MAIL AND WEB SURVEYS: A COMPARISON OF DEMOGRAPHIC CHARACTERISTICS AND RESPONSE QUALITY WHEN RESPONDENTS SELF-SELECT THE SURVEY ADMINISTRATION MODE

by

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MAIL AND WEB SURVEYS: A COMPARISON OF DEMOGRAPHIC CHARACTERISTICS AND RESPONSE QUALITY WHEN RESPONDENTS SELF-SELECT THE SURVEY ADMINISTRATION MODE

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The purpose of this study was to use a nonexperimental, quantitative design to compare mail and web surveys with survey mode self-selection at two data collection waves. Research questions examined differences and predictabilities among demographics (gender, ethnicity, age, and professional employment) and response quality (pronoun use, item nonresponse, response extremity, yea-saying, item completion errors, response length, response equivalency, anecdotal comments, and multiple response use) by survey mode and response wave. Analyses were conducted using chi-squares, ANOVAs, *t*-tests, and binary logistic regressions.

A questionnaire in mail and web formats containing 48 forced-choice and open-ended items was administered to a nonrandom sample of Illinois public school guidance counselors (n = 2,880). After four reminders, the adjusted response rate was 30.56% (n = 880); 64.32% (n = 566) by mail and 35.68% (n = 314) by web; 77.73% (n = 684) during wave one and 22.27% (n = 196) during wave two. Respondents were 75% female, 86% White with a mean age of 48 years and a mean of 19 years of professional employment.

Results revealed that mail respondents were older and had more years of professional employment than web respondents, item nonresponse was greater in web than in mail surveys, and response length was greater in web than in mail surveys at wave one. Age, response length, gender, and yea-saying had significant partial effects in predicting the mail survey mode. Regarding response wave, demographics and response quality variables were neither different nor predictive.

Findings suggest that researchers need to consider the potential effects of demographic distributions in the target population when designing mail and web surveys. Mail and web surveys must also be carefully constructed to overcome potential response quality differences while maximizing the advantages of each. The low overall adjusted response rate and nonrandomized design limit generalizability to the larger group of all school counselors in the population. This study, however, provides practical and timely insight regarding the use of mail and web surveys with mode self-selection among those who responded, and offers much potential for future research.

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CHAPTER I

INTRODUCTION

Chapter 1 presents an introduction to the current study and is arranged into seven sections. The first section presents a statement of the problem. The second section provides background information regarding the context of the study. The third section presents the research questions to be analyzed. The fourth section presents information regarding the significance of the research. The fifth section addresses delimitations of the study. The sixth section presents key terms and definitions used throughout this document. The last section provides an overview of this document's contents.

Statement of the Problem

Survey research contributes a plethora of data to advance American education (Ary, Jacobs, & Razavieh, 2002)[1], stimulating changes in practice, policy, and funding and enhancing our understanding of those working in and being served by our nation's educational system (Borkan, 2006). Mail surveys are a popular means to gather survey research data; however, as technology, computers and the Internet improve, mail surveys are increasingly being used in conjunction with (or even replaced by) web surveys (Dillman, 2000; Kiesler & Sproull, 1986; Schonlau, Fricker, & Elliot, 2002). Mail and web surveys have many similarities. They can be designed to look similar, contain identical items, and gather the same information (Dillman, 2000). Both are also visual, self-administered, can be completed at a respondent's leisure, and involve reading items and writing responses (Dillman, 2000). Thus, users of both modes may believe that they are compatible and that data from the two modes can be aggregated. Research shows,

[1] All references in this dissertation follow APA style as expressed in the *American Educational Research Journal*.

however, that there are important differences between mail and web surveys that may influence the populations represented and the quality of data obtained, suggesting that the two modes may not be equivalent (Kiesler & Sproull, 1986). Thus, studies examining data quality in mail and web mixed-mode designs are needed (Dillman, 2000; Dillman et al., 2001; Dillman & Tarnai, 1988; Schonlau et al., 2002).

Having multiple data collection waves is also a commonality in survey research; however, it is not studied often and results are conflicting (Sobal & Ferentz, 1989). While some studies observe few or no differences between early and late responders (Bostick, Pirie, Luepker, & Kofron, 1992; Fraze, 1986; Gillispie, 1997; Goudy, 1976; Irani, Gregg, & Telg, 2004; Sobal & Ferentz, 1989), others have reported differences in demographics (Dallosso et al., 2003) and response quality (Bostick et al., 1992).

True experimental survey research designs are not always possible or practical in a real-world educational setting (Fraenkel & Wallen, 2006). Constraints such as time, money, resources, and survey users' skills may limit the use of experimental designs. Additionally, such designs are not always appropriate when the study's purpose is exploratory, providing important and timely data for local use, rather than making inferences and generalizations to populations (Fraenkel & Wallen, 2006). Exploratory survey research studies with nonexperimental designs are common (e.g., Kittleson, 1995; Paolo, Bonaminio, Gibson, Partridge, & Kallail, 2000; Schaefer & Dillman, 1998; Schleyer & Forrest, 2000; Schuldt & Totten, 1994; Tse et al., 1995; Walsh, Kiesler, Sproull, & Hesse, 1992; Witte, Amoroso, & Howard, 2000; Zhang, 2000), as are studies in which respondents self-select the survey administration mode (Dillman, West, & Clark, 1994; Shih & Fan, 2007b; Parker, 1992; Walsh et al., 1992). Given that data from

these studies are used to make important local decisions, it is crucial that researchers have a better understanding of how surveys behave in these circumstances (Dillman, 2000).

Despite the surge of studies involving Internet surveys in the last decade, Internet survey research is still in its infancy, with "very little decisive empirical evidence from which to draw definitive conclusions about the optimal design and employment of Internet surveys" (Schonlau et al., 2002, p. 74). They also argue, "little is known about the effects of web survey instrument design on how survey participants respond to a particular survey question…or what sort of design enhances…information accuracy" (Schonlau et al., 2002, p. 79).

The current study was designed to answer calls for further research on mixed-mode designs and their effect on respondent demographics and data quality; fill in gaps in the field's understanding of the effects of subsequent data collection waves on respondent demographics and response quality; and finally, expand the literature involving designs with survey mode self-selection.

Background

Few technologies have become as quickly and widely used in contemporary society as computers and the Internet. As Internet technology and the software to access the web advance and the number of users increases, social science researchers are seizing opportunities to use the web to conduct surveys for a variety of purposes including marketing, advertising, public opinion polling (Couper, 2000; McCullogh, 1998; Mosley-Matchett, 1998), and psychological testing (Denner, 1977; Elwood, 1969; Space, 1981). Electronic surveys, including both email and web surveys, have important advantages over other traditional survey modes such as lower costs, resources, dissemination time, and response time (Kiesler & Sproull, 1986; Opperman, 1995; Parker, 1992; Schaefer &

Dillman, 1998; Schmidt, 1997; Schuldt & Totten, 1994; Shannon & Bradshaw, 2002; Smith, 1997; Weible & Wallace, 1998), as well as decreased response bias (Martin & Nagao, 1989; Mazzeo & Harvey, 1988). Compared to email surveys, web surveys offer additional benefits including broader stimuli potential (color, audio, video, animation, graphics, 3D), automated piping and error-checking features (versing, complex branching, skips, pop-up messages, and features to standardize responses), and automated electronic data collection, entry and analysis (Dillman, 2000; Tourangeau, 2004; Weible & Wallace, 1998).

Given their benefits, web surveys also provide important challenges for researchers as compared to other survey modes, including sampling issues, lower response rates, lower response consistency, and technical issues (Borkan, 2006; Dillman, 2000). Web survey response rates are usually lower than mail response rates (Dillman & Bowker, 2001; Shih & Fan, 2007b), with some exceptions (Cobanoglu, Warde, & Moreo, 2001; Irani et al., 2004; Jun, 2005; Parker, 1992; Pettit, 2002; Smee & Brennan, 2000; Wu, 1997), and sometimes even lower than email response rates (Guterbock, Meekins, Weaver, & Fries, 2000; Kwak & Radler, 2002; Matz, 1999). Sample representativeness is a concern among web surveys because online and offline populations differ (Borkan, 2006; Dillman, 2000; Schaefer & Dillman, 1998; Swoboda, Muehlberger, Weitkunat, & Schneeweiss, 1997; Tse, 1998).

Given the expected increase in their use, it is important for social science researchers to understand the advantages, limitations, and influences of web survey research, yet much research is still needed as the field is relatively young. The earliest studies using computers and email for data collection were conducted around the mid-1980's (Crawford, 1982; Erdman, Klein, & Greist, 1983; Kiesler & Sproull, 1986; Nyce

& Groppa, 1983; Sproull, 1986; Sproull & Kiesler, 1986; Steinfeld, 1983). The earliest studies involving web surveys in particular are even more recent (Beniger, 1998; Kiesler & Sproull, 1986; McCullogh, 1998; Mosley-Matchett, 1998; Schmidt, 1997; Smith, 1997; Stanton, 1998).

Researchers suggest that it may be best to study web surveys by comparing them to other survey modes such as mail, email, and telephone surveys (Dillman, 2000; Kiesler & Sproull, 1986; Schaefer & Dillman, 1998) to eliminate the weaknesses of web surveys (Dillman, 2000). Such "mixed-mode" studies may be implemented sequentially (e.g., initially delivering a mail survey and then delivering an email or web survey in a follow-up reminder) or multiple modes may be administered simultaneously, permitting respondents to self-select the survey mode (Borkan, 2006; Dillman, 2000; Dillman & Tarnai, 1988; Shih & Fan, 2007b). While such designs may increase response rate and sample representativeness, they introduce a new concern regarding whether the data can be aggregated, thus studies comparing mode effects on data quality are needed (Dillman, 2000; Dillman et al., 2001; Dillman & Tarnai, 1988; Schonlau et al., 2002). Social science researchers note that questionnaire design, target population, respondent demographics, data quality and data types may be influenced by the mode by which survey data are gathered (Babbie, 2007; Dillman, 2000; Tourangeau, 2004; Tourangeau, Rips, & Rasinski, 2000). Many studies have been conducted to examine web surveys in mixed-mode designs (e.g., Borkan, 2006; Cobanoglu et al., 2001; Fiala, 2004; Guterbock et al., 2000; Hancock & Flowers, 2001; Underwood, Kim, & Matier, 2000), often producing conflicting results (Schaefer & Dillman, 1998; Shih & Fan, 2007b).

Theoretical Framework

The current study sought to examine the effects of mail and web surveys on demographics and response quality using a mixed-mode design with mode self-selection. The theoretical framework for the current study is nestled in the interface between web and mail survey theories as they are generally understood in the social sciences, with specific emphasis on respondent demographics and response quality. The current study was also expanded to include an analysis of demographics and response quality among early and late responders.

Demographics

The literature regarding gender effects on mail and web surveys is inconsistent. Among electronic surveys, some studies report more males than females (Graphics Visualization and Usability Center [GVUC], 1999; Schmidt, 1997; Sheehan & Hoy, 2000), while others report more females than males (Ayers, 2004; Borkan, 2006; McCabe, Boyd, Couper, Crawford, & D'Arcy, 2002; Witte et al., 2000). Kiesler and Sproull (1986) note that while there were more males than females in their randomly-sampled study of 151 university students and faculty/staff, "…gender…did not affect response rates" (p. 408). In mail and web surveys among college students, two studies observed more females than males in both mail and web modes because so many more females responded (McCabe et al., 2002; Underwood et al., 2000). A similar distribution was reported by Hayslett and Wildemuth (2004) among 300 academic reference librarians, but the distribution by mail and web modes was not significant, $\alpha \leq 0.05$. Borkan (2006) confirmed this finding in a randomized mail and web survey of 2,000 Ohio middle and high school teachers in which differences among mail and web respondents were not statistically significant.

Many studies suggest that more Caucasians than other ethnic groups respond to surveys regardless of the mode (GVUC, 1999; McCabe et al., 2002), but especially for web surveys (Berry, 2006; Witte et al., 2000). A nationwide web survey using a stratified random sample among 1,201 school counselors produced a response rate of 19% (n = 231), comprised of 87% females and 88% Caucasians (2% African-American, 1% American Indian, 1% Asian, and 5% Hispanic) (Berry, 2006). In contrast, Smith & Leigh's (1997) study about sexual fantasies among undergraduate students observed no differences in ethnicity.

Regarding age, the literature suggests that web survey respondents are of the same age as mail respondents (Hayslett & Wildemuth, 2004; Smith & Leigh, 1997), or younger (Palmquist & Stueve, 1996; Schmidt, 1997; Zhang, 2000). In their study of lesbians, gays and bisexuals regarding therapist selection, Kaufman et al. (1997) observed that electronic respondents were more disclosing of their sexual preferences, more educated, had higher incomes, and were younger than mail respondents. Schmidt (1997) observed that web respondents were younger and male with higher socioeconomic status and education. No age differences were revealed in Hayslett and Wildemuth's (2004) study among 300 reference librarians and in Smith and Leigh's (1997) study regarding undergraduate students' sexual fantasies.

Very few studies of professional experience effects by survey mode were found in the literature. In studies of American urologists, fewer years of physician practice and clinical experience were observed among Internet respondents as compared to mail respondents (Hollowell, Patel, Bales, & Gerber, 2000; Kim et al., 2000). Hayslett and Wildemuth's (2004) study among 300 academic reference librarians reported that 92% of

respondents had a Master of Library Science degree and 71% had worked in libraries for 10 or more years.

Response Quality

Some studies suggest that there are no differences in response quality between mail and electronic modes (Matz, 1999; Mehta & Sividas, 1995; Tse et al., 1995; Weible & Wallace, 1998; Yun & Trumbo, 2000), and no differences between mail and web modes in particular (Dillman et al., 2001; Hancock & Flowers, 2001; Saphore, 1999; Yun & Trumbo, 2000). Other studies have observed differences (Perkins & Yuan, 2001), suggesting that web surveys have better response quality than mail surveys (Weible & Wallace, 1998).

In Kiesler and Sproull's (1986) study of pronoun use, they counted the number of personal pronouns in three open-ended items. The items solicited respondents' responses regarding their most recent illness, personal habits that are bothersome, and things that elicit personal pride and satisfaction. Their analyses revealed no differences by survey mode among 151 university students and faculty/staff (Kiesler & Sproull, 1986).

