Maximizing Web Survey Response: Research from the Current Employment Statistics Survey November, 2016

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Abstract

The Current Employment Statistics (CES) program of the U.S. Bureau of Labor Statistics (BLS) is a monthly multi-modal establishment survey that measures employment, hours and earnings for nonfarm payrolls. Sixteen percent of CES survey reports are completed online through the BLS web system; however, these respondents represent 36 percent of total reported employment for CES. This underscores the need to maintain high response rates for these web reports, which can be a challenge for any self-reporting method.

This paper reviews some of the steps taken to maximize response from CES web respondents and then analyzes new empirical research performed using CES web survey response data. Utilizing 40,000 CES web respondents for this research, we will attempt to determine how best to prompt respondents for monthly data entry. Consideration will be given to the timing of e-mail prompts sent to respondents, time zone effects, firm size and industry classification.

This review has implications not only for prompting web respondents but we posit that by measuring the response on a self-reported method, we are discovering the revealed preferences of respondents for other data collection modes as well.

Key words: response, respondent, mode, employment

1. Background

The Current Employment Statistics (CES) program[2] of the U.S. Bureau of Labor Statistics (BLS) is a monthly establishment survey that measures employment, hours, and earnings for nonfarm payrolls[3]. These data are released as part of the Employment Situation, commonly referred to as the Jobs Report[4].

CES collects data monthly from a sample of approximately 146,000 businesses and government agencies, representing more than 623,000 individual worksites. This multi-modal survey utilizes Computer Assisted Telephone Interviewing (CATI), web, Electronic Data Interchange (EDI), Touchtone Data Entry (TDE) and fax to collect 96% of the

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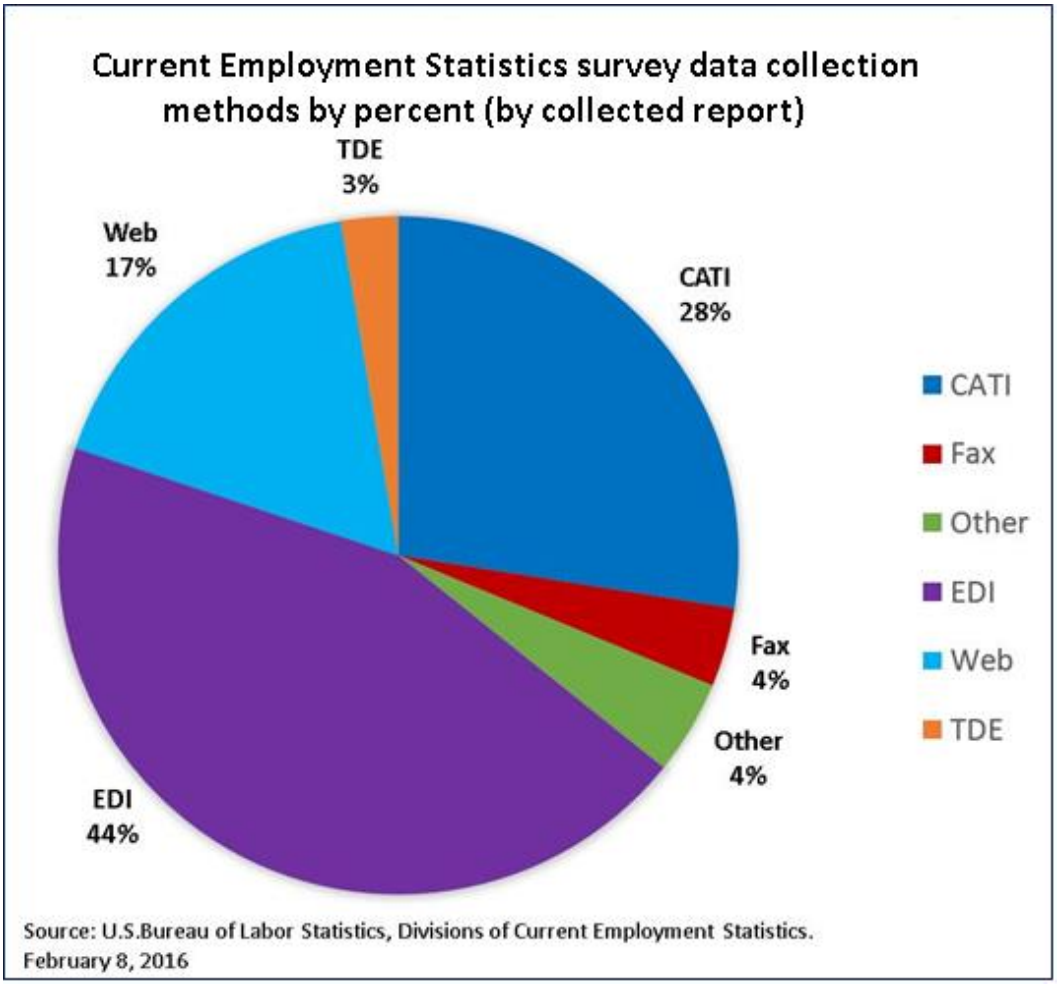
[2] CES national website: http://www.bls.gov/ces/

