

Cognitive Economics Study: Development and Methodology

Version 1.0
November 2011

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Preface

This document serves as an introduction to the Cognitive Economics Study (CogEcon). It contains information about sample sizes, response rates, survey methodology and content development. The data files are described more fully in the *Cognitive Economics Study Overview and Data Description*.

This document combines content from the wave-specific documentation:

- Gwenith Fisher and Brooke Helppie McFall, “Cognitive Economics Study: 2008 Survey Data: Background, data description and usage.” September 30, 2009.
- Joanne W. Hsu and Brooke Helppie McFall, “Cognitive Economics Post-Crash Survey 2009: Survey and Data Documentation.” September 30, 2010.

Mike Gideon synthesized the material for the public use data documentation.

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I. Introduction

The Cognitive Economics Study (CogEcon) was designed by a team of economists to increase understanding of the cognitive bases of economic decisionmaking. This effort was led by Robert J. Willis of the University of Michigan-Ann Arbor, and made possible by a partnership with the Cognition and Aging in the USA Study (CogUSA). CogUSA investigators shared both the sample and their data.

Data from CogEcon can be merged with the rich cognitive and demographic data from CogUSA. The merged data provide a powerful tool for understanding the development of financial knowledge and financial decisionmaking among older adults in the United States.

CogEcon and CogUSA data must be obtained separately. There are additional details about merging the data in Section I.A.4. of the Data Description. For more information on the CogUSA study, please visit the website of the Unified Studies of Cognition (USC) at <http://kiptron.usc.edu>.

A. Background

The Health and Retirement Study¹ (HRS) was designed to provide academic researchers, policy analysts and program managers with reliable, current data on the economic and physical well-being of men and women 50 years of age and older in America. Co-investigators with the HRS, Robert J. Willis and Willard L. Rodgers, partnered with John J. McArdle of the University of Southern California (P.I. of the National Growth and Change Studies, NGCS²), to launch a new study called Cognition and Aging in the USA.

The CogEcon study was developed and launched as part of the Data Innovation Core of Robert J. Willis's program project (NIA P01 AG026571). In 2010 the program project was renewed, and it includes plans to field two more waves of the CogEcon study—CogEcon 2011 and CogEcon 2013.

B. Cognition and Aging in the USA (CogUSA) methodology

As of 2011, the CogUSA study consists of three interviews, as depicted in Figure 1. Interviews were conducted by staff from the University of Michigan's Survey Research Operations (SRO). Initial contact was established by telephone calls to selected households between June and December, 2007. The study began with a 40-minute telephone interview (Wave 1) that replicates the sections of the HRS questionnaire on

¹ "The HRS (Health and Retirement Study) is sponsored by the National Institute on Aging (grant number NIA U01AG009740) and is conducted by the University of Michigan."

² US National Growth and Change Studies (NGCS) refers to the program of research started at the University of Denver in 1978 by Jack McArdle and John Horn, and now located in the CogUSC Laboratory at the University of Southern California in Los Angeles. The main goal of these studies is to use all available collections of psychological tests to better describe and understand the many changes that seem to occur to people over the adult life-span (ages 18-95). To date, CogUSC research has been funded by the National Institute on Aging (NIA) and has probed deepest into the age-related growth and declines of adult intellectual functioning.

demography, health and cognition, and added a few brief cognitive tests that were not part of the HRS. This Wave 1 telephone interview was followed as quickly as possible—ideally, within a week—by a 3 hour face-to-face cognitive assessment (Wave 2) of the cognitive abilities of respondents on a large number of different tasks measuring components of fluid and crystallized intelligence. Finally, a second telephone survey (Wave 3) took place one to twenty-four months following the personal interview, at one of eight randomly assigned follow-up target dates. Wave 3 interviews began in January 2008 and continued through September 2009. (Randomizations for the Wave 3 telephone interview were done at the respondent, not household, level.)

Sample

The initial CogUSA sample consisted of 3224 individuals located in 28 primary sampling units (PSUs) across the nation. This sample was obtained from a two-stage random-digit-dial (RDD) sample. Households in 28 specific PSUs were then targeted using information from a Genesys database. CogUSA selected PSUs where HRS interviews are conducted in order to employ HRS interviewers and in an attempt to replicate the HRS sample demographics.