Item nonresponse, one of the most commonly studied response quality characteristics, is a measure of the number of items on a survey questionnaire that were skipped but should have been answered (Pettit, 2002). In studies comparing mail and electronic surveys (assuming parallel surveys), some studies reported higher item nonresponse among mail surveys (Kiesler & Sproull, 1986) while others reported higher item nonresponse in electronic surveys (Howes & Mailloux, 2001; Mehta & Sividas, 1995; Paolo et al., 2000; Webster & Compeau, 1996). Two studies observed no differences among mail and email surveys (Tse, 1998; Tse et al., 1995). Comparing web and mail surveys, web surveys have been shown to have the same (Pealer, 1999) or lower

item nonresponse than mail surveys (Kerwin, Brick, Levin, O'Brien, & Cantor, 2006; Kiesler & Sproull, 1986; MacElroy, Mikuski, & McDowell, 2002; Schaefer & Dillman, 1998; Stanton, 1998; Truell, Bartlett, & Alexander, 2002); however, higher item nonresponse in web surveys has also been reported (Ahlstrom, 2004; Smee & Brennan, 2000; Jun 2005). For example, Jun (2005) observed 21.44 times more skipped items in web than in mail surveys. Several studies observed no differences in mail and web item nonresponse (Cobanoglu et al., 2001; Matz, 1999; Pettit, 2002). Schaefer and Dillman (1998) provide a review of studies that found conflicting results. Unlike mail surveys, web surveys can be programmed so that branching, error checking, and complex skip patterns occur automatically and pop-up windows can provide immediate feedback allowing respondents to fix incorrect or skipped responses before their survey is submitted (Schaefer & Dillman, 1998; Tourangeau, 2004). Features such as these are believed to increase a respondent's attention to survey items, producing lower item nonresponse in web surveys compared to other modes. On the other hand, they may annoy and overburden respondents, increasing item nonresponse and survey abandonment (Dillman, 2000; Dillman, Tortora, & Bowker, 1998; Smee & Brennan, 2000).

Item completion error is a measure of the number of errors on a survey questionnaire and happens when a respondent provides an invalid response (e.g., a response where one is not expected, a response that cannot be coded, illegible handwriting) (Pettit, 2002). Sometimes this is the result of a branching or data entry instruction that was not understood or followed correctly (Dillman, 2000). The literature is inconsistent, with some studies reporting no difference in item completion errors among mail and web surveys (Pealer, 1999; Smee & Brennan, 2000), and others reporting fewer item completion errors in web compared to mail surveys (Weible & Wallace, 1998;

Pettit, 2002). Smee and Brennan (2000) found no differences in their comparison of mail, email, and web modes. Kiesler and Sproull's (1986) health-related survey among 151 university students and faculty/staff reported fewer item completion errors in the email as compared to the mail survey. Of 53 items containing response errors, 5.3% were made by mail respondents and 0.0% was made by email respondents (Kiesler & Sproull, 1986).

Response length is a measure of the number of words in a respondent's response to an open-ended item. It is assumed that a longer response is indicative of better response quality because respondents provide more data (Schaefer & Dillman, 1998). Several studies have observed that web surveys surpass paper/mail surveys in producing higher quality, more sophisticated, and longer responses to open-ended items (Kiesler & Sproull, 1986; MacElroy et al., 2002; Nicholls, Baker, & Martin, 1997; Schaefer & Dillman, 1998; Wu, 1997). In a web and mail survey involving mode self-selection (n = 1,228), a mean of 48.2 words was revealed for the web mode compared to a mean of 32.0 words for the mail mode for a "Use this space to add some final thoughts" open-ended item (MacElroy et al., 2002).

Yea-saying is the tendency of a respondent to agree with item statements or questions independent of the item's content (Greenleaf, 1992) as evidenced by a response that is located near or at the affirmative anchor of a list of response options (Kiesler & Sproull, 1986). Two studies of yea-saying were found, both revealing no differences by survey mode (Kiesler & Sproull, 1986; Weijters, Schillewaert, & Geuns, 2004). In a study conducted by Kiesler and Sproull (1986) comparing paper and electronic surveys, yea-saying was measured among 151 randomly-selected university students and faculty/staff using five forced-choice items. The items solicited participants' attitudes on health-related topics using a seven-point Likert response set where "Agree" equals one and

"Disagree" equals seven. ANOVAs revealed no differences by survey mode (Kiesler & Sproull, 1986).

Response extremity occurs when a respondent favors (or avoids) the extreme anchors (e.g., "strongly agree" or "strongly disagree" in a Likert scale) of a response scale (Greenleaf, 1992; Kiesler & Sproull, 1986; Naemi, 2006; Pettit, 2002). There is considerable variation in the way response extremity is measured in the literature (Naemi, 2006), with some studies counting use of both extreme anchors in Likert-type response sets (Berg & Collier, 1953; Booth-Kewley, Edwards, & Rosenfeld, 1992; Greenleaf, 1992; Pettit, 2002; Soueif, 1958; Sproull, 1986), and others counting use of only the most extreme positive response option (Brengelmann, 1960). Most studies reported no difference in response extremity among mail and electronic survey modes (Booth-Kewley et al., 1992; Dillman et al., 2001; Helgeson & Ursic, 1989; Petit, 2002), with one exception (Sproull, 1986). Pettit (2002) observed no differences between web and paper modes in a comparison of personality questionnaires. Booth-Kewley et al.'s (1992) study among 246 Navy recruits also reported no differences between a computer survey with backtracking (e.g., respondents could return to previous pages and change their responses), a computer survey with no backtracking, and a paper survey. In contrast, Sproull's (1986) survey among 60 business professionals in a *Fortune 500* company reported more extreme responding in email than in paper surveys. This study examined 48 hypothetical task items with response anchors scaled from zero to 10 where zero and 10 were coded as extreme responses (Sproull, 1986).

Response equivalency is a measure of differences in the mean scores among items or collapsed item groups having ordinal, interval, or ratio level data. Researchers suggest that responses across surveys modes in general are not equivalent (Dillman, 2000;

Sudman, Bradburn, & Schwarz, 1996) due to differential effects on responses resulting from each mode's degree of impersonality, perception of legitimacy, and level of cognitive burden imposed on the respondent (Tourangeau et al., 2000, p. 20). A review of the literature revealed one study comparing paper and email that observed a difference in response equivalency (Miller, Daly, Wood, Brooks, & Roper, 1996), but most mail and electronic survey studies reported no differences (Bachmann, Elfrink, & Vazzana, 1996; Booth-Kewley, et al., 1992; Hayslett and Wildemuth, 2004; Helgeson & Ursic, 1989; Mehta & Sividas, 1995; Pettit, 2002). In a study comparing personality questionnaires in web and paper modes, Pettit (2002) observed no differences in mean scale scores and no differences in internal consistency by survey mode. Helgesen and Ursic (1989) examined the equivalency of decision processes among 126 randomly assigned undergraduate business students via electronic and paper surveys, observing no statistically significant differences in response equivalency and item ordering effects by survey mode. Booth-Kewley et al.'s (1992) study among 246 Navy recruits reported no difference in response equivalency between paper, computer with backtracking, and computer without backtracking surveys.

The current study also sought to examine multiple response use as well as response length and pronoun use among anecdotal comments. Pettit (2002) defined multiple response use as follows: "The total number of items for which…two or more options were selected" (p. 52). Hayslett and Wildemuth (2004) noted in their study among 300 academic references librarians that it occurred in their mail and web survey due to the use of check boxes in the mail survey versus radio buttons in the web survey. In the web survey, the use of radio buttons prevented respondents from selecting more than one response option; however, some mail survey respondents checked two or more

responses on their mail surveys. Two studies were found in the literature that mentioned multiple response use, but one discarded the multiple responses (Hayslett & Wildemuth, 2004) while the other (Pettit, 2002) analyzed it in as one of five types of errors measured collectively as response errors. The current study sought to examine this phenomenon in greater detail by creating a variable to count the number of responses that would have otherwise been discarded.

Hayslett and Wildemuth (2004) noted another problem in their study, the use of anecdotal comments by mail respondents but not by web respondents. They explained that some mail respondents wrote notes on their paper surveys regarding items they thought were ambiguous or didn't understand, to describe how they interpreted an item, and to clarify their responses. The web survey design, however, prevented web respondents from writing such comments. They suggested adding text boxes at key points throughout the web survey to capture anecdotal comments, but noted that web respondents would still not be able to draw lines, circle portions of items, or write nontextual annotations as mail respondents could (Hayslett & Wildemuth, 2004). The current study created variables to analyze anecdotal comments for response length and pronoun use.

Early and Late Responders

"Early responders" refers to survey participants who respond to an initial request to participate in a survey, while "late responders" refers to those who participate only after one or more reminders (Bostick et al., 1992). Studies have reported few or no differences between early and late responders in demographics (Bostick et al., 1992; Fraze, 1986; Gillispie, 1997; Goudy, 1976; Irani et al., 2004; Sobal & Ferentz, 1989) and substantive questions (Bostick et al., 1992; Goudy, 1976; Sobal & Ferentz, 1989), while

others have reported differences in demographics (Dallosso et al., 2003) and response quality (Bostick et al., 1992). Combining demographics and response quality, Sobal and Ferentz (1989) conducted a national mail survey among 1,010 physicians to examine differences in demographics, substantive questions, and response quality among the first and second mailings. Results after an 82% return rate revealed no differences by response wave in demographics (age, gender, type of residency, or region of the country), substantive questions regarding respondents' residency, use of "don't know" responses, or item nonresponse. They concluded that responses to the second mailing did not change the sample's representativeness or the study's substantive results (Sobal & Ferentz, 1989).

Research Questions

The objective of the current study was to compare the demographic characteristics and response quality among mail and web surveys when respondents are allowed to self-select the survey administration mode. Specifically, this study addressed the following research questions:

1. Does a difference exist in demographic characteristics by survey mode or response wave?
    a) Does a difference exist in gender by survey mode or response wave?
    b) Does a difference exist in ethnicity by survey mode or response wave?
    c) Does a difference exist in age by survey mode or response wave?
    d) Does a difference exist in professional employment by survey mode or response wave?
2. Does a difference exist in response quality by survey mode or response wave?

a) Does a difference exist in pronoun use by survey mode or response wave?

b) Does a difference exist in pronoun use in anecdotal comments by response wave?

c) Does a difference exist in item nonresponse by survey mode or response wave?

d) Does a difference exist in response extremity by survey mode or response wave?

e) Does a difference exist in yea-saying by survey mode or response wave?

f) Does a difference exist in item completion errors by survey mode or response wave?

g) Does a difference exist in response length by survey mode or response wave?

h) Does a difference exist in the response length of anecdotal comments by response wave?

i) Does a difference exist in response equivalency by survey mode or response wave?

j) Does a difference exist in multiple response use by response wave?

3. Do demographic characteristics and response quality predict survey mode or response wave?

a) Do demographic characteristics and response quality predict survey mode?

b) Do demographic characteristics and response quality predict response wave?

Significance of the Research

Dillman notes, "The newness of Internet (e-mail and Web)…surveys means that virtually no research has addressed the potential mode differences that might be associated with these methods." As self-administered methods, "…a priority in research is to determine the extent to which these methods…may mirror paper self-administered surveys" (2000, p. 232). Several studies comparing mail and web surveys have been conducted since Dillman's call for further research (Jun, 2005; Kaplowitz, Hadlock, & Levine, 2004; Kwak & Radler, 2002; Ladner, 2003; McCabe, et. al., 2002; McElroy, et. al., 2002; Mertler, 2003; Sedwick, 2003; Shannon & Bradshaw, 2002; Yun & Trumbo, 2000); however, these studies have produced conflicting results. Even fewer studies have examined the effects of allowing respondents to self-select the survey mode (McElroy, et. al., 2002; Yun & Trumbo, 2000). Yun & Trumbo (2000) conducted a survey involving respondent mode self-selection that compared the cost, sampling representativeness, response rate, and mean values of variables across mail, email, and web surveys. They observed that multi-mode surveys improved the representativeness of a sample without biasing results (Yun & Trumbo, 2000). A more recent study involving mode self-section compared web and mail surveys with respect to item response rates for closed-ended items and the length and quality of responses for open-ended items (McElroy, et. al., 2002). This study observed that web responses have a greater number of words, characters, unique concepts, and sentences per response than mail survey responses. A Flesch-Kincaid Grade Level analysis of those survey responses shows that web responses

were written at the 9th grade level and mail responses were written at the 8th grade level (McElroy, et. al., 2002).

Among the important values of contemporary American society is choice. Giving people access to options for them to participate is paramount in a democratic society. This is evident in the choices offered to American voters casting ballots for public elections: punch cards, paper-and pencil in-person, paper-and-pencil absentee, mark sense (bubbles filled in and read with an optical scanner), electronic using a keyboard or a touch-screen monitor (data are not collected via the Internet), and the Internet (pilot-tested by the military during the 1996 presidential election) (Napoli, 2006). But, does this translate to survey research? Given the expected rise in the use of web surveys alone as well as in combination with other modes, it's important to understand their effects. The results of the current study will be useful to survey researchers and practitioners who make important decisions based on data collected with mail and web surveys. Hence this study is significant for the following reasons:

1. Given that survey technologies are rapidly advancing, this study contributes important and timely empirical data necessary to advance the field's understanding of web surveys as they compare to mail surveys.
2. This study contributes empirical data to the understanding of mixed-mode survey methodologies, especially to the understanding of the effects on data quality in studies with mode self-selection. This is important because the literature is inconclusive in this area.
3. This study responds to calls for further research regarding which survey modes are preferred in specific populations when participants are given the choice (Shih & Fan, 2007b), as well as calls for further research comparing survey

modes (Dillman, 2000). When multi-mode designs are not possible, these findings may help researchers and practitioners make informed decisions regarding which mode is best.

