



OVERVIEW

The U.S. Census Bureau collaborated with several U.S. federal statistical agencies to develop a measure of trust in official statistics and attitudes towards use of administrative records for statistical purposes.

OBJECTIVES

- Develop a measure of trust of U.S. federal statistics.
- Compare measurement error detection methods.
- Assess the relationship between measurement error and item nonresponse.

DATA COLLECTION

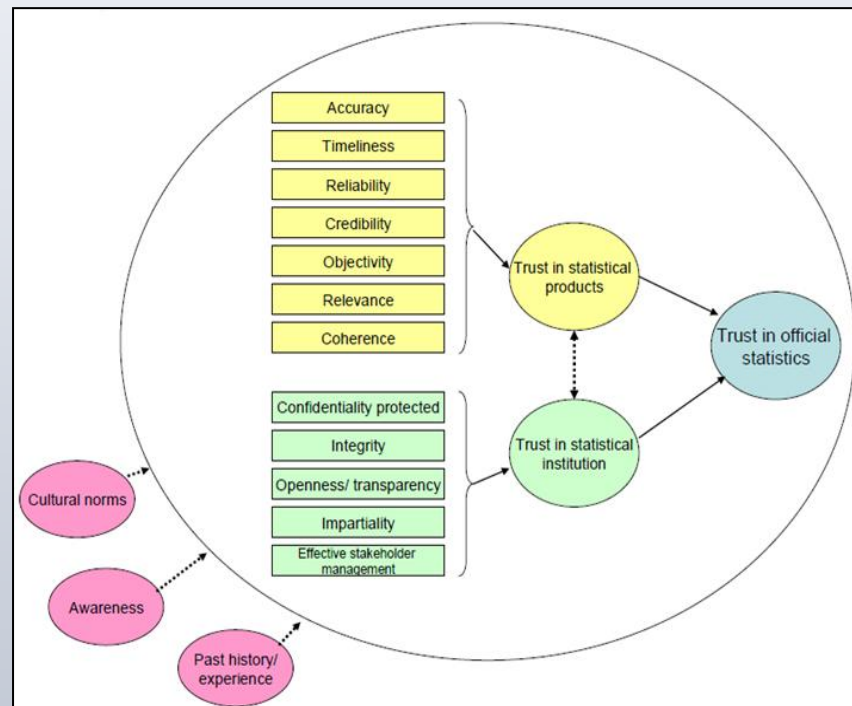
Cognitive Testing: Conducted 42 cognitive interviews with a diverse sample.

Field Testing: Used a Gallup RDD survey w/ three pretesting phases in early 2012 ($n = 1,887$).

Random Probes: Followed-up questions 10% of the time.

METHOD

During the construct and item development phase, we consulted Fellegi's model of trust of official statistics (Brackfield, 2011).



We attempted to measure trust in statistical products (TSP): accuracy, relevance, & credibility; and trust in statistical institutions (TSI): integrity, confidentiality, transparency, & impartiality; as well as awareness of federal statistics, confidence in institutions, and attitudes towards use of administrative records for statistical purposes.

We used a variety of methods to assess the performance of the individual items and the overall measure in between data collection weeks:

- Cognitive interviews (CI) and expert reviews to assess and improve items.
- Random probes (RP) to assess item performance: “What did you think the question was asking?” & “Can you tell me why you chose that response?”
- Exploratory factor analysis (EFA) to explore the factor structure of items (two items were reassigned to different factors after examination).
- Confirmatory factor analysis (CFA) to evaluate item error variance ($EV = 1 - r^2$) within factors.
- Using a combination of CI results, RP results, and EV, we identified problematic items and flagged items for removal during pretesting weeks two and three.

A Multi-Method Analysis of the Relationship between Item Refusal and Measurement Error, Using a Measure of the Public's Trust of Official Statistics in the United States

Morgan Earp¹, Jennifer Hunter Childs², Melissa Mitchell³ & Stephanie Wilson⁴

¹U.S. Bureau of Labor Statistics, ²U.S. Census Bureau, ³U.S. National Agricultural Statistics Service, & ⁴U.S. National Center for Health Statistics



RESULTS

Six items measuring trust of statistical products/institutions were recommended for removal based on results from cognitive interviews (CI), random probes (RP), and error variance (EV) after the first round of pretesting.

