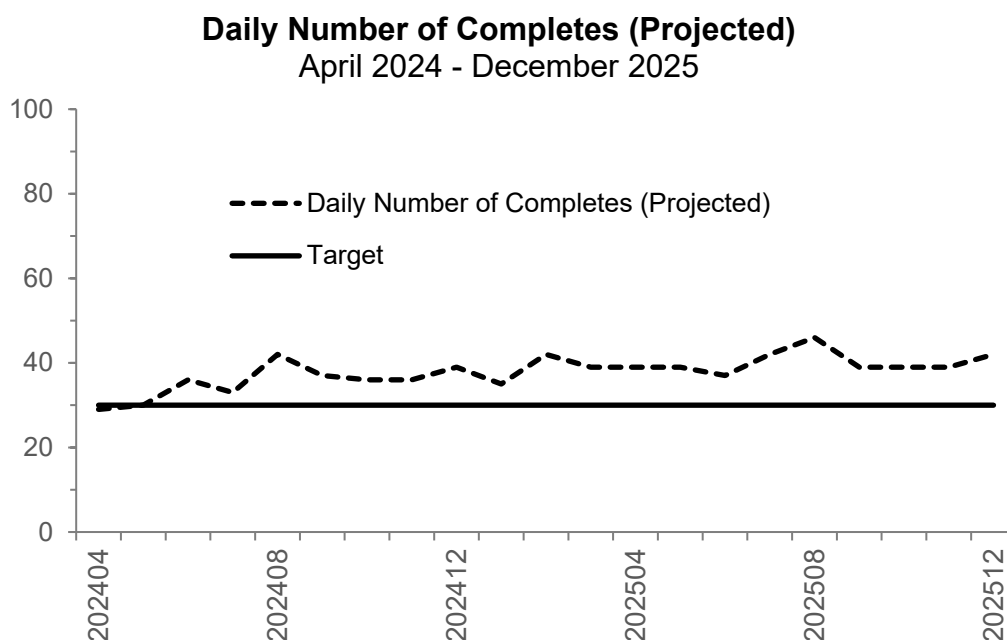
With this in mind, the telephone surveys have targeted 600 complete interviews per month, with a split of 320 and 280 interviews each for fresh and recontact, respectively. For a 27-28 day long survey period, the average daily target is 26 for the preliminary release period, and 16 for the period between the preliminary and final releases. The daily split is roughly proportional to the overall 320/280 target. The recontact sample is composed of second and third interviews of respondents from prior months. In each month, approximately two thirds of the recontact sample are second interviews and one-third is third interviews. Each sample case can be interviewed up to three times with 6 month intervals.

The web surveys have a weekly target of 215 complete interviews with a 125/90 fresh/recontact sample split, and a daily target of a minimum of 30 completes. This sample size calculation assumed response rates of 3% for fresh and 48% for and recontact samples. The sample size calculation also assumed 86% of interviews would meet the completeness criterion described in Section 3.1. This assumption was made based on the annual average percentage of interviews that met the completeness criterion in 2023.

Based on these weekly targets, we projected the number of daily completes from April 2024 to December 2025 period (Figure 1). As the fresh sample release sizes grow over the course of 2024, the recontact completes are projected to reach the targeted level in December 2024. The daily number of completes is projected to vary between 35 and 46.

In each calendar year, ten monthly releases cover four-week survey periods, and two releases cover five-week survey periods. Given the weekly targets for web data collection, five-week reporting months (35 survey field days) will yield a larger number of completes than the typical four-week months. SOC staff monitor the actual response and completion rates as time progresses to ensure the targets are being met. If the rates are significantly higher or lower than the projections, the sample sizes or strategies may need further adjustments to align with the objectives.

Figure 1. Projected Daily Number of Completes, Surveys of Consumers Monthly Web Surveys, April 2024- December 2025



1.4. Transition Period Sample Design

The transition period between April 2024 and June 2024 employs parallel data collection methods following the sample design described in Section 1.3. For reporting purposes, during the transition from telephone surveys to web surveys, the total sample size will increase while the share of official data from telephone interviews gradually decreases. Both survey estimates still each represent the target population estimates. This scaling strategy incorporates a predefined number of daily completes, segmented into fresh and recontact interviews—a structure supporting the consistency of data flow.

Historical analysis of monthly time series correlations dating back to January 2017, suggests a robust correlation between key indicators obtained from telephone and web interviews. The Survey of Consumers (SOC) has routinely revised its methodological approach, historically incorporating a blend of

new and legacy methodologies in its composite estimates. Our approach carries forward this tradition, systematically altering the mix between telephone and web data within the finalized publishable estimates from March 2024 to July 2024, as shown in Figure 2.

Survey methodology scholars have identified numerous methods for transitioning from one method to another. The Surveys of Consumers prioritized simplicity and transparency in selecting and developing its method. Indeed, it is dependent upon the strong correlations observed in the time series data.

Given the plans outlined in Section 1.3, the target number of complete interviews is increasing from the 600 targeted in March 2024 to 988 interviews in June 2024. The intervening months will target the following:

For April: we aim to conduct 600 telephone interviews and 194 web interviews, totaling 794 complete interviews. The distribution between telephone and web interviews will result in approximately 76% of interviews being conducted via telephone and the remaining 24% via the web.

In May, our goal is to achieve the overall target of 988 completes, consistent with June's target. To transition towards a more balanced approach between telephone and web interviews, we will increase the number of web interviews by adding 1.5 times the standard monthly increase of 291 to the web interviews count. This translates to an additional 485 web interviews. At the same time, we will reduce the number of telephone interviews by 97. Assuming a total of 988 interviews, we will aim for an even split, where approximately 50% of the interviews will be via telephone and 50% via web.