4. This study is unique in that no other studies were found to have been conducted with this population using this design. While similar designs have been used in other social science fields such as business and market research, this kind of study will fill a gap in the field of survey research conducted among public school guidance counselors. Knowledge in this area is important given the size and diversity of the population, the expected increase in the use of web surveys in studies involving them, and the impact that the population has on American education.
5. Findings from this study are useful to researchers and practitioners conducting nonexperimental survey research using combined mail and web administration modes. Understanding the effects of respondent self-selection is important because randomly assigning respondents to survey modes is not always practical or possible in social science research.

Delimitations

Findings from this study should be interpreted within the context of the following delimitations:

1. The current study used a dataset derived from a larger study that had already been completed. As such, the current study's design was restricted by the circumstances of the larger study. Nonrandom sampling and survey mode self-selection limited generalizability and the instrument's item content and structure prevented an analysis of instrument reliability. Survey items were

fixed, possibility producing an order effect among responses. Additionally, the current study's dataset was stripped of all identifying variables to ensure respondents' confidentiality. Thus, it was not possible to contact respondents to clarify vague or incomplete responses, verify data, or conduct cognitive interviews.

2. School principals verified the names of participants on the sampling frame list and disseminated surveys to participants. While it is assumed that principals provided accurate data and disseminated surveys in a consistent and timely manner, this cannot be confirmed.
3. As their initial contact, participants received a mail survey with the web survey's URL address version printed on the cover. This was necessary because participants' emails were not available. Web survey respondents had to take the extra initiative to locate a computer, connect to the Internet, and type in the URL address to access the web survey.
4. It's assumed that web survey respondents completed their surveys using computers with the appropriate hardware, software, and Internet connectivity for the survey to display correctly; however, this cannot be confirmed.
5. It's assumed that web respondents were sufficiently computer literate to locate the survey web site, navigate within a web page, provide responses using a keyboard, and submit the survey electronically; however, this cannot be confirmed.
6. While this study used a common instrument in two different modes to examine mode effects, the instrument itself may affect results.

7. This study is valid only for the population, setting, and time period defined herein.

Definitions

The following terms have been defined to promote a better understanding of their use in the context of the current study.

Anonymous: A respondent's identity cannot be determined by anyone, including the researcher (Babbie, 1990).

Branching: Instructions on a questionnaire that provide direction to an interviewer or respondent regarding how to move through a questionnaire (Alreck & Settle, 1995).

Browser: Computer software that receives and interprets hypertext data facilitating navigation of the World Wide Web and Internet and the displaying f web pages. Examples of browser software include Microsoft Internet Explorer and Netscape Navigator.

Census: Studying all members of a population rather than sampling a portion of the population to represent the whole (Alreck & Settle, 1995).

Click: Placing a computer mouse pointer over an action button on a computer screen, and then pushing the mouse button to initiate an action.

Client: A software program that facilitates access to a server from another computer.

Computer-Assisted Personal Interview (CAPI): Face-to-face interview in which the interviewer asks questions that appear on a portable computer, and then types the respondent's answers into the computer during the interview.

Computer-Assisted Self-Administered Interview (CASI): Interview in which a respondent reads questions on a computer screen and types responses into the computer in the

absence of an interviewer. Also "Computerized Self-Administered Questionnaire."

Computer-Assisted Telephone Interview (CATI): Interview in which an interviewer calls a respondent on the telephone, asks the respondent questions that appear on a computer screen, and types the respondent's answers into the computer during the interview (Babbie, 2007).

Computer-Based Survey: A survey that uses any type of computer (mainframe, desktop, laptop, hand-held, etc.) to gather survey responses and may or may not be connected to the Internet. Responses are automatically entered into a database.

Confidential: Survey in which a respondent's identity can be determined by at least one member of a research team, but the respondent is guaranteed that his/her identity will be kept a secret (Babbie, 1990).

Contingency Item: A survey item presented to all respondents, that is then followed by a sub-item for only those respondents who provided a specific response (Babbie, 2007).

Demographics: Conditions or attributes that are assigned to people to facilitate putting people into groups (Alreck & Settle, 1995). In survey research, demographics are used to determine if specific groups are represented by a sample and to make comparisons among groups. Examples include race/ethnicity, age, gender, marital status, income, education, employment, and socioeconomic status.

Email (Electronic Mail): Messages that can be exchanged electronically from one computer to another (usually over the Internet or an intranet) via some kind of connection such as a dial-up telephone line, a cable, or a wireless connection.

Email Survey: Survey that involves a questionnaire typed into the text of an email message that is disseminated to and returned from a respondent electronically via a computer and the Internet or an intranet. Respondents participate by editing the original email message to include their responses. The researcher manually enters responses into a database for analysis.

Face-to-Face Interview: Interviews in which an interviewer and respondent are in each other's presence while the interview is being conducted and during which the interviewer records the respondent's responses.

Forced-Choice Items: Survey items that present a statement or question to which the respondent provides an answer by selecting from among a list of responses supplied by the researcher (Babbie, 2007). True/false and multiple choice and examples of forced-choice items. Also called "closed-ended" items.

Hardware (Computer Hardware): The physical devices and components of a computer (Alreck & Settle, 1995).

Hit: A single request from a computer's World Wide Web browser for a single item from a Web server. Hits are commonly counted and used to determine how often a web page is visited.

Home Page: A specific web page designated as the entry point, main page or first page of a website.

Host: A computer on a network that stores services that can be accessed by other computers on the network. Such a computer may act as a "host" for a client's web survey.

Hyperlink: A reference point in a web page or document such as text or an image that an individual can click on to retrieve a document, be taken to another place within a page, or be taken to another website.

Hypertext: Text that contains hyperlinks that, when clicked on, automatically forward the user to another place on a page, to another page within a website, or to another website.

HyperText Markup Language (HTML): The coding language used to create web pages and hypertext documents that can be used on the World Wide Web.

HyperText Transfer Protocol (HTTP): The protocol for moving hypertext files across the Internet.

Incentive: A reward such as money, a gift certificate, a prize, a drawing entry, etc. designed to motivate an individual to behave in a specific way. Incentives are sometimes used to encourage participants to respond to a survey.

Interactive Voice Response (IVR) Survey: Survey in which a computer calls a telephone number and then presents recorded questions to a respondent, to which a respondent responds by speaking or selecting appropriate numbers on the telephone's numeric touch-tone keypad.

Internet: The cooperative, global network of millions of linked computers that exchange information electronically using TCP/IP protocols.

Internet Literacy: The essential knowledge that an individual needs in order to function independently on the Internet.

Internet Protocol (IP) Address: A unique numerical address assigned to a computer that distinguishes one computer from others when communicating via the Internet.

Internet Service Provider (ISP): An entity that provides Internet access for individuals.

Interview: A face-to-face or telephone data collection encounter in which an interviewer asks questions of a respondent (Babbie, 2007).

Intranet: A network within an organization that uses the same mechanism as the Internet, but is for organization members only and is closed to public access.

Item Completion Error: Instances in which a respondent provides an incorrect response or a response where one was not expected.

Item Nonresponse: Instances in which a respondent skips an item that should have been answered.

Likert Scale: A type of scale (usually five-point) used to rate a respondent's level of agreement or disagreement with a statement (Alreck & Settle, 1995).

Link: A phrase containing numbers and characters (e.g., http://www.wmich.edu) that is the World Wide Web address to a web page.

Listserve: An electronic mailing list.

Mail Survey: A paper questionnaire that is delivered and returned via a mail carrier such as the United States Postal Service or interoffice mail. Also referred to as "traditional," "postal," "hard-copy," "surface mail," "paper," "paper-and-pencil," and "snail mail" surveys.

Multi-Mode Survey: A survey that involves any two or more of a variety of available questionnaire formats, such as interview, computer-assisted, email, web, and mail formats.

Newsgroup: An Internet resource where people post and read messages related to a specific topic.

Nonresponse Rate: Survey nonresponse rate is a measure of the number of respondents who did not participate in a survey divided by the total number of participants

invited to participate (Fraenkel & Wallen, 2006). Item nonresponse rate is a measure of the number of items on a survey questionnaire that a respondent skipped but should have answered (Fraenkel & Wallen, 2006).

Open-Ended Items: Survey items that present a statement or question to which the respondent writes an answer in their own words (Babbie, 2007).

Probe or Probing: An interview technique in which an interview uses nondirective phrases or questions (e.g., Anything more?) to solicit a more complete response to a respondent's incomplete or vague response (Babbie, 2007).

Questionnaire: A document containing items used to solicit data from individuals for analysis (Babbie, 2007).

Reliability: The repeatability of a measure.

Respondent: An individual who provides data to be included in a research study by responding to items on a survey questionnaire (Babbie, 2007).

Response Equivalency: A comparison of the mean scores of selected items or collapsed item groups to determine if statistically significant differences exist in the means.

Response Extremity: A respondent's use of the most extreme response option among a range of forced-choice responses in a Likert or Likert-type scale.

Response Length: The number of words written in response to an open-ended item.

Response Quality: The extent to which survey responses contribute accurate and informative data to a study.

Response Rate: The percentage of useable surveys that are returned (or people participating in an interview) divided by the number of surveys delivered (Babbie, 2007).

Self-Administered Questionnaire: A questionnaire that is read and completed by a respondent in the absence of an interviewer and without the assistance of a survey administrator.

Server: A computer or software application that provides a service to other computers. In survey research, the server is where the questionnaire is located and is "served" to a respondent when the respondent accesses it.

Socially Desirable Response: Response bias that results when an individual's response is based on what the individual believes is socially acceptable or provides a better impression of themselves rather than on what is really true. Also called social desirability bias.

Software (Computer Software): The programs, coded instructions, and applications of a computer (Alreck & Settle, 1995).

Survey: A research design in which a sample of individuals selected from a population is systematically questioned and then results are analyzed and generalized back to the population (Alreck & Settle, 1995).

Survey Mode: The manner by which a survey is administered to respondents (e.g., mail, email, web, face-to-face interview, telephone interview, etc.).

Telephone Survey: Survey in which an interviewer calls a respondent on the telephone, asks the respondent each survey question, and records the respondent's answers. Also called a telephone interview.

Transmission Control Protocol/Internet Protocol (TCP/IP): Transmission Control Protocol converts messages from their source into electronic data packets for transmission and then back into messages at their destination. Internet Protocol

handles addressing functions that permit electronic data packets delivered across multiple networks to be sent and received correctly.

Uniform Resource Locator (URL): The unique address of an Internet resource (e.g., a web page) that is located on the World Wide Web.

Web Page: A document on the World Wide Web with a unique URL address.

Web Survey: An electronic survey questionnaire created on the Internet or World Wide Web as a web page. Respondents access the survey's web page, respond to items as they appear on the computer screen, and then submit the survey electronically. Web surveys may include color, audio, video, animation, graphics, complex branching, and skip patterns, pop-up messages, pull-down menus, checkboxes, radio buttons, fill-in text boxes, scrolling windows, and features to standardize responses. Also referred to as "web-based," "online," or "Internet" surveys.

World Wide Web (WWW): A hypertext-based Internet server system that maintains html-formatted data including text, graphics, audio, video, and databases.

Yea Saying: The number of instances in which a respondent selects a positive or "yes" response.

Organization of the Dissertation

Chapter 1 of this dissertation provides an overview of the study. It introduces the problem, provides the background, lists the research questions, explains the significance of the research, addresses delimitations, and provides a list of definitions for key terms used throughout this document. Chapter 2 presents a review of the literature. It presents a brief history of survey research, describes some of the main characteristics of surveys, compares survey administration modes, and then reviews the literature relative to the study's research questions. Chapter 3 describes the methodology used in the study. It

describes the study's design, explains the use of a dataset drawn from a larger study, reviews the research questions, introduces the variables with their constitutive and operational definitions, describes the survey instrumentation, details the data collection and sampling procedures, and finally explains the analyses used to answer the research questions. Chapter 4 presents the study's findings for each research question. Finally, Chapter 5 presents a discussion of the study's findings. It reviews the results from Chapter 4 in the context of the literature, describes the study's limitations, and then addresses practical implications and recommendations for future research.

CHAPTER II

LITERATURE REVIEW

Chapter 2 presents an introduction to the current study and is arranged into three sections. The first section presents a brief history of survey research. The second section describes some of the characteristics of survey research, such as questionnaire design, costs, incentives, response rate, and a comparison of early and late responders. The third section describes survey research modes. This section compares self-administered and interview surveys, discusses modes effects and the use of mixed-mode mail and web surveys, and concludes with respondent demographics and response quality.

Brief History of Survey Research

Surveys typically administer a questionnaire to a sample selected from a population, and then use that data to describe, explain or predict the attitudes, knowledge, skills, opinions, feelings, behavior, needs, affiliations, demographics, or lifestyles of the population (Alreck & Settle, 1995; Babbie, 2007; Fink, 1995; Fink, 2006; Fraenkel & Wallen, 2006; Schonlau et al., 2002). The practice of using surveys and censuses has been noted throughout history dating back as far as ancient Egyptian civilizations where rulers used censuses to gather data about their subjects (Babbie, 1990; Babbie, 2007). One of the first political attitudinal surveys was employed in 1880 by Karl Marx, a German political sociologist, who mailed 25,000 questionnaires to French workers to solicit their views regarding employer exploitation (Babbie, 1990; Babbie, 2007).

The individuals credited as the pioneers of contemporary survey research are Samuel A. Stouffer and Paul F. Lazarsfeld (Babbie, 1990). Stouffer's work focused on applying empirical research methods to study social phenomena, contributing much contemporary survey methodology's design, sampling, instrumentation, and analysis.

Lazarsfeld also advanced the application of empirical methods to social research, but his main contributions include using mechanized data processing equipment to analyze survey data, and the development of permanent centers such as Columbia University's Bureau of Applied Social Research to study and advance the field of survey research (Babbie, 1990).

Babbie (1990) notes that contemporary survey research is mainly a product of 20th century American research in three sectors of American society: the U.S. Bureau of the Census, commercial and political polling companies, and scientific survey research by American universities. The U.S. Bureau of the Census has made important contributions to survey sampling, design, and data collection. Best known for the U.S. Census, which has been conducted every 10 years since 1790, the Census Bureau uses additional surveys to collect data between censuses, and maintains current demographic and economic data that are used by researchers in a variety of marketing and social service fields (Babbie, 1990). Today, surveys are used for policymaking, planning, assessment, and evaluation (Fink, 2006), and comprise the most common method of data collection in education research (Ary et al., 2002).