Individuals born in 1956 or earlier (i.e., age 51+) were eligible for the study, as were their significant others, regardless of age.

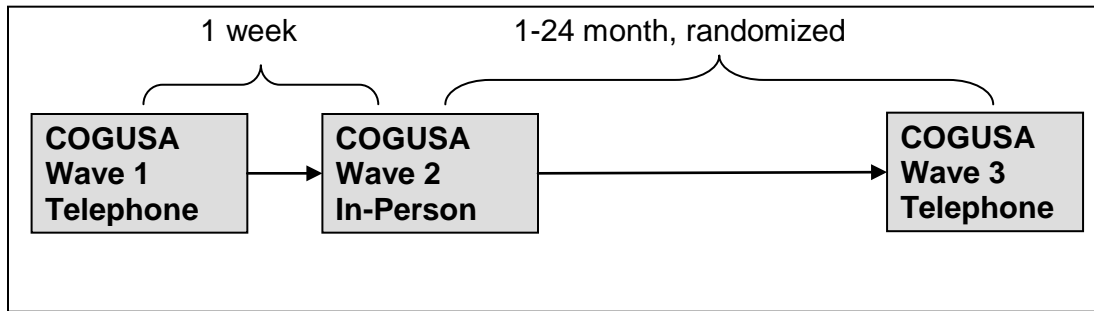
Response rates

Among the 3224 individuals asked to participate in the telephone interview, a total of 1514 individuals completed the Wave 1 interview, for an unadjusted response rate of 47%. Based on the National Study of Medical Decision Making and consultation with the Survey Research Center Statistical Design Group, CogUSA researchers anticipated a 45% response rate with this telephone list methodology, so the 47% response rate was slightly higher than anticipated. Among the 1514 individuals who completed a telephone interview in Wave 1, a total of 1230 individuals completed a face-to-face interview, for a response rate of 81%.^{3,4}

³ A non-response analysis examining characteristics of respondents vs. non-respondents indicated that completion of the Wave 2 interview was unrelated to cognition (word recall and serial 7s performance in the telephone interview), age, sex, race, coupleness, and overall self-rated health status ($p > .05$). Education was borderline statistically significant, $p = .0510$.

⁴ Among the 1230 individuals who completed a Wave 2 interview, 1224 were eligible for Wave 3. Six of the original CogUSA participants are also HRS participants (by coincidence) and were excluded from future CogUSA and CogEcon waves in order to avoid overburdening HRS panel respondents. Wave 3 interviews were completed with 1125 respondents, for an unadjusted response rate of 92%.

Figure 1: Fieldwork timing of CogUSA



II. CogEcon methodology

A. Initial sample

There were 1230 CogUSA participants who completed Wave 2. Eight were removed because they were HRS respondents. Therefore, the initial CogEcon sample consisted of the 1222 individuals who completed the face-to-face cognitive assessment (CogUSA Wave 2) and were not HRS respondents.⁵ These 1222 individuals were between 38 and 96 years old, with a mean age of 64.0 years old at the time of the first CogUSA survey.

B. CogEcon 2008: two releases & two modes

Of these 1222 CogUSA participants, 816—just over two-thirds of the sample—reported using the internet regularly.⁶ CogEcon 2008 was administered as both a mail and web questionnaire; we used this information about internet use to partition the sample. However, some people who were eligible to use the internet were given mail questionnaires in order to assess mode effects.

CogEcon 2008 was divided into two releases. 921 were assigned to the first release, and 301 were assigned to the second (See Figures 1 and 2). We assigned CogUSA participants to release 1 or release 2 depending on when they were randomly assigned to participate in CogUSA. The phasing of releases was designed to minimize respondent burden by creating a time gap of at least four weeks between any CogUSA interview and CogEcon 2008. The variable *cl_release* in the datasets indicates the release of which each respondent was a member.

Release 1: February (web) and March (mail)

The 921 individuals in Release 1 were divided into two groups: those who indicated in the baseline CogUSA interview that they used the internet “regularly,” and those who did not. The first of these groups (the “internet-eligible” group) was sent a letter inviting them to participate in a web survey. Those who did not report using the internet

⁵ HRS respondents were removed so that we would not burden respondents and potentially interfere with the HRS efforts.