For June, we will adjust the balance further by reducing the telephone interviews count by 256 and increasing the web interviews count by the same amount. This will achieve an estimated distribution of 25% telephone interviews and 75% web interviews out of the total 988 targeted completes.⁴

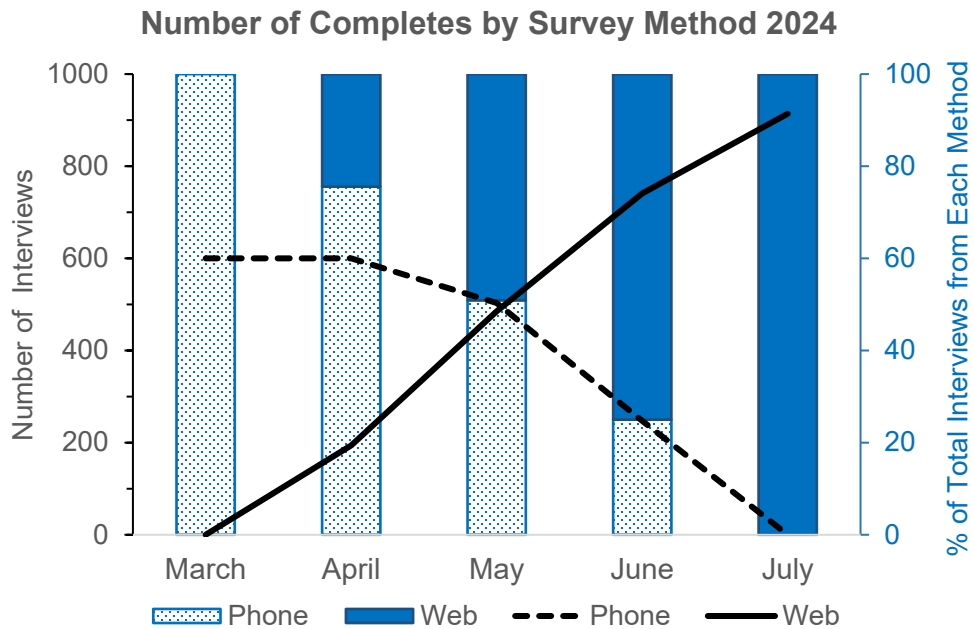
To summarize the plan:

- In April, we will complete 794 interviews (600 telephone, 194 web).
- In May, we will target 988 completes with an aim for an even split:
 - Increase web interviews by 485 (from 194 to 485).
 - Reduce telephone interviews by 97 (from 600 in April to 503 in May).
- In June, we will maintain 988 completes with a target distribution of 25% telephone and 75% web interviews:
 - Increase web interviews by 256 (from 485 in May to 741 in June).
 - Reduce telephone interviews by 256 (from 503 in May to 247 in June).

Adjustments are rounded to the nearest whole number when necessary.

⁴ Alternatively, we could have kept the reduction in the telephone interviews to be equal to 194 which would have yielded 30/70 split for telephone and web interviews. We chose to keep the method effect contribution to be constant over the four months (please see section 4). This gives us a slightly steeper reduction in the number of telephone interviews.

Figure 2. Number of Completes per Survey Method, Surveys of Consumers Monthly Web Surveys, April 2024- July 2024



See Section 4 for a discussion of the implications of this transition on interpreting estimate of change across time.

2. Data Collection Methods

This section describes data collection methods used for telephone interviewing (June 2024 and earlier) and web interviewing (April 2024 and later). All data are collected using a computer-assisted telephone or web interviewing (CATI or CAWI) system. These data collection activities described here have been executed in partnership with the Survey Research Operations (SRO) group at the University of Michigan Institute for Social Research: developing and programming the survey instruments, recruiting and training interviewers to administer the survey in two languages, planning and implementing a strategy for release of the sample, contacting respondents and conducting interviews, and implementing quality assurance procedures.

2.1. Description of Telephone Interviewing

Survey Research Operations (SRO) at the University of Michigan’s Institute for Social Research is responsible for hiring and training interviewers, known as Survey Research Technicians, and managing the monthly interview completion. Each month, the questionnaires are prepared in advance and circulated alongside supporting materials, such as the codebook and explanations regarding the purpose and administration of each question. Interviewers are responsible for manually dialing assigned cell phone numbers and conducting the interviews. Interviews can be conducted in English or Spanish. To respect the respondents' time, calls are not placed before 9:00 AM or after 9:00 PM in the respondent’s local time zone, unless specifically requested otherwise. A phone number that results in no response is attempted up to three times. All operational interviews are recorded for quality control.

SRO's Quality Control (QC) department randomly audits these recordings for each interviewer to ensure adherence to the General Interviewing Technique protocols and the precise capture of data. Interviewers regularly meet with QC personnel to review their performance, acknowledge their successes, receive constructive feedback, and discuss opportunities for enhancement. Overnight, a dedicated team of coders processes open-ended responses, simultaneously evaluating each interview for its thoroughness and overall quality.

2.2. Telephone Interviewing Materials

New participants are contacted via telephone call. Respondents who complete their interviews and provide their email addresses may be sent a newsletter detailing the survey's objectives. For a given month, participants who completed interviews previously and provided an email address will receive an email reminder six months post-interview in preparation for their follow-up interview. During the field period, they will receive up to two reminders by email. The thank you, invitation, and reminder email messages are below.

Thank you emails (sent to phone respondents after production ends)

Subject: Thank you for participating in University of Michigan survey

Body:

Dear {{RFNAME}}:

Thank you very much for the contributions you provided for the Survey of Consumer Attitudes. We value your willingness to give us your time and opinions. Attached is additional information about our research.

