Item Nonresponse on the Faculty Survey of Student Engagement

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Abstract

Survey researchers often wonder about the impact of missing data and whether the sample is representative of a larger population. This study focuses on investigating the prevalence of item nonresponse bias among participants in the FSSE survey and its impact on the estimates of ten FSSE scale scores, by comparing item nonresponse patterns across faculty-level characteristics such as gender identity, racial or ethnic identification, citizenship, employment status, academic rank, and the number of undergraduate or graduate courses taught. These analyses examined a set of FSSE items that comprise ten FSSE scales.

Background & Purpose

Surveys are a widespread tool in the assessment of educational quality. However, the quality and usefulness of the survey data depends on the validity of the responses respondents give on each survey question. In survey research, missing data occurs for many reasons and may come from a variety of sources such as nonconverage, total or unit response, item non response and partial response (Brick & Kalton, 1996). Because the sources of missing data may result in a non-representative sample of a larger population, the results or the inferences made based on the sample might be inaccurate. Because most surveys are self-reported and have some level of item nonresponse, this might in turn bias the estimates that represent particular educational outcomes. While assessing the quality of survey data, the major concern is the extent to which respondents provide high-quality data by providing accurate and complete responses to all survey items (Schaeffer & Presser, 2003) and whether the item nonresponse patterns have an impact on the outcome measures or depend on certain characteristics of respondents.

Although there are no agreed-upon criteria to determine nonresponse, there is a general consensus that respondent behavior should not vary depending on group membership. For example, in a survey of faculty, the occurrence of nonresponse items should not relate to factors such as gender, rank, discipline, or other group membership. The Faculty Survey of Student Engagement (FSSE) is a survey which annually collects information about student engagement both in and out of the classroom at hundreds of baccalaureate degree-granting colleges and universities. Although faculty members tend to respond to surveys at higher rates than students, nonresponse patterns may still exist across different groups. This might result in higher or lower scores on FSSE measures for certain groups, which may reflect either the actual performance of faculty or the biased estimates of performance due to nonresponse bias.

The purpose of this study was to investigate the prevalence of item nonresponse bias among participants in the FSSE survey and its impact on the estimates of ten FSSE scale scores, by comparing item nonresponse patterns across faculty-level characteristics such as gender identity, racial or ethnic identification, citizenship, employment status, academic rank, and the number of undergraduate or graduate courses taught.

Data

The data used for this study come from the 2014 administration of the Faculty Survey of Student Engagement (FSSE). FSSE annually collects data from faculty members at baccalaureate degree-granting colleges and universities. FSSE was designed to complement the National Survey of Student Engagement by measuring faculty perceptions and expectations of undergraduate engagement in educationally purposeful activities, the extent to which faculty promote learning and development in their courses, the extent of faculty interaction with students, and how faculty allocate their time. Results from FSSE provide institutions with an assessment of faculty attitudes and behaviors related to educational practices known to produce positive educational outcomes for students. In addition, survey results provide insight into how faculty members perceive their institution, divide up their work time, and spend class time. The 2014 FSSE administration resulted in 18,860 faculty respondents from 143 institutions.

Sample

The sample for this study consists of responses from approximately 18,860 faculty members at 143 institutions that participated in the FSSE survey. To be included in this study, faculty had to have provided their demographic information at the end of the FSSE survey. Forty-seven percent of the faculty members in this study identify as women, 72% identify as White with most, 97%, identifying as citizens of the United States. Twenty-seven percent are full Professors and 81% are full-time faculty. On average, the faculty in this sample taught four undergraduate courses and one graduate-level course.