⁶ The question used to determine eligibility was: “Do you regularly use the World Wide Web, or the Internet, for sending and receiving e-mail or for any other purpose, such as making purchases, searching for information, or making travel reservations?”

“regularly” (the “mail-eligible” group) were sent a letter with a mail version of the survey enclosed.

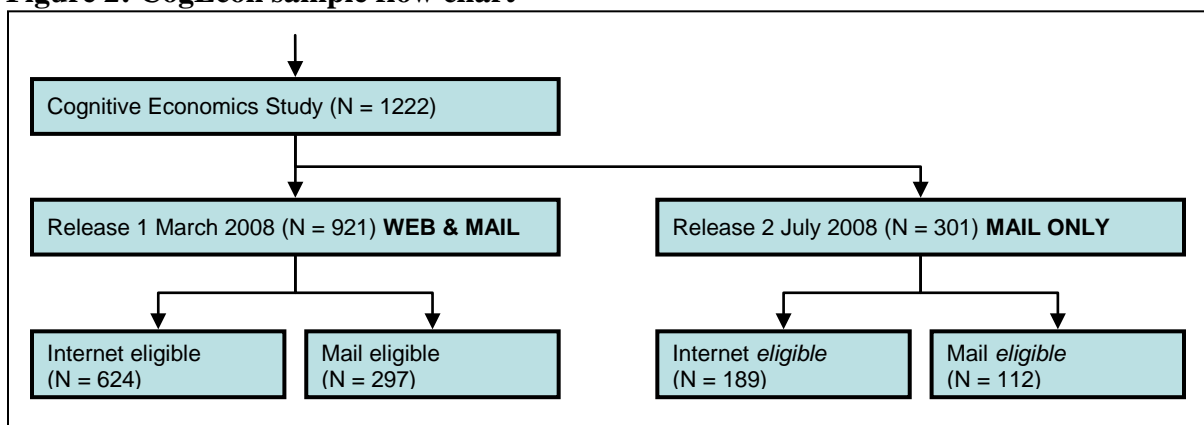
The initial invitation letter included a personalized check for \$30, which invitees could keep whether or not they completed the survey. Those invited to the web survey were given directions for how to log on and complete the survey, while people invited to take the mail version were given a copy of the questionnaire

Up to three reminder letters were sent to non-respondents over a period of several weeks. For respondents invited to the web mode, the last letter contained a questionnaire and an invitation to complete the mail questionnaire rather than the web survey. Twenty-eight members of the first (internet-using) group eventually submitted a mail questionnaire in lieu of the web survey.

Release 2: July 2008 (mail only)

This mail-only release was fielded in July 2008 and closed by early October. The random assignment to sample releases allowed the mail-only fielding of release 2 to function as a randomized experiment. The goal of this experiment is to control for and better understand mode differences that resulted during release 1.

Figure 2: CogEcon sample flow chart



C. CogEcon 2008: response rates

CogEcon 2008 achieved an overall response rate of 80.6%, with 985 responses from the 1222 people invited. This includes 959 completed surveys (78.5%) and another 26 (2.1%) partially completed surveys. The following table presents a summary of response rates, broken down by release and mode:

Table 1: CogEcon 2008 sample size and response rates: by release and mode

CogEcon 2008	All	Release 1 (web)	Release 1 (mail)	Release 2 (all mail)
Invited (eligible)	1222	624	297	301
Completed	959 (78.5%)	521 (83.5%)	212 (71.6%)	226 (75.1%)
Partial	26 (2.1%)	23 (3.7%)	0 (0%)	3 (1.0%)
No response	237 (19.4%)	80 (12.8%)	85 (28.4%)	72 (23.9%)

Twenty-eight people were invited to the web survey but returned mail questionnaires. Of these, two called and requested the mail version, while the others completed the mail questionnaire that was sent with the last reminder letter.

One of the 23 partial respondents from Release 1 was originally invited to the web version but submitted via mail. In total, there were 22 partially completed web submissions and 4 partially completed mail submissions.