Your contribution to our study is appreciated. If you have any questions, please contact our Survey Research Center at 1-877-556-1542.

Thank you,

Joanne Hsu
Surveys of Consumers
University of Michigan
<http://soc.isr.umich.edu>
umich.soc@umich.edu

Attach: Newsletter YYYY.pdf

Invitation email message to recontact sample

Subject: What's your opinion about the economy?

Body:

Dear {{RFNAME}},

You previously took part in a survey conducted by the Survey Research Center at the University of Michigan, providing information vital to determine the economic well-being of the nation. You have probably heard media reports about consumer confidence based on this survey.

We would like to call you during the months of {{THISMON}} or {{MONTH}} to understand what changes have occurred to complete the research.

In order for the data to be accurate we need to talk with the same people that we interviewed six months ago. As before, the interview is completely voluntary and all information provided will be held in strict confidence.

An interviewer will be calling you soon, or you can call us on our toll free number 1-877-556-1542, seven days a week. If your phone number has changed in the past six months, please let us know -- email us at umich.soc@umich.edu or call 1-877-556-1542.

Thank you for your help with this important research.

Sincerely,
Joanne Hsu
Director, Surveys of Consumers
University of Michigan

First reminder email message to recontact sample

Subject: We haven't been able to reach you

Body:

Dear {{RFNAME}},

You have been selected once again to be included in an important survey conducted by the University of Michigan. The survey documents how recent changes in economic conditions have affected people and what economic changes people expect in the years ahead. You have probably heard media reports about consumer confidence based on this survey.

The Survey Research Center at the University of Michigan has measured consumer confidence for over half a century. In order for the results to be accurate, it is important that everyone selected for the survey actually participates. Many important decisions by government agencies and other policy makers depend in part on how accurately the survey represents everyone's opinions. No one else can substitute for you in this research.

Please call us at 1-877-556-1542 to obtain more information or to schedule an interview. We are open seven days a week. If your phone number has changed in the past six months, please let us know -- email us at umich.soc@umich.edu or call 1-877-556-1542.

Thank you for your help with this important research.

Sincerely,
Joanne Hsu
Director, Surveys of Consumers
University of Michigan

Second reminder email message to recontact sample

Subject: Last chance to participate

Body:

Dear {{RFNAME}},

Thank you for your continued participation in the University of Michigan's Surveys of Consumers. This is the last reminder message regarding your opportunity to participate in the University of Michigan's Surveys of Consumers study. Your responses to this survey are very important and will help us to understand how recent changes in economic conditions have affected people. Taking part in the study will ensure that the data are representative of all people.

Interviewing for this month ends soon. Please email us at umich.soc@umich.edu to obtain more information or call us at 1-877-556-1542 to complete an interview today.

Thank you for your help with this important research.

Sincerely,

Joanne Hsu

Director, Surveys of Consumers

University of Michigan

2.3. Description of Web Interviewing

The primary method of contact involves sending invitations and reminders by mail for participants to complete the online survey. In the case of recontact samples that provided an email address during an earlier interview, these mailings are accompanied by email correspondence. Nonrespondents receive one further reminder two weeks after the initial contact. Each sampled case has up to three months to complete the survey. The monthly sample is broken down by weeks and days for each survey month. Invitations and reminders are dispatched on a thrice weekly basis—every Monday, Wednesday, and Friday.

2.4. Web Interviewing Materials

We present the mail and email invitation and reminder letters in this section.

Mail Invitation (fresh sample)

January 19, 2024 202401-22001

TOWN AREA RESIDENT
XXX ST APT XXX
TOWN MI XXXXX-XXXX

Dear Town Area Resident:

The Survey Research Center at the University of Michigan has measured consumer confidence in the nation's economy for over half a century. The survey shows how recent changes in economic conditions have affected people like you. You have probably heard reports in the media about the latest findings on consumer confidence, which are based on this research. Your household has been selected to be included in this month's survey.

Please complete the survey **online**, type the survey link provided below into your web browser and enter the Login ID to begin the survey. Please have an adult 18 years or older complete the survey; it should take approximately 15 minutes.

Survey web link: umsurvey.umich.edu
Login ID: JAN22001E



This will take you to the web survey!

All information provided will be kept in strict confidence. No identifying information will ever be released to anyone.

Should you have questions regarding the survey content or website access, please contact the Surveys of Consumers at umich.soc@umich.edu or call our office at 1-866-989-0051 and leave a message with your name and number and someone will promptly return your call.

Thank you for your help with this important research.

Sincerely,

Joanne Hsu
Director, Surveys of Consumers
University of Michigan

Estimado(a) residente del área de Town:

El Centro de Encuestas de la Universidad de Michigan lleva más de medio siglo midiendo la confianza de los consumidores en la economía nacional. La encuesta muestra cómo los cambios recientes en las condiciones económicas han afectado a personas como usted. Probablemente usted haya escuchado información en los medios de comunicación sobre la confianza de los consumidores, la cual proviene de nuestro estudio. Su hogar ha sido seleccionado para ser incluido en la encuesta de este mes.

Por favor complete la encuesta **en línea**. Escriba el enlace de la encuesta que aparece a continuación en su navegador web e ingrese el ID de inicio de sesión. La encuesta la debe completar un adulto de 18 años o más. Le tomará aproximadamente 15 minutos completar este cuestionario.

Enlace a la encuesta : umsurvey.umich.edu
Identificación (ID) de inicio de sesión : JAN22001E



¡Esto le llevará a la encuesta web!

Toda la información que usted provee se mantendrá de manera estrictamente confidencial. No divulgaremos a nadie ninguna información que pudiera identificar a los participantes.

Si tiene alguna pregunta, por favor no dude en contactar la Encuesta de Consumidores al umich.soc@umich.edu.