Measures

The item nonresponse was examined among fifty survey items on the FSSE 2014 survey. These fifty items were selected because they are included in ten FSSE scales, the main measures of faculty involvement in student engagement on the FSSE survey. These scales are Higher-Order Learning, Reflective & Integrative Learning, Learning Strategies, Quantitative Reasoning, Collaborative Learning, Discussions with Diverse Others, Student-Faculty Interaction, Effective Teaching Practices, Quality of Interactions, and Supportive Environment. For more information about these scales see Table 1

Table 1 Select FSSE Items

Scale	Item	Description
Supportive Environment		How important is it to you that your institution **increase** its emphasis on each of the following: *Response Options: Very important, Important, Somewhat important, Not important*
	fSEacademic	Providing support to help students succeed academically
	fSElearnsup	Students using learning support services (tutoring services, writing center, etc.)
	fSEdiverse	Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.)
	fSEsocial	Providing opportunities for students to be involved socially
	fSEwellness	Providing support for students' overall well-being (recreation, health care, counseling, etc.)
	fSEnonacad	Helping students manage their non-academic responsibilities (work, family, etc.)
	fSEactivities	Students attending campus activities and events (performing arts, athletic events, etc.)
	fSEevents	Students attending events that address important social, economic, or political issues
Quality of Interactions		Indicate your perception of the quality of student interactions with the following people at your institution: *Response options: 1=Poor to 7=Excellent*
	fQIstudent	Other students
	fQIadvisor	Academic advisors
	fQIfaculty	Faculty
	fQIstaff	Student services staff (career services, student activities, housing, etc.)
	fQIadmin	Other administrative staff and offices (registrar, financial aid, etc.)
Student-Faculty Interaction		During the current school year, about how often have you done each of the following with the undergraduate students you teach or advise: *Response options: Very much, Quite a bit, Some, Very little*
	fSFcareer	Talked about their career plans
	fSFotherwork	Worked on activities other than coursework (committees, student groups, etc.)
	fSFdiscuss	Discussed course topics, ideas, or concepts outside of class
	fSFperform	Discussed their academic performance
Effective Teaching Practices		In your undergraduate courses, to what extent do you do the following? *Response options: Very much, Quite a bit, Some, Very little*
	fETgoals	Clearly explain course goals and requirements
	fETorganize	Teach course sessions in an organized way
	fETexample	Use examples or illustrations to explain difficult points
	fETvariety	Use a variety of teaching techniques
	fETreview	Review and summarize material for students
	fETstandards	Provide standards for satisfactory completion of assignments
	fETdraftfb	Provide feedback to students on drafts or works in progress
	fETfeedback	Provide prompt and detailed feedback on tests or completed assignments
Quantitative Reasoning		In your selected course section, how important is it to you that the typical student do the following: *Response options: Very important, Important, Somewhat important, Not important*
	fQRconclude	Reach conclusions based on his or her own analysis of numerical information (numbers, graphs, statistics, etc.)
	fQRproblem	Use numerical information to examine a real-world problem or issue (unemployment, climate change, public health, etc.)
	fQRevaluate	Evaluate what others have concluded from numerical information
Reflective & Integrative Learning		In your selected course section, how important is it to you that the typical student do the following: *Response options: Very important, Important, Somewhat important, Not important*
	fRIintegrate	Combine ideas from different courses when completing assignments
	fRIsocietal	Connect his or her learning to societal problems or issues
	fRIdiverse	Include diverse perspectives (political, religious, racial/ethnic, gender, etc.) in course discussions or assignments
	fRIownview	Examine the strengths and weaknesses of his or her own views on a topic or issue
	fRIperspect	Try to better understand someone else's views by imagining how an issue looks from his or her perspective
	fRInewview	Learn something that changes the way he or she understands an issue or concept
	fRIconnect	Connect ideas from your course to his or her prior experiences and knowledge
Collaborative Learning		In your selected course section, how much do you encourage students to do the following: *Response options: Very much, Quite a bit, Some, Very little*
	fCLaskhelp	Ask other students for help understanding course material
	fCLexplain	Explain course material to other students
	fCLstudy	Prepare for exams by discussing or working through course material with other students
	fCLproject	Work with other students on course projects or assignments
Learning Strategies		In your selected course section, how much do you encourage students to do the following: *Response options: Very much, Quite a bit, Some, Very little*
	fLSreading	Identify key information from reading assignments
	fLSnotes	Review notes after class
	fLSsummary	Summarize what has been learned from class or from course materials
Discussions with Diverse Others		In your selected course section, how much opportunity do students have to engage in discussions with people from the following groups: *Response options: Very much, Quite a bit, Some, Very little*
	fDDrace	People of a race or ethnicity other than their own
	fDDeconomic	People from an economic background other than their own
	fDDreligion	People with religious beliefs other than their own
	fDDpolitical	People with political views other than their own
Higher-Order Learning		In your selected course section, how much does the coursework emphasize the following: *Response options: Very much, Quite a bit, Some, Very little*
	fHOapply	Applying facts, theories, or methods to practical problems or new situations
	fHOanalyze	Analyzing an idea, experience, or line of reasoning in depth by examining its parts
	fHOevaluate	Evaluating a point of view, decision, or information source
	fHOform	Forming a new idea or understanding from various pieces of information

