Demystifying Nonresponse Error in Student Survey

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Survey research is probably the most popular research method in the field of student affairs. From well-known national surveys like the National Survey of Student Engagement (NSSE) and the Cooperative Institutional Research Program (CIRP) to house-baked surveys on student satisfaction and program evaluations, survey research plays a crucial role in student affairs practice. Although a survey is a convenient tool in assessing student and faculty opinions and attitudes, there are some basic requirements needed to be met in order to yield valid survey results. For instance, a survey instrument must be tested for validity and reliability and the sample must be randomly selected. If these basic requirements are not met, the results will be unreliable and cannot be generalized to the population. What is more, there are other types of errors that can happen in the process of surveying that can invalidate the results. The one we are going to address today is *nonresponse error*.

What is Nonresponse Error?

Dillman (2000) pointed out four types of errors that can totally overthrow survey results: *sampling error, coverage error, measurement error*, and *nonresponse error*. Sampling error and coverage error usually happens when the sample size is too small or when the researchers neglect certain sections of the population when drawing the sample. Measurement error happens when the survey instrument is poorly worded. Of the four types of errors, *nonresponse error* is the most mysterious one and it is also the most difficult to deal with. Nonresponse error happens when the results of people who responded to the survey are different from sampled individuals who did not respond. For example, a student satisfaction survey was administered to a college campus which had a student population of 50% Caucasians and 50% African Americans. When the survey data were collected, more than 90% of the Caucasian students had responded to the survey compared to only 5% of the African American students who responded. The 10% Caucasian students and the 95% African American students who did not respond to the survey are the so-called *nonrespondents*. It is a reasonable presumption that if the rest of the 95% African American students had responded to the survey, the results would be very different. Thus, the nonresponse error may have occurred in the study.

Nonresponse error is sometimes known as *nonresponse bias* or *nonresponse effect*. Although these terms can have different meanings in some contexts, they are basically referring to the same error which occurs when the individuals responding to a survey differ from nonrespondents on variables relevant to the survey topic (Rogelberg & Luong, 1998). Note that just because there are nonrespondents does not mean there must be nonresponse error. Nonresponse error exists only when respondents and nonrespondents differ substantively on variables relevant to the survey. Also note that nonresponse error is not necessarily bound with response rate. A survey can have a very low response rate but no nonresponse error if the sample responded the same as the nonrespondents. On the other hand, nonresponse error can happen even if response rates are as high as 90%.

The Causes of Nonresponse

There is no lack of literature on nonresponse error (Fuller, 1974; Daniel, Schott, Atkins, & Davis, 1982; Light, Singer, & Willett, 1990; Rogelberg & Luong, 1998; Schwartz, Groves, & Schuman, 1998). Research suggests that there are four major causes of nonresponse: *inaccessibility, inability, carelessness*, and *noncompliance* (Sosdian & Sharp, 1980). Below I will explain each cause and how to properly handle each cause of nonresponse.

Inaccessibility

Inaccessibility happens when the individual never receives the survey, such as when an email survey is blocked by an Internet firewall program or junk mail, or so-called spam, filtering software. Rogelberg and Luong (1998) pointed out that inaccessibility is one of the most frequent causes of nonresponse. E-mail has become the major communication channel at most college campuses and many of today's student surveys were dispatched through the e-mail. What many student affairs practitioners do not know is that the bulk amount of survey email can trigger the spam filter at the university email system, and consequently some students may never receive the survey. What is worse is that the researcher may never be aware of the problem because the spam filtering system can discard emails without any warning message. This problem can be easily avoided by contacting the information technology (IT) department on your campus before sending out the survey. The IT department may also provide you with other useful tips in sending out your survey emails.

Inability

Inability means the individual cannot respond as in the case of illness or computer crash. Although illness and computer crashes are not under the researcher's control, the researcher should ensure that the web survey is accessible from various operation systems (Microsoft Windows, Mac, Linux…etc.) and web browsers (Microsoft Internet Explorer, Firefox…etc).