Muchas gracias por su ayuda en este estudio tan importante.

Atentamente,

Joanne Hsu
Director de la Encuesta de
Consumidores
Universidad de Michigan

Mail Reminder (fresh sample)

January 22, 2024

202401-11401

TOWN AREA RESIDENT
AVE APT
TOWN MI XXXXX-XXXX

Dear Town Area Resident:

Recently, we sent a letter asking for your participation in the consumer confidence survey conducted by the University of Michigan. The Survey Research Center at the University of Michigan has measured consumer confidence in the nation's economy for over half a century. You have probably heard reports in the media about the latest findings on consumer confidence, which are based on this research. The survey will document how recent changes in economic conditions have affected people like you.

If someone in your household has already completed the online survey, we thank you for your participation. If not, please have an adult 18 years or older complete the survey by typing the survey web link provided below into your web browser and entering the Login ID. The survey should take approximately 15 minutes to complete.

Survey web link: umsurvey.umich.edu
Login ID: JAN1401T



This will take you to the web survey!

All information provided will be kept strictly confidential. No identifying information will ever be released to anyone.

Should you have questions regarding the survey content or website access, please contact the Surveys of Consumers at umich.soc@umich.edu or call our office at 1-866-989-0051 and leave a message with your name and number and someone will promptly return your call.

Thank you for your help with this important research.

Sincerely,

Joanne Hsu
Director, Surveys of Consumers
University of Michigan

Estimado(a) residente del área de Town:

Recientemente le enviamos una carta solicitando su participación en la encuesta sobre la confianza de los consumidores que está llevando a cabo la Universidad de Michigan. El Centro de Encuestas de la Universidad de Michigan lleva más de medio siglo midiendo la confianza de los consumidores en la economía nacional. Probablemente usted haya escuchado información en los medios de comunicación acerca de los datos recientes sobre la confianza de los consumidores, la cual proviene de nuestro estudio. La encuesta documentará cómo los cambios recientes en las condiciones económicas han afectado a personas como usted.

Si alguien de su hogar ya ha completado la encuesta en línea, le agradecemos su participación. Si no lo han completado, la encuesta la debe completar un adulto de 18 años o más. Escriba el enlace de web que aparece a continuación en su navegador web e ingrese el ID de inicio de sesión. Le tomará aproximadamente 15 minutos completar este cuestionario.

Enlace a la encuesta: umsurvey.umich.edu
Identificación (ID) de inicio de sesión: JAN1401T



¡Esto le llevará a la encuesta web!

Toda la información que usted provee se mantendrá de manera estrictamente confidencial. No divulgaremos a nadie ninguna información que pudiera identificar a los participantes.

Si usted tiene preguntas acerca del contenido de la encuesta o sobre el acceso a la página de web, por favor no dude en contactar la Encuesta de Consumidores al umich.soc@umich.edu.

Muchas gracias por su ayuda en este estudio tan importante.

Atentamente,

Joanne Hsu
Director de la Encuesta de
Consumidores
Universidad de Michigan

Mail Invitation (recontact sample)

January 10, 2024 202401-50080

SURVEYS OF CONSUMERS RESPONDENT
XXXX ST
TOWN, MI XXXXX-XXXX

Dear FNAME:

Six months ago, you participated in a survey for the University of Michigan's Surveys of Consumers. The survey shows how recent changes in economic conditions have affected people like you. We would like your participation again as it is important to understand how people's economic situation changes over time.

For this interview, we would like you to share your opinions using a web survey. Please type the survey link provided below into your web browser and enter the Login ID to complete the survey at your earliest convenience. As before, this questionnaire should take approximately 15 minutes to complete.

Survey web link: umsurvey.umich.edu
Login ID: JAR0080E



This will take you to the web survey!

All information provided will be kept strictly confidential. No identifying information will ever be released to anyone.

Should you have questions regarding the survey content or website access, please contact the Surveys of Consumers at umich.soc@umich.edu. You may also call us at 1-866-989-0051 and leave us a message and we will return your call as quickly as possible.

Thank you again for all the help you have given us, and for your willingness to take part in this follow-up survey.

Sincerely,

Joanne Hsu
Director, Surveys of Consumers
University of Michigan

Spanish Mail Invitation (recontact sample)

20 de noviembre de 2023

202312-50007

SURVEYS OF CONSUMERS RESPONDENT
XXXX ST
TOWN, MI XXXXX-XXXX

Estimado/a Osirs:

Hace seis meses, usted participó en una encuesta para el Estudio de Consumidores de la Universidad de Michigan. La encuesta muestra cómo los cambios recientes en las condiciones económicas han afectado a personas como usted. Nos gustaría contar con su participación nuevamente ya que es importante entender cómo la situación económica de la gente cambia con el paso del tiempo.

Para esta entrevista, nos gustaría que usted comparta sus opiniones usando una encuesta web. Por favor ingrese el enlace proporcionado a continuación en su navegador web, e ingrese el ID de inicio de sesión para completar la encuesta cuando le sea posible. Como antes, esta encuesta le tomará aproximadamente 15 minutos.

Enlace a la encuesta: umsurvey.umich.edu
Identificación (ID) de inicio de sesión: HNR0007S



¡Esto le llevará a la encuesta web!

Toda la información que usted provee se mantendrá de manera estrictamente confidencial. No divulgaremos a nadie ninguna información que pudiera identificar a los participantes.

Si usted tiene preguntas acerca del contenido de la encuesta o sobre el acceso a la página de web, por favor no dude en contactar la Encuesta de Consumidores al umich.soc@umich.edu.

Gracias nuevamente por toda la ayuda que nos ha brindado, y por estar dispuesto/a a tomar parte en esta encuesta de seguimiento.