Surveys have also advanced with technology. Telephone surveys were popular in the 1960s and 1970s as telephones became more common in households (Tourangeau, 2004). Computer-based surveys such as computer-assisted telephone interviewing (CATI) and computer-assisted personal interviewing (CAPI) followed in the 1970s through 1990s as the use of desktop and laptop computers increased (Couper et al., 1998; Tourangeau, 2004). The earliest studies using computers and email for data collection were conducted around the mid-1980's (Crawford, 1982; Erdman et al., 1983; Kiesler & Sproull, 1986; Nyce & Groppa, 1983; Sproull, 1986; Sproull & Kiesler, 1986; Steinfeld, 1983). Today,

interactive voice response (IVR) surveys are common and, with the advent of the Internet and Word Wide Web, email and web surveys are common and continually advancing. Survey research has become a multibillion dollar industry, with much attention devoted to understanding its methodologies and applications.

Several national and international professional associations exist today that use annual conferences and peer-reviewed journals to study emerging survey research trends and methodologies, including the American Association for Public Opinion Research, American Statistical Association, Centre for Survey Research and Methodology (ZUMA) in Germany, International Association of Survey Statisticians, Statistical Society of Canada, and World Association of Public Opinion Research. Associations that provide conferences and journals for examining survey research relevant to specific fields include the American Educational Research Association, American Evaluation Association, American Marketing Association, American Political Science Association, American Sociological Association, Association for Research on Nonprofit Organizations and Voluntary Action, and Visitor Studies Association among others.

Survey Research Characteristics

In discussions of survey research, the term "survey" is used interchangeably to describe a survey instrument such as a questionnaire, as well as to describe the entire process of surveying from planning to conduct a survey to reporting results. The process of survey research is comprised of several steps: defining survey research objectives, identifying the type of data to be collected and the precision of results, specifying a population, developing a sampling frame, determining a sample size, selecting a sample using random or nonrandom methods, selecting one or mode survey response modes (e.g., mail, web, interview), designing items, designing and field testing a survey instrument,

disseminating the survey dissemination and follow-up reminders, and finally collecting, coding, cleaning, reducing and analyzing data (Babbie, 1990; Babbie, 2007; Dillman, 2000; Fink, 2006; Fraenkel & Wallen, 2006; Schonlau et al., 2002). Additional considerations in survey research include response rate, data quality, questionnaire features (e.g., appearance, length, item design), timeliness of results, cost, resource requirements (e.g., staff, equipment, supplies, postage, printing, training, travel), confidentiality, ethics, and politics (Babbie, 1990; Wu, 1997). Compared to other research methods, survey research tends to be less expensive, permits greater standardization in data collection, and permits sampling a large population (Babbie, 2007).

Questionnaire Design

The design of a questionnaire and the order of items are critical to obtaining a good response rate with accurate data (Babbie, 2007; Bishop & Smith, 2001; Dillman, 2000). Objective items in a survey questionnaire should be placed at the beginning, while sensitive and demographic items should be placed near the end (Fink, 2006). In a study of the impact of item order, Benton and Daly (1991) found that less educated respondents were more influenced by item order than more educated respondents. Babbie (2007) suggests that items should be designed according to the following guidelines: items (e.g., force-choice vs. open-ended items) should be appropriate for the study, be clear and precise, ask about only one topic at a time, be relevant to the respondent, be as short as possible, be stated in non-biased and non-negative terms, and respondents must be both competent and willing to answer the items (p. 245-251). The questionnaire should also contain clear instructions and should be field-tested and revised before use (Babbie, 2007; Fraenkel & Wallen, 2006). Overall questionnaire length needs to be appropriate for

respondents, aesthetically appealing, and easy to complete (Fink, 2006). A questionnaire length of no more than four pages is suggested for optimum response rates (Heberlein & Baumgartner, 1978; Yammarino, Skinner, & Childers, 1991).

The survey in the current study was designed with general objective items at the beginning, more content-specific items in the middle, and demographic items at the end. Instructions and items were designed following suggested guidelines and the survey was field-tested prior to use. The length of the mail survey, excluding the front and back cover pages which contained no survey items, was 14 pages, each 8.50 x 7.00 inches.

Costs

All surveys, regardless of mode, have financial costs that researchers must consider. Depending on the survey mode, costs can be incurred for human labor, postage, paper and printing, telephone calls, and computer equipment, among others. Costs can also be influenced by sample size, study complexity, time, the availability of resources, and researcher skills. Survey researchers must carefully weigh the costs of each survey mode against potential benefits (e.g., response time, data quality) given study populations, circumstances and constraints in order to determine the most appropriate survey mode.

Human labor is a substantial, but often over-looked expense. Holding all other survey factors constant, human labor costs associated with survey design, participant list compilation, and data analysis vary little across survey modes, but do differ across mode for instrument dissemination and data entry (Schonlau et al., 2002). Regarding personnel costs, the most expensive surveys to conduct are face-to-face surveys followed by telephone surveys due to interviewer labor. Both modes incur expenses associated with training interviewers and conducting interviews. Face-to-face surveys (and sometimes telephone surveys) also have costs associated with scheduling interviews. Face-to-face

surveys have additional costs associated with interviewers' travel time. Mail surveys don't have interviewer costs, but do have labor costs associated with assembling survey packets as well as printing and mailing questionnaires. Face-to-face interviews, telephone interviews, mail and email surveys each require data entry clerks to code responses and then enter data into an electronic format for analysis.

Holding survey sample size constant, other costs across survey mode are lesser concerns and vary with survey complexity (Schonlau et al., 2002). Costs for interviewer mileage expenses for face-to-face surveys, phone calling expenses (including long distance and CATI programming) for telephone surveys, and printing, paper supplies, and postage expenses for mail surveys seem to be similar overall (Schonlau et al., 2002). Schonlau et al. (2002) note that the labor cost for one day of a researcher's time for a mail survey corresponds to the cost of printing and mailing several hundred questionnaires costing three to four dollars each (p. 11-12). If preparing a survey budget, Weible and Wallace (1998) suggest planning for the following costs per 100 participants with $20.00/hour for human labor and $0.05/printed page: $215 for a mail survey, $113 for a faxed survey, and $77 for either an e-mail survey or web survey.

Costs in Mail and Electronic Surveys. Electronic (email and web) surveys are generally less expensive than mail surveys (Weible & Wallace, 1998), because they use less paper, postage and human labor. Email and web surveys minimize or eliminate costs associated with paper, labels, envelopes, printing, postage, and human labor to prepare surveys for mailing and process returned surveys. Several studies show that mail surveys are more expensive than email surveys (Bachmann et al., 1996; Kiesler & Sproull, 1986; Mertler, 2002; Parker, 1992; Schaefer & Dillman, 1998; Sproull, 1986), but determining the costs

for human labor in email surveys may be difficult to calculate and easy to overlook (Bachmann et al., 1996).

Web survey use has exploded due to its low costs relative to mail, face-to-face interview and computer-assisted telephone surveys, as well as its ability to quickly process, return, and analyze massive amounts of data (Dillman & Bowker, 2001; Yun & Trumbo, 2000). Web surveys have even been shown to be less expensive than email surveys (Mertler, 2002; Watt, 1999). Web surveys that compile data electronically substantially reduce or eliminate costs associated with converting data into an electronic format for analysis, reducing or eliminating human data entry error. Watt (1999) found that the typical cost per 10,000 respondents is $0.65 for a web survey versus $1.64 for an email survey, both less expensive than a mail survey, and the cost of electronic surveys per respondent decreases as the sample size increases. He notes, however, that initial human labor costs for a web survey may be higher than mail surveys due to programming, questionnaire design, and computer network maintenance (Watt, 1999). Mertler (2002) observed a total cost of $120 for a web survey and $4,000 for a mail survey. In one multi-mode study comparing mail, email and web surveys, electronic survey costs were higher compared to mail as the electronic survey involved a full mailing as well as electronic delivery, and considerable time was spent developing and administering the web survey and managing email (Yun & Trumbo, 2000). Weible and Wallace (1998) argue that the convenience and lower cost benefits of electronic surveys can make up for their decreased response rates.

Incentives

The literature on incentives suggests that response rate increases when respondents are given incentives for their participation (Babbie, 2007; Dillman,

Carpenter, Christensen, & Brooks, 1974; Dillman, 2000). Examples of incentives include money, gifts or gift certificates, donation to a charity, lottery prize drawings, and copies of research reports. Some researchers suggest that providing incentives may affect response quality or sample representativeness, while others argue there is no effect. More research is needed to determine the effect of incentives. Due to the large sample size (*N*=2,880) in the current study, cash and gift incentives were not provided for survey respondents. Rather, respondents were informed of the importance of their comments to the study and were given an opportunity to receive a copy of the final report.

Response Rate

The response rate is a measure of the number of individuals returning completed surveys divided by the number of individuals in a sampling frame, expressed as a percentage (Babbie, 2007). Response rate is an important value reported in survey research studies because it's an indicator of a sample's representativeness and the validity of its findings (Rylander, Propst, & McMurty, 1995). A higher response rate is generally associated with lower nonresponse error (Babbie, 1990; Underwood et al., 2000), thus increasing generalizability and confidence that the sample accurately reflects the population (Rylander et al., 1995). Nonresponse error is the error created by individuals in a sample who do not respond to a survey, but if they had responded, would have provided different answers than those of individuals who did respond (Fraenkel & Wallen, 2006; Groves, 1989).

Researchers desire to achieve the highest response rates possible within given constraints (e.g., time, cost, resources), believing that low response rates threaten a survey's utility. In a study of theoretical models of survey participation, Groves and Couper (1998) have shown that respondents and nonrespondents differ systematically.

However, some studies challenge this belief (Curtin, Presser, & Singer, 2000; Keeter, Miller, Kohut, Groves, & Presser, 2000). Keeter et al. (2000) compared the results of two identical telephone surveys conducted under different levels of effort. The "Standard" survey was conducted among a nonrandom sample over a five-day period, and the "Rigorous" method was conducted among a random sample over an eight-week period and included a $2.00 incentive. Response rates were 36% for the standard method and 61% for the rigorous procedure. Results for 91 comparisons revealed that the two surveys produced similar results with an average difference of 2% among responses, mainly in demographic items, and no differences exceeding 9%. Curtin et al.'s (2000) study comparing the responses of surveys with 60-70% response rates to those with 20-40% response rates revealed minimal differences in substantive responses.

Response Rates for Mail and Electronic Surveys. Studies reviewing the literature report that email response rates vary widely (Sheehan & McMillan, 1999) from as low as 6-19% to as high as 73% (Opperman, 1995; Weible & Wallace, 1998), and mail survey response rates vary from 27 to 56 percent (Weible & Wallace, 1998). In a comparison of mail and electronic (email and web) response rates by mode, electronic survey response rates are generally believed to be similar to (Smith, 1997; Truell et al., 2002; Vazzana & Bachmann, 1994) or lower than (Bachmann et al., 1996; Bachmann, Elfrink & Vazzana, 1999; Dillman & Bowker, 2001; Dillman et al., 2001; Fiala, 2004; Hayslett & Wildemuth, 2004; Hollowell et al., 2000; Jones & Pitt, 1999; Kiesler & Sproull, 1986; Kim et al., 2000; Kittleson, 1995; Matz, 1999; Mertler, 2003; Paolo et al., 2000; Schuldt & Totten, 1994; Shih & Fan, 2007a; Shih & Fan, 2007b; Tse, 1998; Tse et al., 1995; Underwood et al., 2000; Weible & Wallace, 1998) mail surveys. Web survey response rates in particular are usually lower than mail response rates (Dillman & Bowker, 2001;

Quigley, Riemer, Cruzen, & Rosen, 2000; Shih & Fan, 2007b), although Jun's (2005) survey about health behaviors among 1,000 undergraduate university students revealed no difference in mail (38.3%) and web (35.2%) survey response rates.

To compare the response rate effect of paper versus email invitations to web surveys, Hayslett and Wildemuth (2004) conducted a survey among 300 randomly sampled North Carolina academic reference librarians. One hundred participants were randomly assigned to each of three groups: mail survey with a mail invitation, web survey with a mail invitation, and web survey with an email invitation. Results revealed response rates of 43.2% (n = 51) usable surveys for the mail mode with mail invitation, 22.9% (n = 28) for the web survey with paper invitation, and 33.1% (n = 39) for the web survey with email invitation. Differences between the three formats were statistically significant, $p \leq 0.05$ (Hayslett & Wildemuth, 2004).

A recent meta-analysis of 35 studies comparing mail and email surveys reported that email responses rates were 20% lower than mail response rates (Shih & Fan, 2007a). A meta-analysis of 43 studies comparing mail and web surveys reported that web response rates were 8% lower using an unweighted mean (14% lower using a weighted mean) than mail response rates (Shih & Fan, 2007b). Concerning just mail surveys, a meta-analysis of 31 studies from 1986 to 2000 suggests there has been a steady decline in mail survey response rates from an average of 46% in 1995-96 to an average of 31% in 1998-99 (Sheehan, 2001). It appears, though, that despite a possible decrease in mail survey response rates, mail surveys still exceed electronic survey response rates.

Web survey response rates that exceed mail response rates are less common in the literature (Cobanoglu et al., 2001; Irani et al., 2004; Parker, 1992; Pettit, 2002; Smee & Brennan, 2000; Wu, 1997), possibly due to studies using populations more familiar with

technology and the Internet (Kaminer, 1997; Wu, 1997), as well as using populations with a high number of undeliverable email addresses (Schuldt & Totten, 1994). For example, a survey of 140 AT&T employees worldwide produced response rates of 60% for email and 38% for mail (Parker, 1992). This same study noted a mode preference effect when respondents self-selected the mode: 28% of respondents invited via e-mail subsequently returned their responses by mail (Parker, 1992).