[3] The BLS *Handbook of Methods* (chapter 2) provides information on the CES survey and the methods used to produce survey estimates: http://www.bls.gov/opub/hom/pdf/homch2.pdf

[4] The jobs report, published in *The Employment Situation* each month, can be found at http://www.bls.gov/ces/news.htm

worksites in the CES sample. The remaining 4% of data are collected by special arrangement, including a small number of reports received by mail.

Seventeen percent of CES survey reports are completed online through the BLS web system; however, these respondents represent 36 percent of total reported employment for CES. This underscores the need to maintain high response rates for these web reports, which can be a challenge for any self-reporting method.



This paper reviews some of the steps taken to maximize response from CES web respondents and then discusses new empirical research performed using CES web survey response data. Consideration will be given to the timing of e-mail prompts sent to respondents, establishment size and industry classification. The goal of this research is to identify improved guidelines for prompting (i.e. reminding) respondents to provide data in a timely manner.

2. CES Data Collection Background

CES uses Computer Assisted Telephone Interviewing (CATI) to enroll new sample units and collect data for an initial period of five months. During the fifth month collection call, the BLS interviewer determines if the respondent is eligible for CES web data collection. If the respondent is offered web and declines, or if the interviewer determines web is not appropriate in the situation, CES will continue to collect using CATI. Web collection is advantageous for CES as it has much lower costs per collected unit than CATI.

CES relies on a browser based web collection instrument, known as 'Web Lite,' that does not require a password to log-in. Because the respondent can access the site without a password, no confidential information, including any firm identifying information, is displayed in the application. Links that are provided to respondents contain a unique report number which allows BLS to track the identity of the respondent and link the data collected to the proper business establishment. This method was developed to replace the previous web collection instrument that required a user name and password for log-in. The new method reduced a barrier to data collection (i.e. remembering a password) and was found to increase response rates.

BLS sends a series of reminder e-mails to each web sample unit. The first reminder, sent on the 12th of each month, serves as an advance notice to the respondent to provide data as soon as it becomes available. The e-mail contains a link that takes the respondent directly into the collection instrument.

If data are not received on a timely basis, BLS provides follow up reminders to respondents by both e-mail and phone. The first reminders, which are known as nonresponse prompts, are e-mailed with a little more than a week left in the current collection month. These e-mails provide a reminder to submit data and include a link to the website embedded with the report number information.

Several days after the nonresponse prompt is e-mailed, a team of interviewers at a CES Data Collection Center (DCC) place phone call reminders to respondents who have still not submitted data. This call serves only as a reminder and is not an attempt to collect data via CATI. However, if the respondent prefers to provide data by phone then the interviewer can collect data and transfer the case back to CATI for future months.

Finally, on the last collection day of each month, CES sends a last chance e-mail reminder. These e-mails explain that this is the final day on which data can be submitted to be included in the first release of data for that month. These e-mails also contain a link that takes the respondent directly into the collection instrument.