Atentamente,

Joanne Hsu
Director de la Encuesta de
Consumidores
Universidad de Michigan

Mail Reminder (recontact sample)

December 21, 2023 202312-50219

SURVEYS OF CONSUMERS RESPONDENT
XXXX ST
TOWN, MI XXXXX-XXXX

Dear FNAME:

Six months ago, you participated in a survey for the University of Michigan's Surveys of Consumers. The survey shows how recent changes in economic conditions have affected people like you. We would like your participation again as it is important to understand how people's economic situation changes over time.

For this interview, we would like you to share your opinions using a web survey. Recently, we sent you a letter with access information to take the survey online and that access information is below. Please type the survey link provided below into your web browser and enter the Login ID to complete the survey at your earliest convenience. As before, this survey should take approximately 15 minutes to complete.

Survey web link: umsurvey.umich.edu
Login ID: DEC0219C



This will take you to the web survey!

If you have already completed the survey, we thank you for your participation. All information provided will be kept strictly confidential. No identifying information will ever be released to anyone.

Should you have questions regarding the survey content or website access, please contact the Surveys of Consumers at umich.soc@umich.edu. You may also call us at 1-866-989-0051 and leave us a message and we will return your call as quickly as possible.

Thank you again for all the help you have given us, and for your willingness to take part in this follow-up survey.

Sincerely,

Joanne Hsu
Director, Surveys of Consumers
University of Michigan

Spanish Mail Reminder (recontact sample)

4 de diciembre de 2023

202312-50007

SURVEYS OF CONSUMERS RESPONDENT
XXXX ST
TOWN, MI XXXXX-XXXX

Estimado/a Osirs:

Hace seis meses, usted participó en una encuesta para el Estudio de Consumidores de la Universidad de Michigan. La encuesta muestra cómo los cambios recientes en las condiciones económicas han afectado a personas como usted. Nos gustaría contar con su participación nuevamente ya que es importante entender cómo la situación económica de la gente cambia con el paso del tiempo.

Para esta entrevista, nos gustaría que usted comparta sus opiniones usando una encuesta web. Hace poco, le enviamos una carta con la información de acceso para completar la encuesta en línea, la cual se encuentra abajo. Por favor ingrese el enlace proporcionado a continuación en su navegador web, e ingrese el ID de inicio de sesión para completar la encuesta cuando le sea posible. Como antes, esta encuesta le tomará aproximadamente 15 minutos.

Enlace a la encuesta: umsurvey.umich.edu
Identificación (ID) de inicio de sesión: DEC0219C



¡Esto le llevará a la encuesta web!

Si usted ya ha completado la encuesta, le agradecemos por su participación. Toda la información que usted provee se mantendrá de manera estrictamente confidencial. No divulgaremos a nadie ninguna información que pudiera identificar a los participantes.

Si usted tiene preguntas acerca del contenido de la encuesta o sobre el acceso a la página de web, por favor no dude en contactar la Encuesta de Consumidores al umich.soc@umich.edu.

Gracias nuevamente por toda la ayuda que nos ha brindado, y por estar dispuesto/a a tomar parte en esta encuesta de seguimiento.

Atentamente,

Joanne Hsu
Director de la Encuesta de
Consumidores
Universidad de Michigan

Email Invitation (recontact sample only)

- Subject: Tell us about your opinions of the economy
- Body:
Dear {{RFNAME}},

Six months ago, you participated in a web survey for the University of Michigan's Surveys of Consumers. The survey shows how recent changes in economic conditions have affected people like you. We would like your participation again as it is important to understand how people's economic situation changes over time. Please click on the link below to start the survey,

<https://umsurvey.umich.edu/Logon>

And enter the Login ID to complete the survey.

Login ID: {{PW}}

No one else can substitute for you in this research. This survey should take approximately 15 minutes to complete. As before, this survey is completely voluntary and confidential. No identifying information will ever be released to anyone.

Should you have questions regarding the survey content or website access, please email us at umich.soc@umich.edu. You may also call our office at 1-866-989-0051 and leave a message with your name and number and someone will promptly return your call.

We appreciate your time and consideration in completing the survey. Thank you again for all the help you have given us, and for your willingness to take part in this follow-up survey.

Sincerely,
Joanne Hsu
Director, Surveys of Consumers
University of Michigan

P.O. Box 1248
Ann Arbor, MI 48106-9952
1-866-989-0051
umich.soc@umich.edu

Email Reminder 1 (recontact sample only)

- Subject: Please tell us about your opinions of the economy
- Body:
Dear {{RFNAME}},

Thank you for your continued participation in the University of Michigan's Surveys of Consumers. You should have received an invitation to our web survey last week. Your responses to this survey are very important and will help us understand how recent changes in economic conditions have affected people. Taking part in the study will ensure that the data are representative of all people. No one else can substitute for you in this research.

This survey will take approximately 15 minutes to complete depending on your responses. Please click on the link below to start the web survey,

<https://umsurvey.umich.edu/Logon>

And enter the Login ID to start the survey.

Login ID: {{PW}}

All information that you provide will be used for research purposes only and will be kept strictly confidential. Should you have questions regarding the survey content or website access, please send us an email at umich.soc@umich.edu. You may also call our office at 1-866-989-0051 and leave a message with your name and number and someone will promptly return your call.

Thank you again for all the help you have given us, and for your willingness to take part in this follow-up survey.

Sincerely,
Joanne Hsu
Director, Surveys of Consumers
University of Michigan

P.O. Box 1248
Ann Arbor, MI 48106
1-866-989-0051
umich.soc@umich.edu

Email Reminder 2 (recontact sample only)

- Subject: Last contact: tell us about your opinions of the economy
- Body:
Dear {{RFNAME}},

Thank you for your continued participation in the University of Michigan's Surveys of Consumers. This is the last reminder message regarding your opportunity to participate in the University of Michigan's Surveys of Consumers study. Your responses to this survey are very important and will help us to understand how recent changes in economic conditions have affected people. Taking part in the study will ensure that the data are representative of all people.