- At least ¼ of raters indicated that these items were problematic based on CI results.
- ½ of these items had problems identified by RP results.
- All items cut tended to have EV >.50 indicating that they accounted for less than 50% of the variation in the factor they were intended to measure.
- Some items were kept despite having similar results due to the fact that they were the only item measuring a specific component of trust.

Table One: Measurement Error Results (Week One of Pretesting)

Item Wording	CI	RP	EV	Cut
Personally, how much trust do you have in the federal statistics in the United States? Would you say that you tend to trust federal statistics or tend not to trust them?	0.00	0	0.06	
Policy makers need federal statistics to make good decisions about things like federal funding.	0.25	0	0.35	
State and local government officials need federal statistics to make good decisions.	1.00	1	0.60	x
Statistics provided by the federal agencies are generally accurate.	0.00	0	0.16	
The unemployment rate gives a true picture of what is happening to unemployment.	0.50	1	0.61	x
Statistics provided by federal agencies are often biased.	0.25	0	0.13	
Elected officials interfere with the production of statistics by federal agencies.	0.75	1	0.34	
Federal statistics are made public only if approved by the president or congress.	0.25	1	0.69	x
People can trust federal statistical agencies to keep information about them confidential.	0.00	0	0.31	
Federal statistical agencies give personal information about people to the IRS.	0.25	0	0.60	x
Federal statistical agencies give personal information about people to marketing firms.	0.50	0	0.46	x
People can easily find out exactly how federal statistics are produced.	0.25	1	0.67	
Federal statistical agencies are honest.	0.75	0	0.11	
Federal statistical agencies have the experts they need to produce high quality statistics. (Federal statistical agencies are a reliable source for high quality statistics.)	0.50	1	0.35	
Private companies could produce more accurate statistics than Federal statistical agencies.	0.25	0	0.55	x

We also explored the relationship between our indicators of measurement error, item refusals (REF), and don't know/undecided rates (DK/UND) during pretesting (PT) and during actual data collection (ACT).

Table Two: Measurement Error Correlations (Week One of Pretesting)

	CI	RP	EV	REF	DK/UND	CUT
CI	1.00	0.50	0.22	-0.16	0.04	0.26
RP	0.50	1.00	0.56	-0.12	0.08	0.17
EV	0.22	0.56	1.00	-0.40	0.28	0.72
REF	-0.16	-0.12	-0.40	1.00	0.25	-0.62
DK/UND	0.04	0.08	0.28	0.25	1.00	0.14
CUT	0.26	0.17	0.72	-0.62	0.14	1.00

weak $r = \pm .10$ to .29
 moderate $r = \pm .30$ to .49
 strong $r = \pm .50$ to 1.00
 (Cohen, 1988)

Table Three: Measurement Error Correlations (Pretesting & Actual Data Collection)

	CI	RP	PT EV	PT REF	PT DK/UND	ACT REF	ACT DK/UND
ACT EV		0.09	0.71	0.66	0.13	0.38	0.50
ACT REF		-0.12	-0.12	0.00	-0.20	-0.43	-0.34
ACT DK/UND		0.63	0.69	0.58	0.29	0.97	1.00

SUMMARY OF RESULTS

- CI results were strongly correlated w/ RP results & DK/UNDC rates.
- RP results were strongly correlated w/ CI results, EV, & DK/UNDC rates.
- EV were strongly correlated w/ RP & DK/UNDC rates, and moderately negatively correlated w/ REF.
- PT DK/UNDC rates were strongly correlated w/ ACT DK/UNDC rates.
- EV is also indicative of measurement error and potential nonresponse bias.

CONCLUSIONS

RP, EV, & REF, were more indicative of problems in the actual survey than CIs were. Though CIs influenced our decision to cut questions, it is possible that this could have been done using the other methods if necessary.