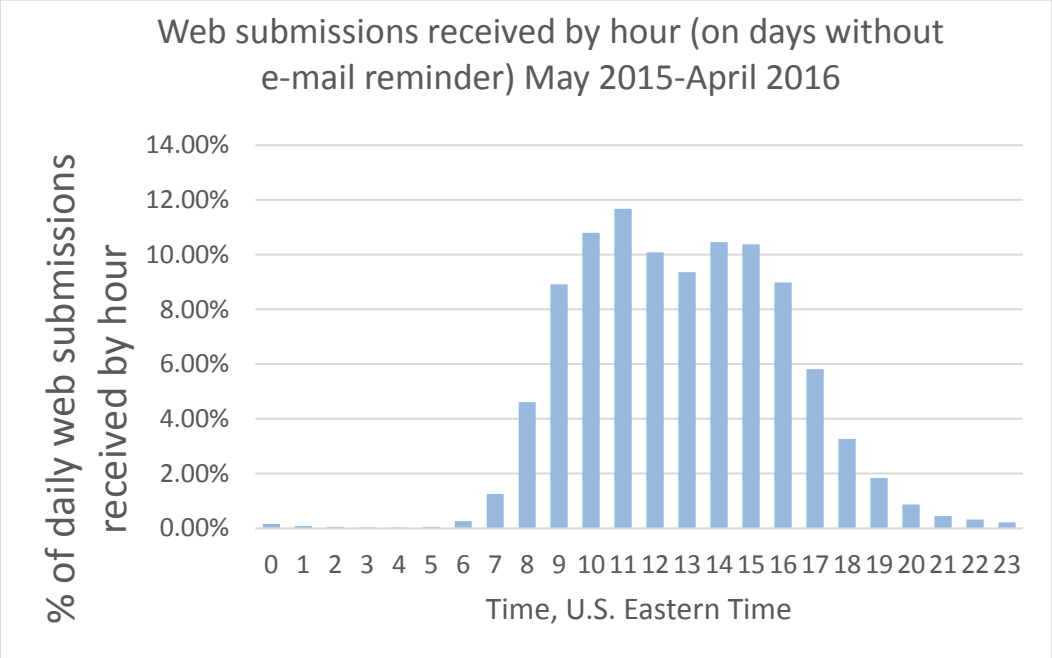
One of the advantages of web data collection is the flexibility provided to respondents to submit data on their own schedule. The "always on" nature of web data collection also provides us with information on when respondents choose to provide data. This information, one would surmise, could be useful in determining the timing of web reminder e-mails.

Additional information on the history of and improvements to data collection for the CES survey is provided by Robertson and Hatch-Maxfield[i] and Johnson[ii].