Thank you if you have already completed the survey. If you have not, please complete it at your earliest convenience. This survey will take approximately 15 minutes to complete depending on your responses. Please click on the link below to start the survey,

<https://umsurvey.umich.edu/Logon>

And enter the Login ID to start the survey.

Login ID: {{PW}}

All the information provided will be kept strictly confidential. No identifying information will ever be released to anyone. Should you have questions regarding the survey content or login access, please email us at umich.soc@umich.edu. You may also call our office at 1-866-989-0051 and leave a message with your name and number and someone will promptly return your call.

Thank you again for all the help you have given us, and for your willingness to take part in this follow-up survey.

Sincerely,
Joanne Hsu
Director, Surveys of Consumers
University of Michigan

P.O. Box 1248
Ann Arbor, MI 48106-9952
1-866-989-0051
umich.soc@umich.edu

2.5. Questionnaires

The questionnaires for phone and web interviews can be found on the Surveys of Consumers [data website](#). The web questionnaire is designed for use on both large computer monitors and small screens like smartphones.

2.6. Response Rates

2.6.1. Overall Response Rates

For the telephone surveys, we aim for monthly response rates of 5% for fresh interviews and 58% for recontact interviews. Table 2 presents the monthly response rates for the fresh and recontact interviews for the period between April 2021 and November 2023.

Table 2. Surveys of Consumers ABS Web Survey Response Rates

Sample Type	Mean	Min	Max	Monthly Standard Deviation
Fresh	3.6%	2.6%	4.2%	0.5%
Recontact second interviews	46.5%	38.4%	58.0%	5.3%
Recontact third interviews	67.8%	46.2%	80.4%	7.6%

Response rates are calculated using AAPOR's Response Rate 2 (RR2) formula (<https://aapor.org/wp-content/uploads/2023/05/Standards-Definitions-10th-edition.pdf>)

2.6.2. Methods to Enhance Response Rates

Throughout its history, the Surveys of Consumers have aimed to balance on-time completion of the targeted number of interviews and survey costs. As part of this, over the course of the last decade, we have used randomized experiments to investigate the impact of numerous survey design factors that have been shown through outside research to enhance response rates. In our web survey experiments, these factors included offering prepaid cash incentives and varying incentive amount, number of reminders, format of the reminders, the amount of contact information requested, offering multiple survey response options, and offering QR scan codes. The investigation outcomes included response rates, web completion rates where applicable, speed of completions, socio-demographic distribution differences and substantive result differences.

Drawing from lessons from this body of research, our web survey protocol currently includes one invitation letter, one follow-up letter, and no monetary incentives for the fresh and recontact samples. The contact strategy is supplemented by email invitations and follow-ups for the recontact sample that provided email addresses in previous interviews.

3. Data Editing Procedures in Web Surveys

3.1. Resolving Complete Cases

Classifying telephone interviews as partial or complete is relatively straightforward due to the sequential progression of the interview. For web surveys, we review web interview data and use specific rules based on the degree of completeness of specific questionnaire sections to determine each interview's completeness status as partial or complete.

All cases that log in successfully into the interview website are reviewed daily to determine their completeness status. Note that once a sampled person logs into the survey, they will have until the end of the month to complete it. While respondents do have the opportunity to complete the survey in multiple sessions within this time frame, very few respondents choose to do so.

We have four missingness criteria that are created based on responses to the five questions in the sentiment index, other key interview questions, questions used for weights calibration, and socio-demographic questions. Based on these set of rules, the expected percentage of partials that do not meet the completeness criteria is 14% for a given month; these cases will be excluded from further analysis. Ongoing quality control procedures include monitoring this percentage on a daily basis.

3.2. Reviewing Outliers

Numeric response distributions are reviewed during the daily data processing and biweekly reporting periods. The review is comprehensive and takes the entire interview into account.

3.3. Open-ended Response Coding

Web open-ended responses are coded daily by two coders with a 10% overlap to review the coder reliability. A third coder reviews and resolves any discrepancies between coders. Ongoing quality control procedures include the monitoring of the monthly percentage of discrepancies.

4. Method Effects

4.1. Method Effects

The differences between the survey estimates using the RDD cell phone data and ABS web data are due to a number of factors that are discussed in the previous sections:

- Sample Design
- Recruitment Protocol
- Data Collection Protocol
 - Self-administered vs. Interviewer Administered
 - Survey Response Mode
 - Questionnaire
- Data Editing Protocol

Method effects will vary across survey questions and measures, and we conceptualize the role of method effects across the transition period as follows. A variable-by-variable comparison of the two methods are available on the Survey Information part of the Surveys of Consumers [data website](#).

4.2. Mathematical Representation of Expected Method Effects on the Estimate of Change across Time

4.2.1. Defining the Method Effect and Its Empirical Evaluation Using Two Parallel Time Series

The method effect (M_W) can be quantitatively represented by the difference in expected values of estimators that use different data collection methods over the same time period:

$$E(\hat{\theta}_{t,W}) - E(\hat{\theta}_{t,T}) = M_W, \text{ where}$$

$\hat{\theta}_{t,W}$: estimator for a target population parameter using web survey data at month t

$\hat{\theta}_{t,T}$: estimator for a target population parameter using telephone survey data at month t

M_W : method effect due to the difference between web and telephone survey methods

The expectation is taken over sampling, nonresponse, and response mechanisms for a given item in the questionnaire and for a given a time period. In this representation, we are choosing the time period as a month.