Carelessness

Carelessness occurs when an individual unintentionally disregards the survey. For example, an individual may have received the email survey, but deleted it unintentionally. Several strategies can be employed to reduce the possibility of students unintentionally disregarding the survey. First, the researcher should make students aware that the survey is coming. This can be done in several ways like posting a news article in the student newspaper or putting up flyers around the campus. If students are aware that the survey will be coming and they know the institution is going to take the results seriously, they are more likely to respond to the survey (Salant & Dillman, 1994). Second, researchers should avoid bad timing for administering the survey. For example, from our experience in conducting NSSE we learned that most students respond to the survey within two days of receiving the survey. If the students do not respond to the survey within two days, the possibility of getting a response drops quickly. Knowing this, researchers should avoid timing like mid-term exam week or a long weekend because students are less likely to respond to the survey during these occasions.

Noncompliance

Noncompliance happens when an individual has made a conscious decision not to respond to the survey. Although inaccessibility and carelessness are the most frequent explanations for nonresponse, noncompliance usually causes the biggest problem for survey researchers and is a major source of nonresponse error (Rogelberg & Luong, 1998). As previously mentioned, students generally are more likely to respond to a survey if they know the results will be taken seriously.

How to Detect Nonresponse Error

Theoretically speaking, the optimum way of identifying nonresponse error would be comparing the estimates from the respondents to the true population values. In reality, however, population values are often not available (Bose, 2001). Therefore, several alternative methods were developed to help researchers investigate the existence of nonresponse error. Dooley and Lindner (2003) suggested four methods of diagnosing nonresponse error. These four methods are (a) comparison of early to late respondents, (b) using "days to respond" as a regression variable, (c) comparing respondents to nonrespondents, and (d) comparing respondents on characteristics known a priori.

The first method of detecting nonresponse bias is to compare the results of early and late respondents. This method is based on the assumption that late respondents are more likely to respond in a similar fashion of the nonrespondents rather than early respondents (Bose, 2001). If differences were found between early and late respondents, it is inferred that nonresponse error may exist. The second method provided by Dooley and Lindner (2003) is using "days to respond" as an independent variable in regression equations in which primary variables of interest are regressed on the variable "days to respond." If the regression model yields significant results, it may indicate the existence of nonresponse error. The third method of diagnosing nonresponse error is collecting extra data from nonrespondents and comparing their responses to previous respondents. The last method compares respondents to the population on characteristics known a priori to describe the similarities and differences between respondents and the target population.

Of the four methods, comparing respondents on characteristics known a priori is the easiest to administer. If student data, e.g., sex, age, race, are available for both respondents and nonrespondents, the researchers can design a weighting scheme to accommodate the underrepresentation of particular sub-populations. This method, however, has its limitations because there are other student characteristics that could affect the survey results but are not easily detected (Goor & Stuiver, 1998).

Comparing respondents to nonrespondents is usually regarded as the best strategy of investigating nonresponse error. In operation, however, it usually involves calling back nonrespondents which costs extra money and time. Compromises between these two methods are found by comparing characteristics of early respondents with late respondents and using "days of respond" as a regression variable. These two methods are based on the assumption that late respondents share similar characteristics to the nonrespondents. If differences are found between early and late respondents, the researcher should assume the possible existence of nonresponse error (Israel, 1992).

How to Handle Nonresponse Error

There are several ways of handling nonresponse error: (a) discard the data, (b) generalize to the respondents only, and (c) generalize to the population but give caution for the possible influence of nonresponse error. In practice, as pointed out by Israel (1992), few researchers have ever thrown data away. Instead, the data are used to the best extent possible. If the researcher wants to avoid erroneous inferences about the population, he or she should generalize the results to the respondents only. In most situations, however, the researcher is expected to generalize the results to the wider population. If this is the case, the researcher should advise the audience of the possible existence of nonresponse error and that the results should be interpreted with caution.

Conclusion

Nonresponse error can be a threat to the validity of student survey results if not handled carefully. This article provides information on what may cause nonresponse, how to detect nonresponse error, and how to handle nonresponse error. Hopefully, this knowledge can help student affairs practitioners become better equipped in serving their students.

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