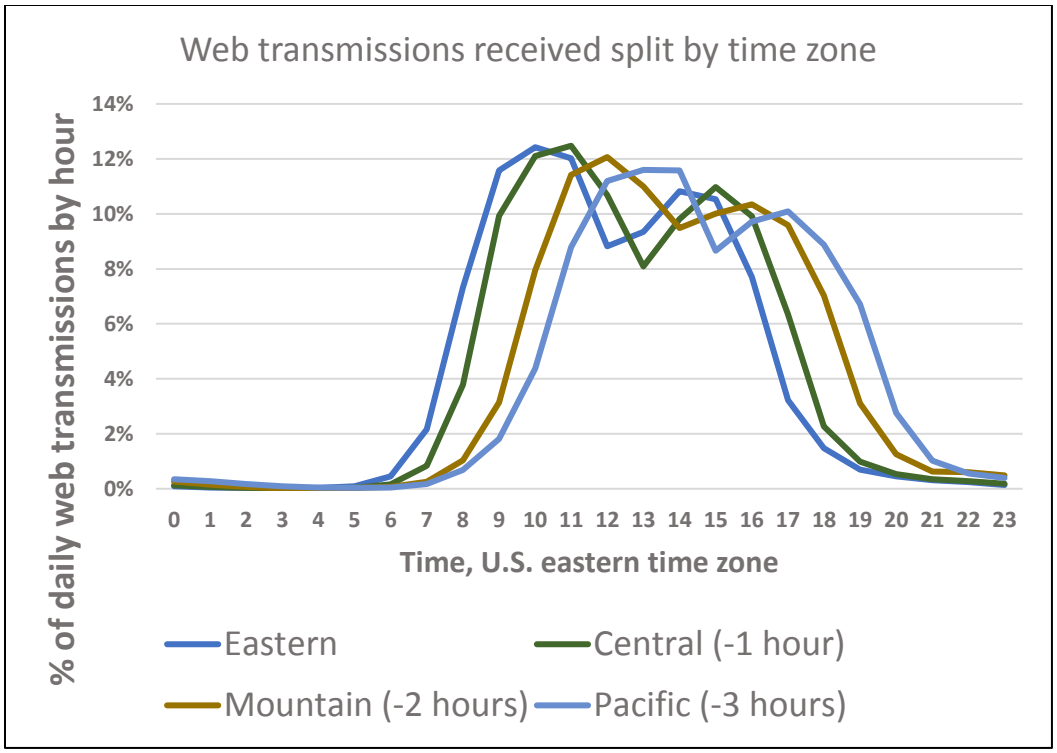
3. Research on timing of web response

CES staff extracted data on the time that respondents submitted data by web for the twelve collection months from May 2015 to April 2016. These data contain approximately 500,000 individual reports, or an average of more than 40,000 per month. Web transmissions traditionally spike whenever e-mail reminders are sent. For this reason, we excluded all transmissions received on days that an e-mail reminder was sent, leaving us with a little more than 300,000 reports submitted during that twelve month period. The chart below includes these transmissions by hour of the day received by BLS (U.S. Eastern Time).

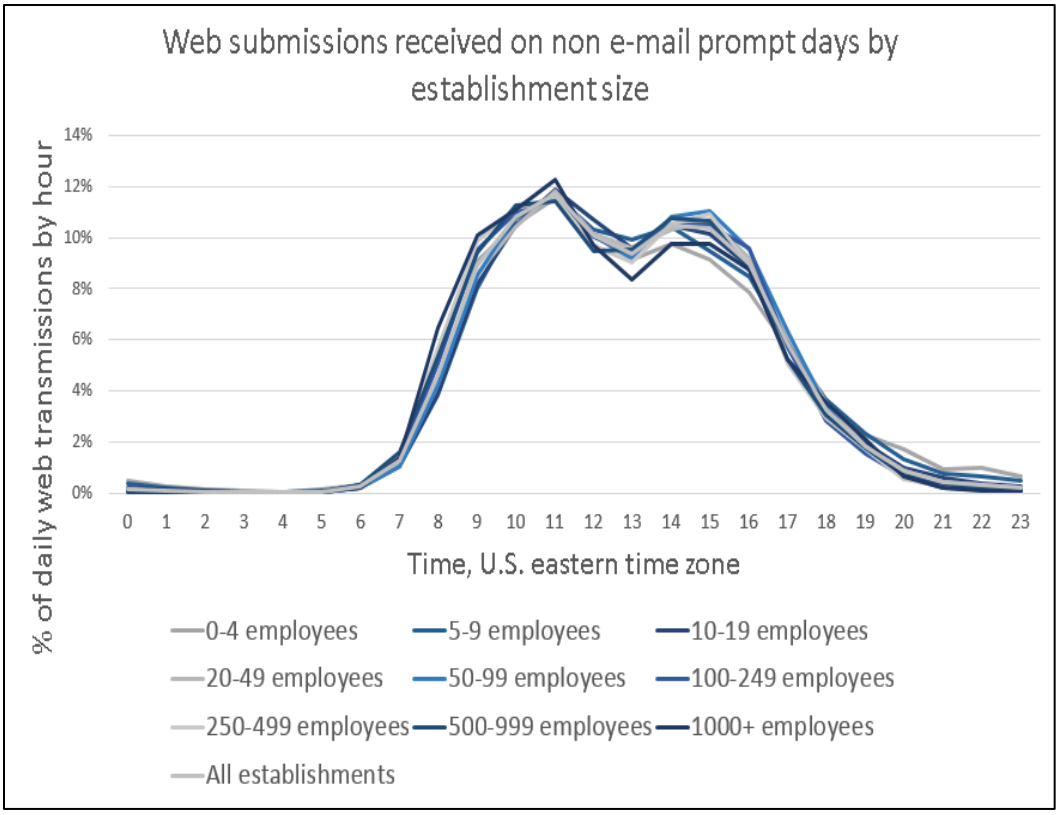
As one would expect, activity is light overnight and picks up as the traditional business day begins. Web transmissions peak from 11-12 in the morning before slowing slightly over lunch and then picking up again for a second peak from 2-4 in the afternoon. This bimodal distribution provides us with insight on when our respondents find time in their day to provide data.