This assumes that the discrepancy between the expected value of web and telephone survey estimators, considering all possible samples, respondent subsets, and response distributions for a specific item during a given time period, remains constant. The many strong time series correlations seen in our data support this assumption. We refer to this constant as the method effect. In this context, the telephone survey estimates are taken as the benchmark. When assuming M_W is constant for a given time period, one can estimate variable-specific method effects. Using data from two parallel time series for each item, we observe average method effects of -6.6 percentage points for the Index of Consumer Sentiment and -13.6 for the Current Economic Conditions Index.

Next, we will discuss how method effects may influence the calculated change between two time periods, focusing on the transition period in which the proportions of telephone and web data are adjusted over four months.

4.2.2. Impact of Method Effect on Change Estimator

With the assumption of a constant method effect, the expectation of change estimator between two time periods, when conditioned on the same method, remains unaffected:

$$E(\hat{\theta}_{t+1,W} - \hat{\theta}_{t,W}) = \Delta$$

$$E(\hat{\theta}_{t+1,T} - \hat{\theta}_{t,T}) = \Delta$$

However, a transition from telephone to web surveys results in:

$$E(\hat{\theta}_{t+1,W} - \hat{\theta}_{t,T}) = \Delta + M_W$$

$$E(\hat{\theta}_{t+1,W} - \hat{\theta}_{t+1,T} + \hat{\theta}_{t+1,T} - \hat{\theta}_{t,T}) = E(\hat{\theta}_{t+1,T} - \hat{\theta}_{t,T}) + E(\hat{\theta}_{t+1,W} - \hat{\theta}_{t+1,T}) = \Delta + M_W$$

To avoid break in the time series, M_W will be gradually introduced over four survey report periods:

From March to April, the estimated difference becomes:

$$E(0.75(\hat{\theta}_{t+1,T}) + 0.25(\hat{\theta}_{t+1,W}) - \hat{\theta}_{t,T}) = \Delta + 0.25M_W$$

From April to May, the estimated difference becomes:

$$E(0.50(\hat{\theta}_{t+1,T}) + 0.50(\hat{\theta}_{t+1,W}) - 0.75(\hat{\theta}_{t,T}) - 0.25(\hat{\theta}_{t,W})) = \Delta + 0.25M_W$$

From May to June, the estimated difference becomes:

$$E(0.25(\hat{\theta}_{t+1,T}) + 0.75(\hat{\theta}_{t+1,W}) - 0.50(\hat{\theta}_{t,T}) - 0.50(\hat{\theta}_{t,W})) = \Delta + 0.25M_W$$

From June to July, the estimated difference becomes:

$$E(\hat{\theta}_{t+1,W} - 0.25(\hat{\theta}_{t,T}) - 0.75(\hat{\theta}_{t,W})) = \Delta + 0.25M_W$$

By July to August, the estimated difference is no longer affected by the method effect M_W :

$$E(\hat{\theta}_{t+1,W} - \hat{\theta}_{t,W}) = \Delta$$

In summary, in the four month period between April and July, the month-to-month change estimate will incrementally incorporate one-quarter of the method effect per survey report. For illustrative purposes, if the consumer sentiment index exhibited an average method effect of -6.6 percentage points, then a positive month-to-month change would be underestimated by about 1.65 (one-quarter of 6.6) during a rise, and a negative change would be overestimated by 1.65. Thus, we recommend that data users take a more conservative approach to interpreting change estimates throughout this transition period.

5. Weighting and Variance Estimation

5.1. Sample Design Overview

The telephone and web surveys are both designed to be rotating panel sample surveys. Each month, part of the sample is fresh (that is, an independently drawn cross-sectional sample), and the remainder from participants who completed an interview 6 months prior. A respondent can be interviewed up to 3 times, each 6 months apart.

Telephone surveys use an RDD cell sampling frame, for which we assume a one-to-one link between the person and the cell phone. Web surveys use an ABS frame, for which we assume a one-to-one link between the household and postal address. SOC computes both household- and adult-level survey weights that compensate for unequal selection probability, coverage, and nonresponse.

The household weights are designed to yield a representative sample of all U.S. households; the adult weights are designed to yield a representative sample of all adults living in private households. The choice between these weights depends solely on the objectives of the data user. This choice is not equivalent to the difference between the measurement of household characteristics (e.g. size, location, income, wealth), and characteristics of individuals (e.g. attitudes, expectations, education, employment, wages). Rather, the choice of weights depends on the preferred unit of analysis or “population” which the sample results are intended to represent. For example, studies of population attitudes often use “adult” weights to examine the prevalence and dynamics of attitude change among individuals; studies of economic behavior often use “household” weights, reflecting an interest in the household as the appropriate decision making unit for analysis.

In the RDD cell phone surveys, the following rules have been used to designate a member of the household as the “household head”: 1) male or an unmarried and unpartnered female respondent is the household head, 2) female respondent in same-sex marriage or relationship is the household head, and 3) female respondent married to or partnered with a male respondent is wife/partner of a household head. Given these rules, a respondent could be a household head, wife/partner of a household head, or in some relation to household head. The household weights apply to only household heads and spouse/partner of a household head as they are determined as the household decision makers. According to this description, adult children are also considered to be appropriate reporters and there is no need for further weight adjustment for proxy reporters. In contrast, the household head definition in the ABS web surveys largely excludes adult children who reside with their relatives.

Weighting adjustments are followed each step described in section 5.2 separately for phone and web interview data.

5.2. Weighting Adjustments

5.2.1. Weight Adjustment for Unequal Selection Probabilities

In the RDD cell telephone frame the first level selection is adults. Assuming a one-to-one link between an adult and a cell telephone number, RDD cell telephone numbers are assumed to be drawn at adult level. The selection weights by sampling frame and household telephone ownership are shown in Table 3.

