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Chapter V

The Problem of Common Method Variance in IS Research

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ABSTRACT

Many IS researchers obtain data through the use of self-reports. However, self-reports have inherent problems and limitations, most notably the problem of common method variance. Common method variance can cause researchers to find a significant effect, when in fact, the true effect is due to the method employed. In this chapter, we examined published research in leading information systems (IS) journals to determine if common method variance is a potential problem in IS research and how IS researchers have attempted to overcome problems with method bias. We analyzed 116 research articles that used a survey approach as the predominant method in MIS Quarterly, Information Systems Research, *and* Journal of Management Information Systems. *The results indicate that only a minority of IS researchers have reported on common method variance. We recommend that IS researchers undertake techniques to minimize the effects of common method variance, including using multiple types of respondents, longitudinal designs, and confirmatory factor analysis that explicitly models method effects.*

INTRODUCTION

Although non-positivist approaches have recently emerged as valid alternatives to traditional statistical techniques, many information systems (IS) researchers continue to rely heavily on self-reports to gather data. However, IS researchers must recognize the inherent problems associated with self-reports to assure that the results reported are due to the predicted effect and not due to common method variance. Common method variance comprises one part of the measured variance. Spector (1994) divided measured variance into three distinct components: trait variance, method variance, and error variance. Trait variance includes all of the variance associated with the variable being studied, while (common) method variance includes the variance associated with all systematic influences on the construct of interest, particularly as it relates to a common method used to gather data. Error variance is simply random measurement error, something that researchers must attempt to control in order to move closer to measuring true latent variance.

When self-reports are used, common method variance can be a serious problem and can, in fact, cause the researcher to find a significant effect when the only real effect is due to the method employed. Organ and Ryan (1995) note that a significant problem with self-reports may be unstable correlations, particularly with data measured at one point in time. Spector (1994) agrees, noting that self-reports are particularly unreliable when measuring variables that are correlated with one another. Moreover, moderators that are specific to the situation or temporary in nature may affect the accuracy of the results. These problems are particularly relevant to IS studies, which often use self-reports to gather data on system usage. Studies have shown that new models are needed to more accurately assess how people respond to frequency questions (Blair & Burton, 1987) and that IS researchers themselves do not generally agree how system usage should be measured (Straub, Limayem, & Karahanna-Evaristo, 1995). How should IS researchers test for common method variance? How can IS researchers attempt to minimize the potential bias associated with the method employed? The following section describes how the IS research community has examined the problem of common method variance and how other research communities have addressed the same issue. Further, the section provides an elementary overview of procedures that can minimize the common variance associated with the method employed. Then we move to the study methodology and results, followed by concluding remarks.

THEORETICAL BACKGROUND

Although a substantial number of IS research studies use self-reports to measure latent variance, few test for common method variance. Researchers from various disciplines have suggested multiple techniques to overcome bias associated with employing a common method—e.g., self-reports. First and foremost, IS researchers should use instruments that exhibit both reliability and validity, as per Boudreau, Gefen, and Straub (2001), Hufnagel and Conca (1994), and Straub et al. (1995). Certainly, researchers should also maximize response rates to include as many different respondents as possible and should minimize missing data within the sample (Roth & Campion, 1996). Obviously, a scale that is fraught with unreliable items, poor validity, and the like will probably yield