In release 1, the web invitees had a higher response rate than the mail invitees. In release 2, the internet-eligible invitees had a response rate of 77.2% (146 of 189), which was slightly higher than the 74% (83 of 112) response rate for the mail-eligible invitees.

Other statistics:

- *Release 1:* The median time to complete the web survey was 53 minutes. No information is available on time burden for release 1 mail respondents.
- *Release 2:* The median time to complete the questionnaire was 60 minutes. This was self-reported in question 158, one of the questions added for release 2.

D. CogEcon 2009: two modes

Sample size

CogEcon 2009 was fielded to all individuals who completed their CogEcon 2008 questionnaire and were still eligible to participate.⁷ In total, 943 invitation letters were mailed. The list below describes how the sample was determined:

- There were 985 submissions in 2008;
- 22 web submissions were only partially complete, and these respondents were removed from the sample;
- 6 additional respondents were removed because they were deceased or had a terminal illness;
- 3 people did not submit CogEcon 2008 but were invited anyway;⁸

⁷ Respondents were considered ineligible to participate in CogEcon 2009 if they were deceased or terminally ill; cognitively or physically unable to complete a survey, no longer participating in CogUSA study; had withdrawn from the CogEcon study; or if they had a CogUSA interview scheduled too close to the CogEcon 2009 fielding date.

⁸ Two of three completed CogEcon 2009 and are in the sample of respondents in the public release data files. The third individual never had the 2009 survey released and therefore has not submitted either wave of the survey; this observation is not in the public release data but is accounted for in Table 2.

- 17 people never had their survey released because of an agreement with CogUSA—participants were not to be invited to take the CogEcon 2009 survey until it had been at least 30 days since last contact by CogUSA.

The following table summarizes how the CogEcon 2008 result was mapped into CogEcon 2009 invitations:

Table 2: CogEcon 2008 result and invitation to CogEcon 2009

<i>CogEcon 2008 result</i>	<i>Invited to CogEcon 2009?</i>		
	Yes	No	Total
Completed	941	22	963
Partial	0	22	22
No response	2	1	3
Total	943	45	988

Mode, timing and reminders

Participants were invited to take the CogEcon 2009 survey in the mode they used to complete the CogEcon 2008 survey. The 466 respondents who completed the CogEcon 2008 mail questionnaire received a CogEcon 2009 mail questionnaire. The 473 respondents who completed an internet survey were sent an invitation letter and instructions to log in to the internet version of the survey.

The bulk of the mail surveys were mailed on May 11, 2009, while the bulk of the invitation letters to the internet sample were mailed on May 15, 2009. Some letters were sent later in order to coordinate the timing with CogUSA. All potential respondents received a \$30 check with the first invitation to complete the survey.

Three reminder letters were sent to non-respondents over a period of several weeks. First reminder letters were sent after two weeks for the mail survey, and one week for the internet survey. Second reminder letters followed two weeks after the first reminder, and third letters followed two weeks thereafter. As with the original survey, the third reminder letter invited respondents to “switch modes.”

A small fraction of participants invited to CogEcon 2009 were not sent reminder letters because they were going to be contacted by CogUSA within 30 days from when the reminder letters were sent.

E. CogEcon 2009: response rates

Of the 943 participants invited to take CogEcon 2009, 847 returned a mail survey or submitted at least some responses to the web survey, for a response rate of 90.2%.⁹ Additionally, 5 of the 943 invitees were deceased and 1 had a terminal illness; 4 of the 847 submissions were only partially complete.¹⁰ Excluding deceased and terminally ill respondents, and only counting completed surveys, the adjusted overall response rate is 90.0% (843 of 937).

The variable *c2_modesubmit* gives the respondent's submission mode. The 847 submissions included:

- 410 internet surveys (4 of which were partially complete);
- 2 via telephone, during which an interviewer filled out the internet survey for the respondent;¹¹
- 434 paper-and-pencil (mail) questionnaires;
- 1 from a participant who used the web data entry instrument.¹²

The median internet respondent reported spending 35 minutes completing the survey, while the median mail respondent spent 45 minutes. The means were 37 minutes and 55 minutes, respectively.