Table 3. Household and Adult Weight Adjustment by Sampling Frame and Household Telephone Ownership in a RDD Cell Phone Sample Design

Domain	Sampling frame	
	C- frame	
	Household	Adult
Landline phone only households (L-O)	-	-
Cell phone only households (C-O)	$w_i = \frac{1}{\pi_c} \frac{1}{(C_i)}$	$w_{ij} = \frac{1}{\pi_c}$
Landline and cell phone households (L&C)	$w_i = \frac{1}{\pi_c} \frac{1}{(C_i)}$	$w_{ij} = \frac{1}{\pi_c} \frac{1}{(1)}$

N_i : number of households in household i . $N_i = (1,2,3,4,5,6,1=7 \text{ or more})$

C_i : number of cell phones in household i , excluding cell phones assigned to children (17 and younger) and business. $C_i = (1,2,3,4,5,6,7=7-15, 1=16 \text{ or more})$

π_c : probability of selecting a line from Cell RDD sampling frame

In the ABS frame, the first level selection is household. Assuming a one-to-one link between a household and a postal address, ABS postal addresses are household level. The selection weights by sampling frame and household telephone ownership are shown in Table 4.

Table 4. Household and Adult Weight Adjustment by Sampling Frame and Household Telephone Ownership in an ABS Web Survey Sample Design

Domain	Sampling frame	
	ABS- frame	
	Household	Adult
Landline phone only households (L-O)	$w_i = \frac{1}{\pi_A}$	$w_{ij} = \frac{1}{\pi_A} \frac{1}{(N_i)}$
Cell phone only households (C-O)	$w_i = \frac{1}{\pi_A}$	$w_{ij} = \frac{1}{\pi_A} \frac{1}{(N_i)}$
Landline and cell phone households (L&C)	$w_i = \frac{1}{\pi_A}$	$w_{ij} = \frac{1}{\pi_A} \frac{1}{(N_i)}$

N_i : number of households in household i . $N_i = (1,2,3,4,5,6,1=7 \text{ or more})$

C_i : number of cell phones in household i , excluding cell phones assigned to children (17 and younger) and business. $C_i = (1,2,3,4,5,6,7=7-15, 1=16 \text{ or more})$

π_A : probability of selecting a line from ABS sampling frame

5.2.2. Weight Adjustment for Coverage, Survey Nonresponse and Panel Attrition

Corrections for method coverage, survey nonresponse, and panel attrition are introduced through raking by selected demographic characteristics (Binder and Theberge, 1988). Data from the Current Population Surveys conducted by the Census are used to adjust for variations in the selected demographic distributions observed in the monthly samples.

The fresh and recontact portions of the sample are raked separately. This permits the construction of weights designed for analyses based solely on cases in either portion of the sample. The separate raking also explicitly recognizes the underlying differences between initial refusals and panel attrition.

5.2.3. Weight Adjustment for Rotating Panel Design

The rotating panel design offers important statistical advantages for the measurement of change over time. The statistical advantage stems from the reduction in the standard errors of the observed differences in observed means between two overlapping samples as compared with two independent samples. The variances of the estimated differences over time are reduced to the extent that the repeated measures in the recontact portion of the sample are positively correlated. Due to the correlation, each case in the recontact portion of the sample contributes less to the variance (by one minus the correlation coefficient) than cases from the fresh sample.

To take advantage of this variance reduction feature, the weights given to the fresh cases are decreased relative to the recontact cases so as to achieve estimates of differences with minimum variance (Kish, 1965; 1987). The weight factor used is based on the average correlation among the five questionnaire items used to construct the Index of Consumer Sentiment. When the correlation is zero, each portion of the sample is given equal weight; as the correlation increases, the relative weight given to the fresh portion of the sample decreases.

5.2.4. Weight Trimming

Weights larger than 10 are set to 10. Final weights are based on bracketing the weights into quintiles.

5.3. Software for Computing Variances

The SOC weight adjustment includes base weight adjustments and calibration to a target population. Therefore, the data users should use linearized estimator for the variance computations (Wolter, 2007 ; Valliant and Dever, 2018). While the specialized survey procedures in commonly used software or packages such as SAS®, and R include linearized estimator, STATA® recently incorporated linearized estimator computations across all analysis procedures.

Appendix Table 1. Recommended Allowance for Sampling Error of a Percentage (Sampling Error Allowance in Percentage Points)

For Estimated Percentage Near	Number of Interviews											
	100	200	300	400	500	750	1000	1250	1500	2000	2500	3000
1% or 99%	2.20	1.60	1.30	1.10	1.00	0.80	0.70	0.60	0.60	0.50	0.40	0.40
5% or 95%	4.90	3.50	2.80	2.40	2.20	1.80	1.50	1.40	1.30	1.10	1.00	0.90
10% or 90%	6.70	4.80	3.90	3.40	3.00	2.40	2.10	1.90	1.70	1.50	1.30	1.20
20% or 80%	9.00	6.30	5.20	4.50	4.00	3.30	2.80	2.50	2.30	2.00	1.80	1.60
30% or 70%	10.30	7.30	5.90	5.10	4.60	3.70	3.20	2.90	2.60	2.30	2.00	1.90
40% or 60%	11.00	7.80	6.30	5.50	4.90	4.00	3.50	3.10	2.80	2.40	2.20	2.00
50%	11.20	7.90	6.50	5.60	5.00	4.10	3.50	3.20	2.90	2.50	2.20	2.00

The figures in this table represent two standard errors. Hence, the chances are 95 in 100 that the true percentage lies within a range equal to the observed percentage, plus or minus the sampling error.

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