Analyses

To answer the first research question about whether or not item nonresponse depends on faculty-level characteristics, item responses to fifty survey items were dichotomously recoded to indicate whether or not the item was responded to or missing. Next, chi-square tests of independence were used to examine whether the item nonresponse for each item differed by the faculty characteristics gender identity, racial or ethnic identification, citizenship, employment status, academic rank, and the number of undergraduate or graduate courses taught. Significance was noted for $p < .001$ due to the large sample size. Additionally, descriptives of individual items were examined to ensure that responses were well distributed and that there was no evidence that items were difficult to answer (such as unusually high item nonresponse). To answer the second research question about the magnitude of the item nonresponse for different groups, the effect size for the chi-square test of independence was calculated using the phi coefficient

$(\phi = \sqrt{\frac{\chi^2}{N}}$ for 2×2 table or Cramer's V coefficient $(V = \sqrt{\frac{\chi^2}{N(L-1)}}$, where L refers to the smaller number, row or column, in the contingency table) for a contingency table larger than 2×2, to describe the magnitude of association between the dichotomous or categorical variables. The range of phi or Cramer's V coefficient is between 0 and 1, which corresponds to the complete independence to complete dependence of the variables. To measure the effect size of a chi-square test of independence, Cohen (1988) has suggested that phi values .10, .30 and .50 correspond to small, medium and large effects, respectively. To interpret the magnitude for Cramer's V, a Cramer's V value needs to be converted to w, which is equivalent to a phi coefficient and is done by multiplying its value by $\sqrt{(L-1)}$. For example, a Cramer's V value of .10 obtained from a 2×4 table is equivalent to a phi or w value of .10 and so the effect is small.

Research Questions & Results

Does item nonresponse vary by faculty characteristics?

As shown in Table 2, the items within each scale do not have high proportions of item nonresponse. The highest proportion of item nonresponse (i.e., 14-15%) was found in the Discussions with Diverse Others scale and the lowest proportion of item nonresponse (i.e., 2-3%) was in the Supportive Environment scale. Overall, the item nonresponse rate for items within FSSE scales is between 2 to 15%. Using chi-square tests of independence to examine the item nonresponse by faculty characteristics, we find that most of the item nonresponse does not vary by faculty characteristics.

If item nonresponse differences exist, what is the magnitude of the difference?

As shown in Table 2, there were some significant differences found for item nonresponse by faculty characteristics, but the effect size (i.e., the magnitude of the relationship) was very small (less than .1). For example, there are significant differences in item nonresponse by gender and the number of undergraduate courses being taught among items in the Discussions with Diverse Others scale, but the magnitude of the differences are less than or equal to .05.