A summary of the sample and responses is presented below in *Figure 3: Cognitive Economics Sample Flow Chart*. Note that in the flow chart only two people who did not complete CogEcon 2008 were invited to CogEcon 2009. As stated in footnote 8 on page 8, there were in fact three people who were in the sample of people to invite to CogEcon 2009, but one person was ultimately not invited due to a time conflict with CogUSA. This person has been removed from the sample and is represented among the 237 people who did not respond to CogEcon 2008.

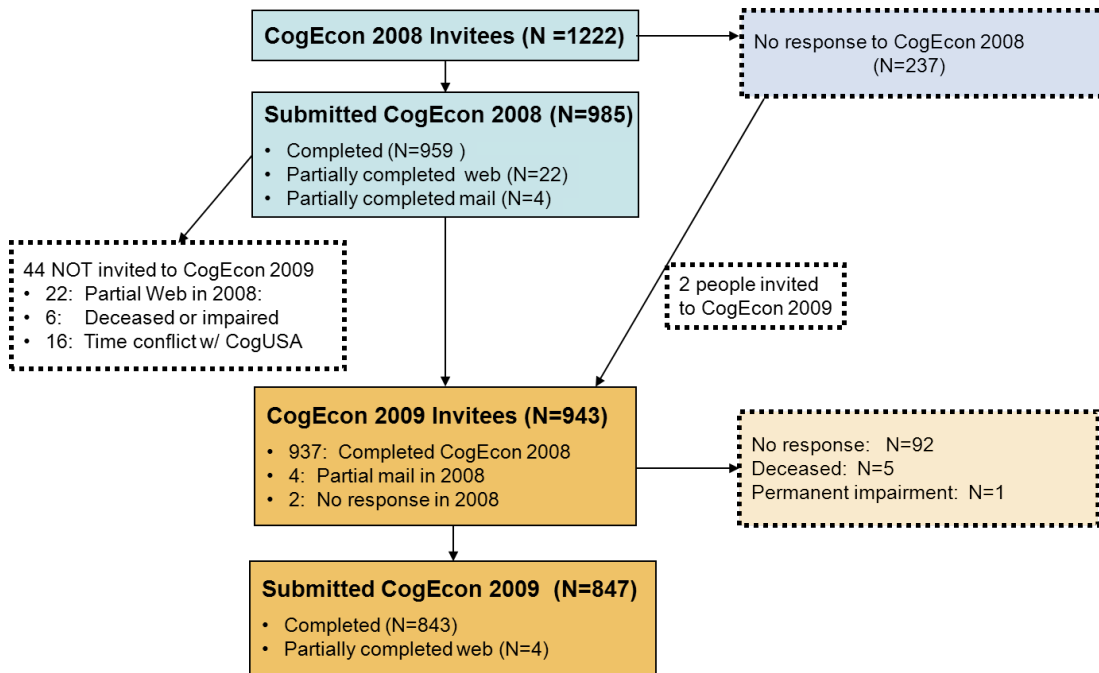
⁹ One respondent submitted both a web survey and a mail questionnaire, so there were actually 848 submissions. After analyzing the two submissions, we feel confident that the web submission is from the intended respondent, and we dropped the mail observation from the public data files. Additional details about this case can be provided upon request.

¹⁰ We also learned that two of the 17 respondents who never had the CogEcon 2009 survey released were deceased.

¹¹ The two telephone survey respondents, originally web invitees, requested to be interviewed by telephone because of impairments.

¹² The respondent was inadvertently told to go to the site that is used internally to input the mail questionnaire responses. This and the normal web instrument have slightly different wording, and this site does not have "reminder screens" when respondents skipped questions.

Figure 3: CogEcon sample flow chart



F. Sample selectivity

Hsu, Fisher, and Willis (2008) examine the correlates of internet use among the CogEcon sample. Their main finding is that reported internet use among the CogEcon respondents is correlated with various demographic factors such as age and education. This finding is similar to the pattern of internet access in the HRS data. In addition, the respondents' number series score (a measure of fluid intelligence obtained in the CogUSA in-person survey) has a strong positive relationship to internet use, implying that respondents who use the internet tend to be of considerably higher cognitive ability than those without, even after controlling for age and education. Lastly, coupled respondents have a slightly higher likelihood of using the internet. An important implication of these findings is that internet-only surveys might exclude an important subset of the population which is quite different from the respondents. For this reason, the CogEcon study continues to offer paper-and-pencil questionnaires for people without internet access.