To increase survey response rates, some researchers suggest using mixed-mode surveys, such as combining web and mail modes, to provide respondents with more response options (Dillman, 2000; Dillman et al., 2001; Groves et al., 2004; Schaefer & Dillman, 1998; Shettle & Mooney, 1999). Unfortunately, there is no evidence to support that using mail and web surveys simultaneously (e.g., permitting mode self-selection) produces any overall increase in response rates (Dillman et al., 1994; Quigley et al., 2000). Rather, it results in minimal use of the web mode (Schonlau et al., 2002) or even reduced overall response rate (Griffin, Fischer, & Morgan, 2001). Dillman et al. (1994) observed no response rate improvements when respondents to the 1990 census short form were offered either a mail-only mode (71% response rate) or a mail and interview mode with mode self-selection (69% response rate). Switching modes in follow-up contacts, however, has been shown to improve response rates (Dillman, Dillman, & Makela, 1984; Paxson, Dillman, & Tarnai 1995; Schonlau et al., 2002; Shettle & Mooney, 1999). Shettle and Mooney (1999) suggest that it is better to use a sequential rather than concurrent mixed-mode strategy, such that participants are initially contacted in one mode, with follow-ups to nonrespondents made in other modes. Their national survey of college graduates with a 68% response rate after mail contacts, increased to 81% after telephone

interviews were offered, and then increased to 88% after in-person interviews were offered.

A recent meta-analysis of 43 mail and web mixed-mode studies with mode self-selection revealed that response rates were higher in mail than in web modes, and respondents were inclined to select the mode by which they were initially contacted (Shih & Fan, 2007b). Among the 43 studies, the unweighted average mail response rate of 27% exceeded the web response rate of 19% by 8%. When respondents received a mail survey as their first contact with the option to complete a web survey, response rate for the mail survey was 16% greater than for the web survey. Alternatively, when respondents received a web survey as their first contact with the option to complete a mail survey, the response rate was 29% greater for the web survey compared to the mail survey (Shih & Fan, 2007b).

The current study used a mail and web mixed-mode design with a mail survey as the initial contact. The population of school counselors was not known to have any exceptional familiarity with technology and the Internet. Thus, it was expected that there would be more mail than web respondents.

Survey Nonresponse. The survey nonresponse rate is a measure of the number of respondents who did not participate in a survey divided by the total number of participants invited to participate (Fraenkel & Wallen, 2006). Survey nonresponse can result when participants refuse to participate (e.g., lack of time, interest, or knowledge; unwillingness to be surveyed), are unable to participate (e.g., scheduling conflicts, illness, disability, illiteracy), or cannot be reached (e.g., incorrect address or telephone number, not home) (Fraenkel & Wallen, 2007).

Factors that may reduce survey nonresponse include establishing (or already having) a relationship between respondents and a sponsoring organization, a respondent's personal interest in the survey topic, and a plain instead of a fancy web survey layout (Dillman et al., 1998), as well as timeliness of the topic (Dillman, 2000). In a meta-analysis of mail surveys, Yammarino et al. (1991) found that respondents also expect postage to be provided and its absence may deter a response. Other ways to reduce survey nonresponse include assuring confidentiality and anonymity, using appropriately designed questionnaires and items, providing postage for mail surveys, starting with easy and nonthreatening questions, using call-backs, mailing/emailing reminders and replacement surveys, and offering incentives (Fraenkel & Wallen, 2006). Surveys with government sponsorships have been shown to produce higher response rates than surveys without such sponsorships (Dillman, 2000; Dillman, Singer, Clark, & Treat, 1996; Heberlein & Baumgartner, 1978), possibly due to an "appealing to authority" effect (Groves, Cialdini, & Couper, 1992).

Shifts in society's willingness to participate in surveys may be related to growing concerns about privacy (Goree & Marzalek, 1995), confidentiality, telemarketing, and trust (Babbie, 2007; Singer, 2003; Singer, Mathiowetz, & Couper, 1993), as well as respondent's interest in the subject matter (Kawasaki & Raven, 1995). Singer (2003) notes that 13% of respondents who were willing to participate in her survey were unwilling to sign the consent form. Individuals are especially concerned about computerized data collection methodologies (Glasner, 1999; Martin & Nagao, 1989; Rosenfeld & Booth-Kewley, 1996). Americans are investing in ways to protect their identities, screen callers (Link & Oldendick, 1999), and restrict visitors (Blakely &

Snyder, 1997). Over eight million American's live in gated communities and almost 40% of new residential developments are gated (Blakely & Snyder, 1997).

One of the most important factors in decreasing survey nonresponse may be the number and type of contacts. A meta-analysis of web surveys suggests that follow-up contacts with nonrespondents, personalized contacts, and pre-notification are dominant factors influencing response rates (Cook, Heath, & Thompson, 2000). For email surveys, one, two and three contacts with respondents produced 29%, 41% and 57% response rates respectively (Schaefer & Dillman, 1998). Fowler (1993) warns that surveys that don't include follow-up procedures have lower response rates. Dillman (2000) suggests the following to improve response rates: 1) provide a respondent-friendly questionnaire; 2) provide four first-class mail contacts plus a "special" contact; 3) provide return envelopes with first class stamps (i.e., not business reply envelopes); 4) personalize correspondence; and 5) provide financial incentives (pp. 150-153). Researchers should also obtain as much demographic information as possible on sampling frame participants to permit an examination of sample representativeness.

In the current study, attention was devoted to providing a respondent-friendly questionnaire that included funder and sponsor logos, researcher contact information, and the respondent's name and school; the initial mailing was followed with four first-class reminders; and postage-paid return envelopes were provided (business reply envelopes were used because it was not practical to use "real" stamps).

Early and Late Responders

"Early responders" refers to survey participants who respond to an initial request to participate in a survey, while "late responders" refers to those who participate only after one or more reminders (Bostick et al., 1992). Studies have reported few or no

differences between early and late responders in demographics (Bostick et al., 1992; Fraze, 1986; Gillispie, 1997; Goudy, 1976; Irani et al., 2004; Sobal & Ferentz, 1989) and substantive questions (Bostick et al., 1992; Goudy, 1976; Sobal & Ferentz, 1989), while others have reported differences in demographics (Dallosso et al., 2003) and response quality (Bostick et al., 1992).

Regarding demographics, Gillispie's (1997) study among 172 (59% response rate) randomly selected business faculty at four North Carolina universities examined the use and perceived value of computer-mediated communication for instructional purposes. Results revealed no differences among early and late responders by gender, job title, highest degree, age and teaching experience (Gillispie, 1997). Fraze (1986) also compared demographics by response wave but found one significant difference. This study among 653 Future Farmers of America (FFA) participants explored the relationship between FFA participation in high school, and career choice and job satisfaction after graduating. Following cluster random sampling, the survey response rate was 44% (n = 290), 165 early responders and 125 late responders. Analyses using t-tests revealed a statistically significant difference between early and late responders for high school grade point average, but not for educational level, FFA offices held, judging contest participation, leadership contest participation, career choice, or job satisfaction. Early responders had higher high school grade point averages than late responders, $p < 0.05$ (pp. 34-35).

Another study of high school graduates found that early responders have higher socioeconomic status than late responders (Pavalko & Lutterman, 1973). This study conducted a mail survey among 10,321 parents of Wisconsin high school graduates soliciting data on their child's educational and occupational activities following

graduation. The response rate was 91% after the initial mailing and three reminders. Four response waves were compared, one corresponding to each mailing. Results revealed that the parents of children with higher socioeconomic status (as measured by their child's high school rank, intelligence, educational plans, educational and occupational attainment) were 20% more likely to respond during the first response wave (Pavalko & Lutterman, 1973). Another study examining demographics was conducted among 35,131 randomly selected participants (63.5% response rate). In this nationwide mail survey about urinary health, results revealed that late responders were less likely to be women (OR 0.88, 95% CI 0.81–0.96) and younger (OR 0.99, 95% CI 0.98–0.99), but more likely to be South Asian than Caucasian (OR 1.92, 95% CI 1.66–2.22) (Dallosso et al., 2003).

Combining demographics and response quality, Sobal and Ferentz (1989) conducted a national mail survey among 1,010 physicians to examine differences in demographics, substantive questions, and response quality among the first and second mailings. Results after an 82% return rate revealed no differences by response wave in demographics (age, gender, type of residency, or region of the country), substantive questions regarding respondents' residency, use of "don't know" responses, or item nonresponse. They concluded that responses to the second mailing did not change the sample's representativeness or the study's substantive results (Sobal & Ferentz, 1989). Bostick et al. (1992) conducted a 20-minute telephone survey about risk factors for cardiovascular disease among 241 randomly sampled physicians from the upper Midwest states, 172 early responders and 69 late responders. Findings revealed no significant differences in demographics (e.g., gender, year of graduation from medical school, field of practice, percent of time devoted to primary care, average number of patients seen daily, and city size) or study variables, but a significant difference was revealed in social

desirability responding, $p = 0.03$. Early responders provided more socially desirable responses than late responders (Bostick et al., 1992).

The current study sought to examine the effect of response wave on demographics and response quality at two data collection cycles. Wave 1 comprised the initial mailing and first three reminders and Wave 2 comprised only the fourth reminder. The decision was made to split the response waves in this manner to examine the effect of extending a survey's data collection into a new school year. Additionally, splitting in this manner permitted a comparison among two data cycles lasting the same number of months. The first response wave occurred during the first three months of data collection (April – July 2005) and the second response wave occurred during the last three months (September – December 2005). No reminders were sent in the time between the two response waves.

Survey Research Modes

Self-Administered Versus Interview Surveys

Researchers generally categorize surveys into two types based on their data collection methods: interviews and self-administered questionnaires (Babbie, 2007; Fink, 2006). Interviews are conducted face-to-face or via telephone or teleconference wherein the respondent communicates personally with an interviewer. Self-administered surveys include mail, email and web surveys in which respondents read item questions or statements on their own and provide their own written responses. Interview-based surveys have additional costs and considerations over other self-administered modes such as training and paying interviewers, interviewer safety, and telephone and transportation expenses (Babbie, 1990; Fink, 2006). Unlike self-administered surveys where respondents provide their own responses, interviews use interviewers to gather and record data from respondents. Thus, it is essential that interviewers are neutral, that they use

consistent questioning and probing (eliciting clarification for incomplete or vague responses) methods, that they record responses accurately, and that their presence has no effect on a respondent's responses (Babbie, 2007). Telephone surveys can be less expensive than face-to-face interviews and can be automated permitting more control over data collection (Babbie, 2007; Fraenkel & Wallen, 2006). Computer-aided telephone interviewing (CATI), computer-aided personal interviewing (CAPI), and random digit dialing are some of these technological advances.

The advantages of interviews over self-administered surveys include fewer incomplete questionnaires, fewer misunderstood items and responses, higher response rates, and greater sampling flexibility (Babbie, 2007). Response rates in telephone surveys in general, however, are declining, possibly due to growth in telemarketing (Babbie, 2007). The advantages of telephone interviews over face-to-face interviews include less cost and time, greater safety for the interviewer, and the interviewer has fewer effects on respondent's responses (Babbie, 2007).

Self-administered surveys such as direct administration to a group, mail, web, and email (no studies were found that administered surveys via cell phones) are those that respondents complete by hand or by computer on their own. Such surveys are typically disseminated to respondents via the mail, facsimile, personal delivery, publications, group meetings, email or the Internet. In surveys directly administered to groups (such as during a meeting), a researcher has access to all participants at the same time and in the same place. In a mail survey, a paper survey is mailed directly to a respondent and then mailed back to the researcher by the respondent. Among the advantages of mail surveys are that they can be used to reach participants that are difficult to reach by telephone or face-to-face, respondents can complete them at their leisure, and respondents can to take

sufficient time to provide thoughtful responses (Fraenkel & Wallen, 2006). Among their disadvantages, they require respondents who are literate, there is no opportunity for building rapport (as in interviewing), and there is no (or limited) opportunity for a researcher to clarify vague or incomplete responses. Both email and web surveys are disseminated and returned electronically via the Internet.

Self-administered surveys (excluding surveys directly administered to a group) typically have lower response rates than interviews and require a series of follow-up reminder contacts and replacement questionnaires (Babbie, 2007). Thus, Babbie (2007) suggests that users monitor daily and cumulative return rates throughout the data collection cycle. Self-administered surveys that are directly administered to a group, however, have among the highest response rates (Fraenkel & Wallen, 2006). Advantages of self-administered surveys over interviews are cost, speed, lack of interviewer bias, and increased privacy (Babbie, 2007). Although web surveys are less expensive to conduct than mail surveys, they are less representative of the population than mail surveys (Babbie, 2007).

Survey Mode Effects

Social science researchers note that questionnaire design, target population, respondent demographics, data quality and data types may be influenced by the mode by which survey data are gathered (Babbie, 2007; Dillman, 2000; Tourangeau, 2004; Tourangeau et al., 2000). Respondents provide different responses to identical items in different survey modes due to a respondent's perception of a mode's degree of privacy, legitimacy, and cognitive burden (Tourangeau, 2004; Tourangeau et al., 2000). For example, telephone interviews are perceived to be less private than computer assisted modes, long questions or response option lists may overburden a respondent's memory,

the interview may be rushed (Tourangeau, 2004; Tourangeau et al., 2000), or respondents may confuse legitimate telephone surveys with telemarketing (van Leeuwen & de Leeuw, 1999). Dillman (2000) describes a framework for administering effective mail and Internet surveys that has been used successfully for over 25 years. This framework, called the "Tailored Design Method" describes a survey as a social interaction between a researcher and a respondent and stresses the importance of effectively communicating the survey to the respondent (Dillman, 2000).

Electronic surveys, including both email and web surveys, have important advantages over other traditional survey modes such as lower costs, resources, dissemination time, and response time (Kiesler & Sproull, 1986; Opperman, 1995; Parker, 1992; Schaefer & Dillman, 1998; Schmidt, 1997; Schuldt & Totten, 1994; Shannon & Bradshaw, 2002; Smith, 1997; Weible & Wallace, 1998), and possibly decreased response bias (Martin & Nagao, 1989; Mazzeo & Harvey, 1988). Compared to email surveys, web surveys offer additional benefits including broader stimuli potential (color, audio, video, animation, graphics, 3D), automated piping and error-checking features (versing, complex branching, skips, pop-up messages, and features to standardize responses), and automated electronic data collection, entry and analysis (Dillman, 2000; Tourangeau, 2004; Weible & Wallace, 1998).