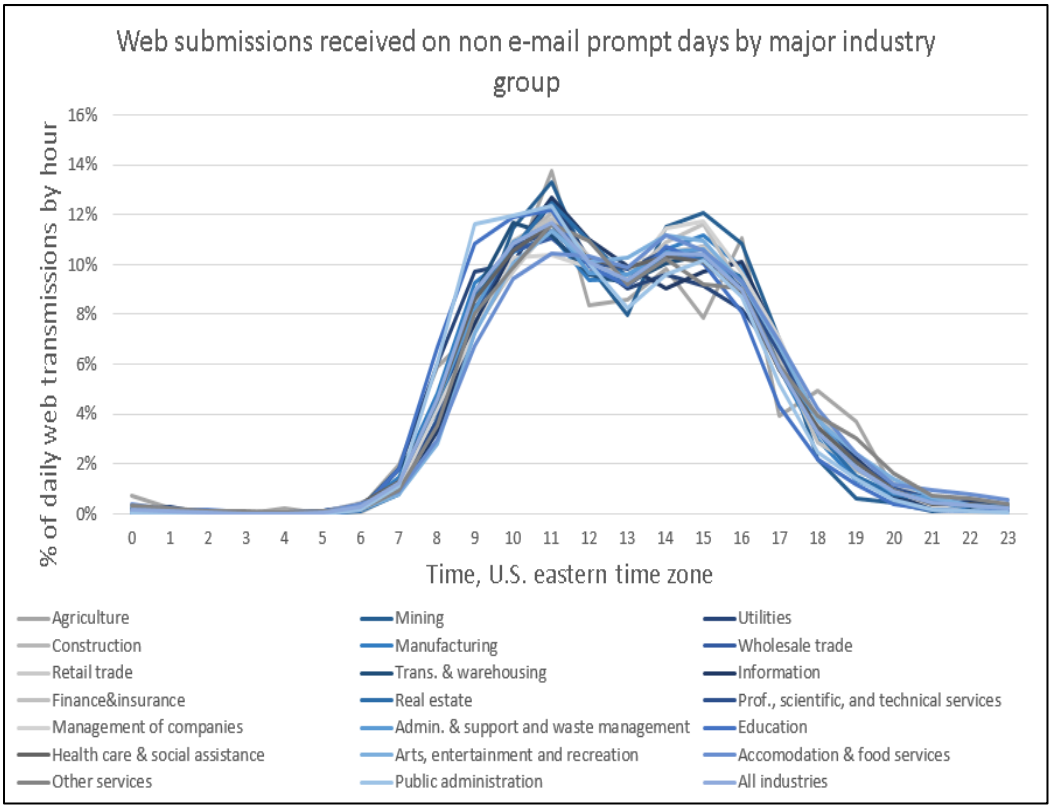
Up to this point, we have simplified the analysis by ignoring the fact that the continental United States has four time zones. When we separate transmissions by the time zone of the respondent, the peak of each time zone is offset by an hour. Each time zone has peak response at 10 in the morning local time. This result is expected as respondents are submitting data on their schedule, which, on average, should be about the same regardless of time zone.



Another characteristic of interest is the employment size of the establishment. CES groups establishments by nine size classes. The following chart splits these web transmissions by size class and demonstrates the similarity across size classes. This result is unexpected as we anticipated there would likely be a significant difference at least between the smallest size class and the larger size classes. The typical respondent for the smallest size class is the business owner, while the typical respondent for a larger establishment is an accountant in the payroll department. We had hypothesized that owners, who typically work longer and more irregular hours, would transmit data on a different schedule than the typical payroll accountant. The correlation exceeds .99 for each size class when compared to all size class data.