G. Mode differences

Hsu and McFall (2011) use the mail-only fielding of CogEcon 2008 release 2 to analyze whether the mode of survey, including some design differences, impacted response rates and the answers people provided. They find that web invitees are more likely to participate in the survey and have higher item response rates than mail invitees.¹³ Based on their analysis, they conclude that pooling data from the mail and internet surveys

¹³ One important exception is for the questions asking about the value or range of income, assets or debts. For these questions the mail respondents have lower non-response, but use the range card (rather than an exact value) much more frequently.

appears legitimate and that there is no evidence that mode itself leads to significantly different usability of the data.

III. CogEcon survey development

The project team planned, drafted, and implemented CogEcon 2008 following a multi-stage process, which included focus groups and a pretest prior to final revisions. The “final” version of CogEcon 2008 was fielded in two waves (February/March and July/August 2008), to avoid conflict with CogUSA interviews.

A. Pilot testing

Several pre-tests were conducted prior to developing the final survey that was launched in February 2008.

I. Pre-test of financial sophistication measures (Summer of 2007)

During the summer of 2007 the project team fielded a preliminary paper-and-pencil version of the financial sophistication measures to retirees at the Fox Run retirement community in Novi, Michigan, and an internet survey administered to the RAND American Life Panel (ALP).

II. Focus groups (November 2007)

With the collaboration with Kirsten Alcer and Fred Conrad of the Survey Research Center, a qualitative research study using focus groups was conducted in November, 2007, to obtain additional data about the CogEcon survey. The sample included 15 adults 50 years old and above who resided in or near Ann Arbor, Michigan.

A cognitive interviewing technique was employed, in which respondents described what they were thinking as they approached and thought through their responses to each of the questions. Some focus was also given to usability and screen design on the internet survey. A summary of results from the focus groups is available upon request.

III. Mail and Internet Pilot (mid November through early December 2007)

A pretest of an early draft of the entire CogEcon 2008 survey was conducted from mid-November through early December 2007. A total of 116 respondents were asked to participate in this pretest; 65 individuals were asked to complete the survey on the internet; 51 were sent a paper-and-pencil questionnaire. We asked respondents who had been contacted for the Cognition Study pre-test to complete the CogEcon survey. Thirty-one participants completed the internet survey and 27 completed the mail questionnaire within the timeframe allotted.

B. CogEcon 2008 production survey

The CogEcon project team used the results from the pretests and focus groups to develop the finalized version of the 2008 Cognitive Economics Survey. The final version of the survey contains more detailed measures of financial literacy, asset ownership and portfolio allocation than previously available in HRS. It also includes self-rated financial

knowledge and hypothetical decision tasks related to Social Security and long term care, and measures of risk aversion directly from the HRS.

C. CogEcon 2009 Post-Crash survey

In winter and spring 2009, the Cognitive Economics research team developed and fielded a “Post-Crash” survey to respondents from CogEcon 2008. The timing of CogEcon 2008—fielded shortly before the financial crisis started in September 2008—provided an opportunity to capture the short-run effects of the financial crisis by quickly fielding another survey.

CogEcon 2009 was designed to enable comparisons between pre- and post-crash financial situations, attitudes, and financial decision-making. Survey development began in mid-March 2009. The project team reviewed three other surveys designed to measure the effects of the economic crisis—the 2008 HRS Internet Survey and two that were fielded on the RAND American Life Panel. In the end, the project team focused on comparability across CogEcon waves rather than consistency with the other post-crash studies. Many questions from CogEcon 2008 were re-asked to enable pre- and post-crash comparisons. The project team drafted many others questions from scratch, including some questions explicitly asking how the crisis affected their attitudes, saving, spending and work decisions.

CogEcon 2009 had fewer questions in order to minimize respondent burden. The survey was fielded in mid-May 2009.

References

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