Given their benefits, web surveys also provide important challenges for researchers as compared to other survey modes, including sampling issues, lower response rates, lower response consistency, and technical issues. Specific concerns involve whether web respondents are representative of the target population, whether web and mail responders have similar demographics, whether web and mail surveys produce responses of similar quality, and whether survey data gathered via multiple modes can be

aggregated (Dillman, 2000; Schonlau et al., 2002). Web survey use, especially commercial use, has continued to explode despite coverage and nonresponse issues (Couper, 2000), as society strives to find cheaper, faster ways to collect data (Tourangeau, 2004).

Mixed-Mode Mail and Web Surveys

Researchers suggest that it may be best to study web surveys by comparing them to other survey modes such as mail, email, and telephone surveys (Dillman, 2000; Kiesler & Sproull, 1986; Schaefer & Dillman, 1998). Mixed-mode designs are expected to reduce the limitations of individual survey modes, reduce overall costs, and improve overall response rates (Dillman, 2000; Schaefer & Dillman, 1998). Schnolau, Fricker, and Elliot (2002) also suggest using mixed mode surveys to increase coverage when conducting web surveys among general populations for which email addresses are not available. Groves and Kahn (1979) observed evidence of respondent mode preferences in their national telephone interview in which 39% of respondents said they favored a telephone interview, 23% preferred a face-to-face interview, and 28% preferred mail.

The use of mixed-mode surveys, however, raises the issue of whether respondents using different modes provide the same answers and represent the same populations (Dillman et al., 2001). This study will contribute important and timely information concerning differences in the demographic characteristics of respondents and response quality among web and mail survey modes.

Respondent Demographics

Obtaining a representative sample for an electronic survey is an especially important concern (Dillman, 2000; Schaefer & Dillman, 1998; Swoboda et al., 1997; Tse, 1998) because individuals in the general population have unequal access to email and the

Internet (Dillman, 2000). Tse (1998) notes that while almost everyone has a postal address, email surveys are restricted to those with email access. Email respondents tend to over represent the middle and upper classes (GVUC, 1999; Mehta & Sividas, 1995). Sheehan and Hoy's sample of email survey respondents from an Internet population revealed 60% had at least a bachelor's degree, and 86% checked their email at least once per day (2000). Some studies suggest that most web survey respondents have some college experience, are Caucasian, live in suburban areas, access the Internet daily from home, have an average income of $57,300, and are 38 years old (GVUC, 1999). Pitkow and Kehoe (1996) note that most web survey respondents are in education and computer-related fields, have a college or advanced degree, and have more wealth than the majority of the population. Researchers caution against generalizing findings to the population at large that are based on Internet newsgroups and other restricted sampling frames (Bachmann et al., 1996; Swoboda et. al., 1997). There are also potential sources of sampling bias within the Internet population associated with differences in Internet connectivity, equipment, browser software, and experience with the Internet (GVUC, 1999).

The current study will compare the gender, ethnicity, age, and professional employment demographics of mail and web survey respondents. All respondents in the current study are assumed to have Internet access; however, it's expected that there may be some differences in demographic characteristics by survey mode or response wave.

Gender

Gender distributions for surveys in general suggest that females may respond more often than males, regardless of the survey mode (Borkan, 2006; Dillman et al., 2001; Fiala, 2004; Fritz, 2004; Green & Stager, 1986; Jun, 2005; Smith, 1983;

Underwood et al., 2000). This trend is also reflected in surveys involving school counselors in particular (Berry, 2006; Fitch & Marshall, 2004; Fritz, 2004; Ruebensaal, 2006; Young, 2004). In a statewide mail survey of 102 systematically sampled full-time Illinois secondary school counselors, Fritz (2004) reported an unadjusted response rate of 29.25%, comprised of 76% females and 24% males.

There is less consistency in the gender distributions among mail and electronic surveys. Among electronic surveys, some studies report more males than females (GVUC, 1999; Schmidt, 1997; Sheehan & Hoy, 2000), while others report more females than males (Ayers, 2004; Borkan, 2006; McCabe et al., 2002; Witte et al., 2000). A study by Ayers (2004) among elementary music teachers examined gender effects on mail and web surveys with mode self-selection. Participants, invited via mail, were directed to either access a web survey online or request to have a paper survey mailed to them (only seven requests for paper surveys were received). Ayers (2004) reported a response rate of 18.60% (n = 412), comprised of 86.90% (n = 358) females and 13.10% (n = 54) males.

Kiesler and Sproull (1986) note that while there were more males than females in their randomly-sampled study of 151 university students and faculty/staff, "…gender…did not affect response rates" (p. 408). In mail and web surveys among college students, two studies observed more females than males in both mail and web modes because so many more females responded (McCabe et al., 2002; Underwood et al., 2000). A similar finding was reported by Borkan (2006) in a randomized mail and web survey of 2,000 Ohio middle and high school teachers. Borkan (2006) noted that 73.86% (n = 80,023) of the participants in the target population were female and approximately 60% of the respondents in the overall sample as well as in each condition were female; however, the gender effects by survey mode were not statistically significant. In a study of

151 randomly selected student and faculty email users, Kiesler and Sproull (1986) observed that females wrote longer responses to open-ended items than males, but found no gender by survey mode interaction. Another study by Hayslett and Wildemuth (2004) among 300 academic references librarians observed a 72% response rate for females, but differences by mail and web modes were not significant, $p \leq 0.05$.

Ethnicity

Many studies suggest that more Caucasians than other ethnic groups respond to surveys regardless of the mode (GVUC, 1999; McCabe et al., 2002), but especially for web surveys (Witte et al., 2000). In a comparison of web and paper/mail surveys collecting alcohol and drug use data among a sample of 3,606 randomly selected and randomly assigned university students, McCabe et al. (2002) observed more Caucasians (68%) than all other ethnic groups combined in the overall sample, $p < 0.001$, as well as for the mail, $p < 0.01$, and web surveys, $p < 0.001$, separately. A nationwide web survey using a stratified random sample among 1,201 school counselors produced a response rate of 19% ($n = 231$), comprised of 87% females and 88% Caucasians (2% African-American, 1% American Indian, 1% Asian, and 5% Hispanic) (Berry, 2006). In contrast, Smith & Leigh's (1997) study about sexual fantasies among undergraduate students observed no differences in ethnicity.

Age

Age distributions for surveys seem to suggest that web survey respondents may be of the same age as mail respondents (Hayslett & Wildemuth, 2004), or younger than mail respondents (Kaufman et al., 1997; Palmquist & Stueve, 1996; Schmidt, 1997; Zhang, 2000). In their study of lesbians, gays and bisexuals regarding therapist selection, Kaufman et al. (1997) observed that electronic respondents were more disclosing of their

sexual preferences, more educated, had higher incomes, and were younger than mail respondents. Schmidt (1997) observed that web respondents were younger and male with higher socioeconomic status and education. Hayslett and Wildemuth's (2004) study among 300 reference librarians observed no age differences between mail and web modes and 50% of respondents were 45-54 years of age. No differences were observed in undergraduate students' age, marital status, ethnicity or education between web (n = 72) and paper (n = 56) modes in Smith and Leigh's (1997) survey about sexual fantasies.

Professional Experience

Very few studies of professional experience effects by survey mode were found in the literature. In studies of American urologists, fewer years of physician practice and clinical experience were observed among Internet respondents as compared to mail respondents (Kim et al., 2000; Hollowell et al., 2000). Hayslett and Wildemuth's study among 300 academic reference librarians reported that 92% of respondents had a Master of Library Science degree and 71% had worked in libraries for 10 or more years.

Response Quality

Response quality refers to the extent to which survey responses contribute accurate and informative data to a study (Dillman, 2000). The quality of responses is important in every survey mode because important decisions are made based on the data surveys provide. Interviews are believed to have comparatively lower item nonresponse and higher social desirability responding that self-administered modes (Sudman et al., 1996). Given the greater anonymity of electronic surveys, electronic survey respondents give less socially desirable responses (Kiesler & Sproull, 1986), possibly because people tend to be less inhibited and more self-absorbed when communicating with a computer (Kiesler, Siegel, & McGuire, 1984).Given the similarities between web and mail surveys

(e.g., visual stimulus, under respondent's complete control, items are read and then responses are written), Dillman (2000) notes that web responses are more similar to mail responses than to interviews.

With the rise in the use of web surveys in addition to or in place of mail surveys, it is important to understand response quality both within and between these modes. Although mail and web surveys share some features such as self-administration and providing written responses (e.g., handwritten or via a keyboard), there may be important differences in the quality of the data that each produces. Kiesler and Sproull (1986) note considerable similarity in response quality between paper and electronic modes, but not enough to consider them interchangeable. Some studies suggest that there are no differences in response quality between mail and electronic modes (Matz, 1999; Mehta & Sividas, 1995; Tse et al., 1995; Weible & Wallace, 1998; Yun & Trumbo, 2000), and no differences between mail and web modes in particular (Dillman et al., 2001; Hancock & Flowers, 2001; Saphore, 1999; Yun & Trumbo, 2000). Other studies have observed differences (Perkins & Yuan, 2001), suggesting that web surveys have better response quality than mail surveys (Weible & Wallace, 1998).

Findings regarding mail and web response quality are inconclusive and difficult to interpret. One of the reasons for this is that there are differences in the way response quality is defined and measured. Under the construct "response quality," some studies are actually only measuring the length of qualitative responses and item nonresponse, some just study response errors, and others focus on social desirability responding. Wu's (1997) measures of data quality included question completion rate, comments completion rate, and "average comments wording rate." Kiesler and Sproull's (1986) study of response quality included item nonresponse, not following instructions, social desirability, yea-

saying (selecting positive responses), item response length, and item self-disclosure. In the current study, response quality measures include pronoun use, item nonresponse, the use of extreme responses, yea-saying, item completion errors, the use of multiple responses, response length, and response equivalency.

Pronoun Use

Pronoun use is measured by the number of pronouns such as "I" and "We" that occur in a response to an open-ended item. This measure is typically found in the literature in studies involving social desirability effects (Kiesler & Sproull, 1986). Researching social desirability effects is beyond the scope of the current study; however, differences between the number of pronouns among web and mail responses to open-ended questions was examined. In Kiesler and Sproull's (1986) study of pronoun use, they counted the number of personal pronouns in three open-ended items. The items solicited respondents' responses regarding their most recent illness, personal habits that are bothersome, and things that elicit personal pride and satisfaction. Their analyses revealed no differences by survey mode among 151 university students and faculty/staff (Kiesler & Sproull, 1986). In the current study, pronoun use was measured by counting the number of personal pronouns in open-ended responses and then analyzed by survey mode and response wave using ANOVAs.

Item Nonresponse

Item nonresponse, one of the most commonly studied response quality characteristics (Pettit, 2002), is a measure of the number of items on a survey questionnaire that were skipped but should have been answered. Pettit (2002) provides the following operational definition: "the total number of items for which no response was provided" (p. 52). Item nonresponse can occur when a respondent doesn't understand

an item or an instruction for completing an item; an item is embarrassing, irrelevant, vague, too complex, or too personal; the respondent doesn't correctly follow branching instructions; the most appropriate response is not among those provided in forced-choice items (e.g., categories are not exhaustive); or an interviewer fails to record a response (Fraenkel & Wallen, 2006). Additionally, at the data entry stage, a data entry clerk may fail to record a respondent's response or a response may not get recorded because it is invalid or illegible (Fraenkel & Wallen, 2006). Suggestions to reduce item nonresponse include designing appropriate items; reducing questionnaire or interview length; eliminating items that are leading, biased, threatening, or complex; providing exhaustive categories for forced-choice items; and pre-testing the questionnaire (Fraenkel & Wallen, 2006). Low item nonresponse is an indicator of good survey response quality (Couper, Blair, & Triplett, 1999; Schaefer & Dillman, 1998; Stanton, 1998).

In studies comparing mail and electronic surveys, some studies reported higher item nonresponse among mail surveys (Kiesler & Sproull, 1986) while others reported higher item nonresponse in electronic surveys (Howes & Mailloux, 2001; Mehta & Sividas, 1995; Paolo et al., 2000; Webster & Compeau, 1996). Two studies observed no differences among mail and email surveys (Tse, 1998; Tse et al., 1995). Locke & Gilbert (1995) observed no item nonresponse differences in a study of psychological assessment, self-disclosure, and experiential differences using computer, paper, and interview modes. Kiesler and Sproull's (1986) study among 151 university students and faculty/staff noted that 22% of mail respondents compared to 10% of electronic survey respondents had one or more skipped items. Comparing web and mail surveys, web surveys have been shown to have the same (Pealer, 1999) or lower item nonresponse than mail surveys (Kiesler & Sproull, 1986; MacElroy et al., 2002; Schaefer & Dillman, 1998; Stanton, 1998; Truell et

al., 2002); however, higher item nonresponse in web surveys has also been reported (Ahlstrom, 2004; Smee & Brennan, 2000; Jun 2005). For example, Jun (2005) observed 21.44 times more skipped items in web than in mail surveys. Several studies observed no differences in mail and web item nonresponse (Cobanoglu et al., 2001; Matz, 1999; Pettit, 2002). Schaefer and Dillman (1998) provide a review of studies that found conflicting results.

Unlike mail surveys, web surveys can be programmed so that branching, error checking, and complex skip patterns occur automatically and pop-up windows can provide immediate feedback allowing respondents to fix incorrect or skipped responses before their survey is submitted (Schaefer & Dillman, 1998; Tourangeau, 2004). Features such as these are believed to increase a respondent's attention to survey items, producing lower item nonresponse in web surveys compared to other modes. On the other hand, they may annoy and overburden respondents, increasing item nonresponse and survey abandonment (Dillman, 2000; Dillman et al., 1998; Smee & Brennan, 2000).

To provide some clarification of the effects of automated features on item nonresponse in web surveys, a study conducted by Smee and Brennan (2000) examined mode effects using a 50-item questionnaire in five formats: mail, email, a single continuous web survey with no error checking, a multiple-page web survey with automated branching and no error checking, and a multiple-page web survey with automated branching and error checking. Results revealed that item nonresponse in all three web modes exceeded mail and email modes, with the highest item nonresponse occurring in the web mode with automated branching and error checking (the email response rate was too low to provide a valid comparison). They concluded that the use of web surveys with multiple pages compared to a single page will likely increase the

number partially completed web surveys, especially if error checking is used (Smee & Brennan, 2000). Reducing item nonresponse is best achieved by improving item design rather than by forcing respondents to fix their responses (Dillman, 2000; Smee & Brennan, 2000).