The final characteristic of interest evaluated was the industry classification of the establishment. Web transmission times were compared for establishments grouped by twenty major industry groups. There was an expectation that industries, which vary greatly in traditional work hours, would have peak response at different parts of the day. For example, we would expect the construction industry, which typically maintains earlier office hours to peak earlier than the Accommodation and Food Services industry. However, the results show a nearly identical pattern across industry groups as shown in the following chart. Again, all groups are highly similar with a correlation exceeding .96 for each industry group when compared to the all industry group.

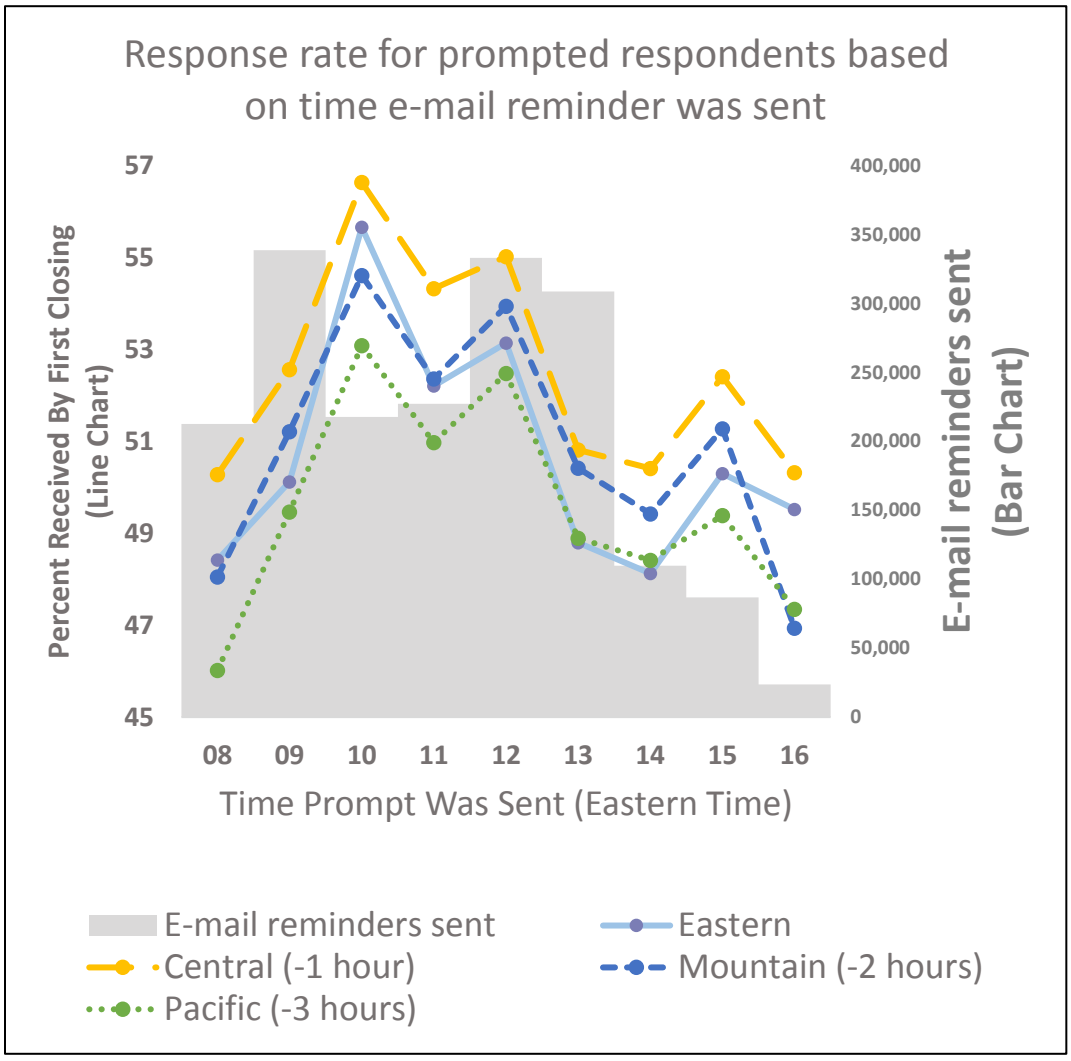


The results of the research have been somewhat surprising in so far as there is essentially no difference in respondent time preferences across establishment size or industry. We have been able to eliminate a number of complicating factors that will not need to be considered when designing a prompting schedule. These findings lead us to another research question, how does response vary depending on the time of day that we remind respondents to provide data? Remember that to this point we have only been evaluating response on non-prompt days, with the goal of finding the ideal time for respondents to provide data. Now we are interested in reviewing how response is impacted on days when CES *does* send e-mail reminders.

Recall that respondents are sent up to three reminder e-mails per monthly collection cycle. This includes the advanced notice on the 12th, a nonresponse prompt about two weeks later and finally a last chance reminder on the last day of collection. Ideally, we would be able to measure the success of these e-mail reminders based on the time of day that these were sent. As it turns out, we already had the data available to perform this research.

The nonresponse prompt e-mail, sent to respondents who have not yet provided data with about a week to go in the collection month, is scheduled each month on a specific day. However, there had been no set time of day for sending these e-mails. Although the computer system that generates and sends these reminder e-mails is automated, the process does not begin until the CES data collection staff manually kicks off the program. For this reason, the times that the e-mails were actually sent range from 8 in the morning to 4 in the afternoon.

This natural experiment will allow us to measure response rates based on the time that the e-mail prompt was sent. The chart below provides the response rate of units by our first closing date that received the nonresponse e-mail reminder (i.e. excluding units that reported ahead of the e-mail reminder). Because we had earlier identified that respondents natural transmission activity was based on local time, we have separated respondents in this chart by time zone. The time along the x-axis is the Eastern Time zone (i.e. when the e-mail was sent). This is based on a five year time period from mid-2010 to mid-2015.