Table 2 Item Nonresponse and Statistical and Practical Differences by Groups Among Select FSSE Items

Scale	Item	Item Nonresponse N	Item Nonresponse %	Gender	Employment Status	Academic Rank	Race/ Ethnicity	Citizenship	Number of Undergrad. Courses	Number of Graduate Courses
Supportive Environment	fSEacademic	513	3							
	fSElearnsup	456	2							
	fSEdiverse	385	2							
	fSEsocial	389	2							
	fSEwellness	424	2							
	fSEnonacad	425	2							
	fSEactivities	560	3							
	fSEevents	561	3							
Quality of Interactions	fQIstudent	545	3							
	fQIadvisor	730	4	$\phi=.039*$	$V=.038*$					
	fQIfaculty	664	4							
	fQIstaff	1244	7						$V=.048*$	
	fQIadmin	1104	6				$\phi=.039*$		$V=.046*$	
Student-Faculty Interaction	fSFcareer	976	6	$\phi=.030*$						
	fSFotherwork	1113	6	$\phi=.035*$						
	fSFdiscuss	1032	6	$\phi=.041*$						
	fSFperform	1089	6							
Effective Teaching Practices	fETgoals	986	6							
	fETorganize	1091	6							
	fETexample	1115	6							
	fETvariety	1021	6							
	fETreview	1035	6							
	fETstandards	1045	6							
	fETdraftfb	1115	6							
	fETfeedback	1195	7							
Quantitative Reasoning	fQRconclude	1973	11	$\phi=.035*$						
	fQRproblem	2044	12							
	fQRevaluate	2108	11	$\phi=.031*$						
Reflective & Integrative Learning	fRIintegrate	1997	11							
	fRIsocietal	2124	12							
	fRIdiverse	2096	12				$V=.049*$			
	fRIownview	2121	12				$V=.039*$			
	fRIperspect	2160	12							
	fRInewview	2131	12				$V=.039*$			
	fRIconnect	2155	12				$V=.053*$			
Collaborative Learning	fCLaskhelp	2202	13						$V=.048*$	
	fCLexplain	2336	13							
	fCLstudy	2342	13							
	fCLproject	2315	13						$V=.048*$	
Learning Strategies	fLSreading	2322	13				$V=.043*$			
	fLSnotes	2397	14	$\phi=.029*$					$V=.063*$	
	fLSsummary	2378	14						$V=.049*$	
Discussions with Diverse Others	fDDrace	2448	14				$V=.045*$		$V=.048*$	
	fDDeconomic	2563	15	$V=.039*$			$V=.045*$		$V=.045*$	
	fDDreligion	2665	15				$V=.041*$		$V=.050*$	
	fDDpolitical	2710	15	$V=.037*$			$V=.043*$		$V=.051*$	
Higher-Order Learning	fHOapply	2369	14	$\phi=.031*$						
	fHOanalyze	2360	13							
	fHOevaluate	2392	14				$V=.041*$			
	fHOform	2462	14							

Note: *$p < .001$. For dichotomous variables, employment status and citizenship, values are computed using Continuity Correction (2*2 table) instead of a Chi-Square test.

Discussion & Significance

Although the item nonresponse for items within the Discussions with Divers Others scale is not extremely high, it is higher than the items in other scales. This may be an indication that these items are more difficult to answer than other survey items or it may be that these items are towards the end of the survey and respondents are dropping off. Cognitive interviews or additional testing could help with understanding why these items have more missing responses. One limitation of this study is that it did not account for when participants stop responding to the survey. It is possible that patterns of bias could emerge after respondents that did not finish the survey are removed from the analysis. Additionally, this study does not account for response bias. It is unknown whether or not there exists bias in who responds to the FSSE in general. Although some statistically significant differences in item nonresponse were found for some of the tested items, the magnitude of these differences was trivial. Institutions and researchers using these items can feel confident that item nonresponse does not bias the results of these items. Future faculty characteristics, such as faculty's disciplinary appointment, age, and earned doctorate, could additionally be examined to further strengthen these results.

Conclusion

There are no notable item nonresponse bias indications among the items in the ten FSSE scales. The proportion of missing responses to these items does not vary by the faculty characteristics gender identity, racial or ethnic identification, citizenship, employment status, academic rank, and the number of undergraduate or graduate courses taught. Institutions and researchers using these items can feel confident that item nonresponse does not bias their results.