Item Completion Error

Item completion error is a measure of the number of errors on a survey questionnaire and happens when a respondent provides an invalid response (e.g., a response where one is not expected, a response that cannot be coded, illegible handwriting) (Pettit, 2002). Pettit (2002), using the term "response error" instead of item completion error, used the following operational definition:

> The total number of items for which (1) two or more options were selected, (2) it was not obvious which option was finally selected, (3) the response was illegible, (4) the response was inappropriate or impossible, or (5) a demographic combination was unlikely. (p. 52)

Sometimes this is the result of a branching or data entry instruction that was not understood or followed correctly (Dillman, 2000). General suggestions to reduce item completion errors in surveys, regardless of mode include providing concise instructions, using appropriately designed contingency items, and field-testing the survey questionnaire (Babbie, 2007; Dillman, 2000; Fraenkel & Wallen, 2006). Suggestions to reduce item completion errors in web surveys, in particular, are similar to those used to reduce item nonresponse in surveys: automated branching and error checking (Schaefer & Dillman, 1998; Tourangeau, 2004).

The literature is inconsistent, with some studies reporting no difference in item completion errors among mail and web surveys (Pealer, 1999; Smee & Brennan, 2000),

and others reporting fewer item completion errors in web compared to mail surveys (Weible & Wallace, 1998; Pettit, 2002). Smee and Brennan (2000) found no differences in their comparison of mail, email, and web modes. Kiesler and Sproull's (1986) health-related survey among 151 university students and faculty/staff reported fewer item completion errors in the email as compared to the mail survey. Of 53 items containing response errors, 5.3% were made by mail respondents and 0.0% was made by email respondents (Kiesler & Sproull, 1986).

In the current study, item completion error was examined among items in which a respondent provided an answer where one was not expected based on the respondent's response to a prior contingency-type item. This definition most closely relates to the fourth part of Pettit's (2002) operational definition, referring to responses that are inappropriate or impossible. The first part of Pettit's (2002) operational definition, where two or more responses are selected, was examined in the current study using the "multiple response use" response quality variable. Other ways to measure item completion error were beyond the scope of the current study.

Response Length

Response length is a measure of the number of words in a respondent's response to an open-ended item. It is generally assumed that a longer response written to an open-ended item is indicative of better response quality because respondents provide more data (Schaefer & Dillman, 1998). Email surveys have been shown to produce longer responses to open-ended items than mail surveys (Paolo et al., 2000). Several studies have observed that web surveys surpass paper/mail surveys in producing higher quality, more sophisticated, and longer responses to open-ended items (Kiesler & Sproull, 1986; MacElroy et al., 2002; Nicholls et al., 1997; Schaefer & Dillman, 1998; Wu, 1997). In a

web and mail survey involving mode self-selection (n = 1,228), a mean of 48.2 words was revealed for the web mode compared to a mean of 32.0 words for the mail mode for a "Use this space to add some final thoughts" open-ended item (MacElroy et al., 2002).

Yea-Saying

Yea-saying is the tendency of a respondent to agree with item statements or questions independent of the item's content (Greenleaf, 1992) as evidenced by a response that is located near or at the affirmative anchor of a list of Likert-type response options (Kiesler & Sproull, 1986). A study of yea-saying revealed no differences between telephone, mail and web surveys (Weijters et al., 2004). In a study conducted by Kiesler and Sproull (1986) comparing paper and electronic surveys, yea-saying was a measure of respondents' use of the affirmative side of a seven-point attitudinal scale and response extremity was a measure of their tendency to avoid extreme responses on the same scale (e.g., prefer the scale's midpoint). Yea-saying and response extremity were measured among 151 randomly-selected university students and faculty/staff using five forced-choice items. The items solicited participants' attitudes on health-related topics using a seven-point Likert response set where "Agree" equals one and "Disagree" equals seven. ANOVAs revealed no differences in yea-saying and no differences in response extremity by survey mode (Kiesler & Sproull, 1986).

The current study sought to expand the measurement of yea-saying in the literature by analyzing a dichotomous yes-no response scale instead of the seven-point Likert scale used by Kiesler and Sproull (1986). Yea-saying was thus examined by counting the number of yes responses and analyzing differences by survey mode and response wave using ANOVAs.

Response Extremity

Response extremity occurs when a respondent favors (or avoids) the extreme anchors (e.g., "strongly agree" or "strongly disagree" in a Likert scale) of a response scale (Greenleaf, 1992; Kiesler & Sproull, 1986; Naemi, 2006; Pettit, 2002). There is considerable variation in the way response extremity is measured in the literature (Naemi, 2006). Some studies measure response extremity by counting use of both extreme anchors in Likert-type response sets (e.g., "definitely disagree" and "definitely agree") (Berg & Collier, 1953; Booth-Kewley et al., 1992; Greenleaf, 1992; Pettit, 2002; Soueif, 1958; Sproull, 1986). For this type of measurement, Pettit (2002) provides the following operational definition: "the percentage of answered items for which either *strongly agree* or *strongly disagree* was selected" (p. 52). Some studies measure response extremity by counting use of only the most extreme positive response option (Brengelmann, 1960), while others use standard deviations (Hamilton, 1968).

A study using a community satisfaction questionnaire in telephone and mail survey modes revealed that telephone respondents used extreme responses more than mail respondents, but telephone respondents following the interview with a paper survey in hand preferred the middle response options (Tarnai & Dillman, 1992). They concluded that middle categories were favored in surveys using a visual format (Tarnai & Dillman, 1992). Dillman et al. (2001) supported this conclusion in a study among 8,999 participants in a mixed-mode (e.g., telephone, IVR, mail, and web) survey about long distance telephone services. They analyzed items containing five-point Likert-type response options (e.g., "Not at all satisfied" to "Extremely satisfied"), although how they measured response extremity is not clear. They observed that telephone respondents used extreme responses more than web respondents, but there was no difference among mail

and web respondents (Dillman et al., 2001). Helgeson and Ursic (1989) observed no differences between paper and electronic surveys in a sample of undergraduate students. Pettit (2002) observed no differences between web and paper modes in a comparison of personality questionnaires. Booth-Kewley et al.'s (1992) study among 246 Navy recruits also reported no differences between a computer survey with backtracking (e.g., respondents could return to previous pages and change their responses), a computer survey with no backtracking, and a paper survey. In contrast, Sproull's (1986) survey among 60 business professionals in a *Fortune 500* company reported more extreme responding in email than in paper surveys. This study examined 48 hypothetical task items with response anchors scaled from zero to 10 where zero and 10 were coded as extreme responses (Sproull, 1986).

The current study sought to expand the measurement of response extremity to include a four-point percentage-based interval scale using the most extreme positive response as suggested by Brengelmann (1960). Response extremity was thus measured by counting the number of "76-100%" responses in items containing percent scaled responses (e.g., 1-25%, 26-50%, 51-75%, and 76-100%) and then analyzed by survey mode and response wave using ANOVAs.

Response Equivalency

Response equivalency is a measure of differences in the mean scores among items or collapsed item groups having ordinal, interval or ratio level data. Comparing these mean scores across survey modes permits a researcher to analyze whether respondents answer differently by mode. Researchers suggest that responses across surveys modes in general are not equivalent (Dillman, 2000; Sudman et al., 1996) due to differential effects on responses resulting from each mode's degree of impersonality, perception of

legitimacy, and level of cognitive burden imposed on the respondent (Tourangeau et al., 2000, p. 20).

One study comparing paper and email observed a difference in response equivalency (Miller et al., 1996), but most mail and electronic survey studies reported no differences (Bachmann et al., 1996; Booth-Kewley et al., 1992; Hayslett and Wildemuth, 2004; Helgeson & Ursic, 1989; Mehta & Sividas, 1995; Pettit, 2002). In a study comparing personality questionnaires in web and paper modes, Pettit (2002) observed no differences in mean scale scores and no differences in internal consistency by survey mode. Helgesen and Ursic (1989) examined the equivalency of decision processes among 126 randomly assigned undergraduate business students via electronic and paper surveys. They observed no statistically significant differences in response equivalency and no item ordering effects by survey mode. They noted, however, that electronic responses were more stable than paper responses when the extremity of scalar anchors changed (Helgeson & Ursic, 1989). Booth-Kewley et al.'s (1992) study among 246 Navy recruits measured response equivalency by comparing the mean scores of items containing five-point Likert response sets (e.g., 1 = strongly agree, 5 = strongly disagree). They reported no difference in response equivalency between paper, computer with backtracking, and computer without backtracking surveys (Booth-Kewley et al., 1992).

Multiple Response Use and Anecdotal Comments

Hayslett and Wildemuth (2004) noted in their study among 300 academic references librarians that the use of check boxes in the mail survey versus radio buttons in the web survey produced a data entry problem in an item about primary work responsibilities. Only one response was expected for this item. In the web survey, the use of radio buttons prevented respondents from selecting more than one response option;

however, some mail survey respondents checked two or more responses on their mail surveys. Thus, researchers applied a rule to the mail survey responses to select which one among the multiple responses would be retained and which would be discarded (Hayslett & Wildemuth, 2004). No analysis was conducted on the discarded responses. Pettit's (2002) study comparing personality scales by paper and web modes provided the following operational definition of multiple response use: "The total number of items for which…two or more options were selected" (p. 52). Pettit (2002) analyzed multiple response use as one of five types of errors measured collectively as response errors (item completion errors), thus no findings for multiple response use alone were reported.

The current study sought to examine this phenomenon in greater detail. Similar to Hayslett and Wildemuth (2004), rules were applied in the current study to select which one among multiple responses to retain in instances where only one response was expected. A variable was then created to count the number of responses that would have otherwise been discarded. Since radio buttons used in the web survey prevented respondents from providing multiple responses where they weren't supposed to, this analysis could only be examined in the current study in the mail survey mode by response wave.

Hayslett and Wildemuth (2004) noted another problem in their study, the use of anecdotal comments by mail respondents but not by web respondents. They explained that some mail respondents wrote notes on their paper surveys regarding items they thought were ambiguous or didn't understand, to describe how they interpreted an item, and to clarify their responses. The web survey design, however, prevented web respondents from writing such comments. They suggested adding text boxes at key points throughout the web survey to capture anecdotal comments, but noted that web

respondents would still not be able to draw lines, circle portions of items, or write nontextual annotations as mail respondents could (Hayslett & Wildemuth, 2004).

The current study sought to examine this phenomenon in greater detail as well. A variable was created to record all textual anecdotal comments, and then analyzed for response length and pronoun use. Since web respondents in the current study were prevented by the web survey interface from writing anecdotal comments, this variable could only be analyzed in the mail survey mode by response wave.

CHAPTER III

METHODOLOGY

Chapter 3 presents the methodology used to answer the research questions in this study. It is arranged into the following nine sections: research design, using an existing dataset, research questions, variables, instrumentation, data collection, population and sampling, statistical analysis, and analysis of research questions.

Research Design

This study employed a nonexperimental, quantitative, cross-sectional survey research design to examine demographic characteristics and response quality among mail and web survey modes at two time periods. The sample was nonrandomly selected and nonrandomly assigned to groups. Respondents self-selected the survey administration mode and self-administered the survey. There was no control group. Respondents were divided into one of two survey modes (Mail or Web) and one of two data collection cycles (Wave 1 or Wave 2) comprising four groups (Mail1, Mail2, Web1, and Web2) with unequal sample sizes based on the survey mode each selected and the time period in which each responded. To distinguish each of the respondent group variables, the naming convention in Table 1 was employed. All respondents were instructed to complete their surveys based on the caseload of 6th-12th grade students they had during the 2004-05 academic school year.

Mail1 and Web1 respondents responded during the Spring 2005 data collection period, which occurred April through July 2005 at the end of the 2004-05 academic year. Mail1 respondents submitted mail surveys and Web1 respondents submitted web surveys accessed via the Internet. Mail2 and Web2 respondents responded during the Fall 2005 follow-up data collection period, which occurred September through December 2005 at

the beginning of the 2005-06 academic year. Mail2 respondents submitted mail surveys and Web2 respondents submitted web surveys accessed via the Internet. The fact that data collection occurred in two distinct cycles during two different school years permitted an examination of possible mode differences among early and late respondents. Table 2 shows the respondent group comparison combinations used in the analyses.

Table 1

Naming Convention for Survey Mode and Response Wave Response Condition Variables

Respondent Condition	Variable Name	Description
Survey Mode	Mail	All mail surveys returned during the Wave 1 and Wave 2 combined data collection cycles
	Web	All web surveys returned during the Wave 1 and Wave 2 combined data collection cycles
Response Wave	Wave 1	All mail and web surveys combined that were returned during the Wave 1 data collection cycle
	Wave 2	All mail and web surveys combined that were returned during the Wave 2 data collection cycle
Survey Mode x Response Wave	Mail1	Mail surveys returned during Wave 1
	Mail2	Mail surveys returned during Wave 2
	Web1	Web surveys returned during Wave 1
	Web2	Web surveys returned during Wave 2

Table 2

Respondent Group Comparison Combinations

Comparison Group	Design
Survey Mode	Mail vs. Web
Response Wave	Wave 1 vs. Wave 2
Mail by Response Wave	Mail1 vs. Mail2
Web by Response Wave	Web1 vs. Web2
Survey Mode at Wave 1	Mail1 vs. Web1
Survey Mode at Wave 2	Mail2 vs. Web2

Note. While interaction effects were analyzed to determine whether to examine main effects or simple effects, there were no research questions that specifically analyzed Mail1 vs. Web2 or Mail2 vs. Web1 conditions in this study.