The results are a mix of expected and confounding. First, the results line-up fairly closely with what we observed earlier about respondents tendency to respond in late morning and then shortly after lunch. In this case, the e-mails sent out at 10-11 in the morning and then 12-1 in the afternoon form the bimodal peaks. This aligns well with the preferences respondents showed for reporting from 11-12 in the morning and then 2-4 in the afternoon. The e-mails arriving shortly ahead of these ideal time ranges results in peak response. Similarly, e-mails that arrive outside of that range, particularly early in the morning, seem more likely to get lost in respondents' inboxes.

The real surprise that we found in doing this research was that response peaked for the e-mails sent between 10-11 in the morning Eastern Time across all four time zones. These data have not been adjusted for time zone. The peak, and for that matter, the pattern of response throughout the day is nearly identical across time zones, but based on the Eastern Time zone. Respondents in the Eastern Time zone are most likely to respond when prompted at 10 local time, respondents in the central time zone are most likely to respond when prompted at 9 local time, and so on. Recall earlier that when not prompted, respondents generally submitted data an hour later as moving east to west through the time zones. However, when being prompted, the ideal time for all respondents is between 10-11 in the morning (Eastern Time zone).

4. Conclusion

This research was originally intended to serve as the basis to develop a complex algorithm for determining the ideal prompting time for all respondents based on time zone, industry, and size of establishment. However, results from this study suggest a much simpler response, all CES respondents should be prompted between 10-11 Eastern Time in the morning.

As a result of this study, CES immediately changed the timing of e-mail prompting to occur at 10 in the morning. Although it is too soon to tell whether this change increases response rates, we plan to monitor this closely over time.

These findings also suggest that CES could find it useful to evaluate timing effects of other collection methods, mainly CATI. Anecdotally, CES has found that some CATI interviewers report more success during the late morning and early afternoon time frames. Future research in CES may attempt to empirically evaluate this relationship to determine if any adjustments should be made to CATI collection schedules.

Any opinions expressed in this paper are those of the author and do not constitute policy of the Bureau of Labor Statistics.

Acknowledgement

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References

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