Using an Existing Dataset

The current study used a dataset derived from a larger study (Kohler, Applegate, Bradley, Cai, & Bradshaw, 2007) that examined school counselor work settings, caseloads, career assessment and planning activities, and recruitment and support strategies for students with and without disabilities in nontraditional occupations. The larger study was approved by WMU's Human Subjects Institutional Review Board (HSIRB) in two parts: "Creating IT Career Pathways through High School Career and Technical Education Programs, Part 2" (HSIRB Project #05-03-20) and "Creating Career Connections for Students with Disabilities through Career and Technical Education Programs, Part 2" (HSIRB Project #05-03-21). Protocols for analyses of data for these two studies were approved by the WMU HSIRB as "Creating IT Career Pathways through High School Career and Technical Education Programs, Part 1" (HSIRB Project #03-05-23) and "Creating Career Connections for Students with Disabilities: A Longitudinal Study of Their Enrollment and Outcomes of Career and Technical Education, Part 1" (HSIRB Project #03-08-05), and by the University of Illinois' HSIRB as Cases #03232 and #03233, respectively. The University of Illinois' HSIRB, which also serves as the Illinois State Board of Education's HSIRB, approved release of participants' names to Kohler for the larger study.

The "Creating IT Career Pathways" and "Creating Career Connections" studies comprised a research partnership between WMU, the Illinois State Board of Education (ISBE), and Research-to-Practice Teams of business and practitioner stakeholders. The "Creating IT Career Pathways" study, funded by the National Science Foundation (grant #0306092), investigated factors influencing the enrollment, program concentration, and employment experiences of high school females in Career and Technical Education-

Information Technology (CTE-IT) programs in Illinois. The "Creating Career Connections" study, funded by the U.S. Department of Education Office of Special Education Programs (grant #H324C030014), explored factors influencing the enrollment, program concentration, and employment experiences of high school students with disabilities in Career and Technical Education (CTE) programs in Illinois. Both projects were based at WMU's Career Connections Resource Center and implemented collaboratively with ISBE.

In response to federal accountability mandates, each year ISBE collects data regarding student enrollment and performance in CTE programs throughout the state, as well as postsecondary education and employment data. Using these data collected by ISBE, the "Creating IT Career Pathways" study explored preparation for IT careers in the following areas: (a) school counselor and teacher support strategies to recruit and retain students in CTE-IT programs; (b) student and school characteristics that influence CTE-IT program enrollment, school-directed work experience, and program concentration; and (c) the influence of student and environmental characteristics and support strategies on post-secondary enrollment in IT education programs and employment. Using the same participants and data, the "Creating Career Connections" study explored the enrollment and outcomes of students with disabilities as compared to their peers without disabilities in CTE programs in Illinois across four dimensions: (a) career assessment; (b) enrollment; (c) outcomes; and (d) policy influences. In both projects, experiences of students with disabilities were compared with those of students without disabilities; experiences of students from various ethnicities and of different genders were also investigated.

As part of the larger study, surveys were conducted among CTE instructors and school guidance counselors working with students in grades 6 through 12 in public schools and CTE centers in Illinois during the 2004-2005 academic year. CTE instructors in the sample received a 29-item survey questionnaire in web and mail formats, and counselors received a 48-item survey questionnaire in web and mail formats. Participants were permitted the option to respond to their survey via mail or the web. The larger studies provided a means to examine the methodological issues of survey research by comparing web and mail survey modes. The data set from the larger studies was used in the current study to compare demographic characteristics and response quality among survey modes. Participants in the CTE survey portion of the study were excluded from the current study because the demographics of computer and technology instructors in that sample could potentially bias the results (Kaminer, 1997). Thus, the current study included only participants involved in the 48-item school counselor survey.

Given that the current study used an existing dataset from the larger study, all procedures leading to the creation of this dataset were conducted before the current study was initiated (e.g., instrument design, field testing, sampling, survey dissemination, data collection, and data entry); however, they are described in this study in detail so that analyses and results can be examined within the context of the entire study. The dataset used by the researcher in the current study was stripped of all identifying information (e.g., participant names, school names). All protocols in the current study were approved by Western Michigan University's Human Subject's Institutional Review Board under the "exempt" category of review on April 28, 2006 as HSIRB Project Number 06-04-24 (see Appendix A).

Research Questions

The following research questions were examined in this study:

1. Does a difference exist in demographic characteristics by survey mode or response wave?
    a) Does a difference exist in gender by survey mode or response wave?
    b) Does a difference exist in ethnicity by survey mode or response wave?
    c) Does a difference exist in age by survey mode or response wave?
    d) Does a difference exist in professional employment by survey mode or response wave?
2. Does a difference exist in response quality by survey mode or response wave?
    a) Does a difference exist in pronoun use by survey mode or response wave?
    b) Does a difference exist in pronoun use in anecdotal comments by response wave?
    c) Does a difference exist in item nonresponse by survey mode or response wave?
    d) Does a difference exist in response extremity by survey mode or response wave?
    e) Does a difference exist in yea-saying by survey mode or response wave?
    f) Does a difference exist in item completion errors by survey mode or response wave?
    g) Does a difference exist in response length by survey mode or response wave?

h) Does a difference exist in the response length of anecdotal comments by response wave?

i) Does a difference exist in response equivalency by survey mode or response wave?

j) Does a difference exist in multiple response use by response wave?

3. Do demographic characteristics and response quality predict survey mode or response wave?

a) Do demographic characteristics and response quality predict survey mode?

b) Do demographic characteristics and response quality predict response wave?

Variables

This study examined demographic and response quality variables by survey mode and response wave. Categorical demographic variables were *gender* with two levels (male, female) and *ethnicity* with seven levels (Black or African American, American Indian or Alaskan Native, Asian, White or Caucasian, Latino or Hispanic, Native Hawaiian or Other Pacific Islander, and Biracial or Multiracial). Continuous demographic variables were *age* and *professional employment*, each measured in years. Continuous response quality variables examined for all levels of survey mode and response wave were: *pronoun use, item nonresponse, response extremity, yea-saying, item completion errors, response length*, and *response equivalency*. Two additional continuous response quality variables, *anecdotal* and *multiple response use,* were analyzed only for Mail1 and Mail2 conditions because the web-based interface prevented them from occurring in the web survey. All response quality variables except response equivalency were count-type

variables in which values reflected a count of the total number of instances. Response equivalency, in contract, was measured as a mean. Response condition variables were *survey mode* (mail and web) and *response wave* (one and two). See Table 3 for variables and their constitutive and operational definitions as they apply to the current study.

Instrumentation

The survey instrument was a self-administered questionnaire taking approximately 30 minutes to complete and containing 48 items. Two parallel versions of the questionnaire were developed: a paper format that was mailed to respondents (see Appendix D) and a web format which respondents accessed via the Internet (see Appendix E). Efforts were made to keep the two versions as similar as possible to facilitate a comparison of web and mail survey modes. Participants received no incentive to participate, but were asked to provide their email addresses if they desired a report of the study's findings.

Content, Validity, and Reliability

Questionnaire items were developed from the following sources: 1) career counseling and student support strategies from the literature; 2) competencies suggested by the American School Counselor Association; and 3) data provided by the National Alliance for Partnerships in Equity (Kohler et al., 2007). Content sections were arranged as follows: 1) School counselor work setting and caseload (items 1-13); 2) Career assessment activities with students on caseload (items 14-28); 3) Career planning activities with students on caseload (items 29-31); 4) Recruitment and support for students in nontraditional occupations (items 32-40); and 5) Demographic information and open-ended comments (items 41-18). The survey's content validity was examined by content experts to determine the extent to which concepts in the survey correctly

Table 3

Definitions and Measurement Levels for All Study Variables

Variables	Constitutive Definitions	Measurement Level	Operational Definitions
Response Condition Variables			
Survey Mode	The manner by which a survey is administered to respondents (e.g., mail, email, web, etc.)	Nominal	The total number of usable surveys returned by each of two survey administration modes (mail or web).
Response Wave	The data collection cycle during which a survey was returned	Nominal	The total number of usable surveys returned in each of two data collection cycle categories (Wave 1 and Wave 2). Wave 1 is the first data collection cycle, April-July 2005. Wave 2 is the second, follow-up data collection cycle, September-December 2005.
Demographic Variables			
Gender	The sexual distinction between male and female	Nominal	The category (male or female) that a respondent selects in response to question 41, "What is your gender?"
Ethnicity	The distinction between groups whose members affiliate themselves to a common race or culture	Nominal	The category among seven categories (Black or African American, American Indian or Alaskan Native, Asian, White or Caucasian, Latino or Hispanic, Native Hawaiian or Other Pacific Islander, and Biracial or Multiracial) that a respondent selects in response to question 42, "What is your racial or ethnic background?"
Age	The length of time that a person has lived	Ratio	The total number of years that a respondent has lived as reported in his/her response to question 43, "What is your age? (enter number of years)."
Professional Employment	The length of time that an individual has been employed professionally	Ratio	The total number of years that a respondent has been professionally employed as reported in the ISBE Teacher Service Record report.
Response Quality Variables			
Pronoun Use	The use of words that replace nouns or noun phrases	Ratio	The total number of first person singular "I" and first person plural "we" forms, including their contractions (e.g., I'd, I've, I'll, I'm, we'd, we've, we'll, we'd) used by respondents in response to questions 45-46 and 48.

Table Continued

Table 3 (continued)

Variables	Constitutive Definitions	Measurement Level	Operational Definitions
Item Nonresponse	Survey items that respondents should have been answered but skipped	Ratio	The total number of sub-items (0-130) in questions 2-5, 8-10, 12-14, and 29-48 that a respondent should have answered but skipped.
Response Extremity	A respondent's use of the most extreme response option among a range of forced-choice responses in a Likert or Likert-type scale.	Ratio	The total number of sub-items (0-44) in questions 17, 24-25, 27-29 for which a respondent selected the "76-100%" category from among a range of options (e.g., 1-25%, 26-50%, 51-75%, 76-100%).
Yea-Saying	Instances in which a respondent selects a "yes" response.	Ratio	The total number of sub-items (0-38) in questions 33-40 for which a respondent selected the "yes" response.
Item Completion Errors	Instances in which a respondent provides an answer where one was not expected based on the respondent's response to a prior contingency-type item.	Ratio	For respondents entering a "0" for question 10, the total number of sub-items (0-70) in questions 12, 17-22, 24, 26-27, and 29-31 for which a respondent provided a response where one was not expected. For respondents entering a "No" for question 14, the total number of sub-items (0-88) in questions 15-28 for which a respondent provided a response where one was not expected.
Multiple Response Use	Instances in the mail survey mode in which respondents provide more responses than are expected.	Ratio	In instances where respondents provided more responses than were expected in the mail survey (e.g., provided more than five responses in a "check up to five" item), the additional responses could not be entered into the dataset, so this variable counted those extra items. Thus, this variable is the total number of additional responses that could not be recorded for each mail survey respondent.
Response Length	The word length of a respondent's written response to an open-ended item.	Ratio	The total number of words in a respondent's response to questions 45-46, and 48.
Response Equivalency	A comparison of the mean scores of selected items or collapsed item groups to determine if they are equal.	Ratio	The mean score among 20 sub-items in question 29 containing percent scaled response options (None, 1-25%, 26-50%, 51-75%, 76-100%, NA). The "None" and "NA" categories were removed from analyses because they did not have the same intervals as the remaining categories. The mean score was obtained by adding the score for each sub-item into a total score, and then dividing by the total number of sub-items that each respondent answered.

represented the scope of concepts that should be included. The survey was approved for its intended use.

Instrument reliability, the degree to which an instrument produces consistent scores, was not examined in this study for several reasons. First, the design of the larger study (Kohler et al., 2007) was exploratory in nature, with the purpose of conducting a situational analysis of school counselors' actual versus intended (e.g., within the scope of their job) behaviors at a specific point in time and in a specific context. Second, researchers accepted the assumption that if respondents chose to participate, they did so with the purpose of providing truthful (e.g., valid) and consistent (e.g., reliable) responses. Third, test-retest and equivalent forms reliability analyses were not possible or practical in the larger study, both requiring two administrations of the instrument to the same group. The time and resource costs expended for such analyses exceeded the benefit that would be contributed to the study's exploratory purpose. Finally, considering item content and structure, too few items were available to provide a meaningful internal consistency analysis. An internal consistency analysis is used to examine how well different items complement each other in their ability to measure the same construct or dimension (Fink, 2006; Fraenkel & Wallen, 2006). The survey in the current study did not use multiple items to measure one dimension; each item was instead designed to measure a different dimension.

Item Construction

The 48-item instrument contained the following kinds of items: 34 forced-choice questions with categorical responses, six short-answer questions, four questions with both short-answer and forced-choice responses, and four open-ended questions. Many items were divided into multiple sub-items, so among the 48 main items, there was a total of

253 sub-items. See Figure 1 for an example of an item that combines both short answer and forced-choice responses. Though counted as one item, this item actually contained 10 sub-items, one for each open-ended response option and one for each row of forced-choice response options. Forced-choice response options for this type of item were coded as 1 = None, 2 = 1-25%, 3 = 26-50%, 4 = 51-75%, and 5 = Over 75%.

Figure 1. Sample Item Combining Short Answer and Forced-Choice Response Options

27. For students <u>with</u> disabilities on your caseload, please list up to 5 career assessments and the percentage of students assessed with each:

Name of Assessment	% of students with disabilities				
	None	1 – 25%	26 – 50%	51 – 75%	Over 75%
1. _____	☐	☐	☐	☐	☐
2. _____	☐	☐	☐	☐	☐
3. _____	☐	☐	☐	☐	☐
4. _____	☐	☐	☐	☐	☐
5. _____	☐	☐	☐	☐	☐

Stems and response categories were designed with careful attention to issues of terminology and consistency. Key terms were defined to reduce confusion, and then underlined, bolded, or italicized for clarity where they appeared in a stem or response. For example, “students with disabilities” was defined as follows: “Students with disabilities are students who receive special education services.” Then, the term “with” in “students with disabilities” and the term “without” in “students without disabilities” were bolded to distinguish them. These comparison items appeared several times throughout the survey, so in each instance, “students with disabilities” preceded “students without disabilities” for consistency. Care was taken to use identical main stems when asking questions designed to compare concepts. In six different items, there appeared a single main stem,

followed by two dichotomous sub-stems (with and without disabilities), followed by a set of forced-choice response options. See Figure 2 for an example of this item type. Though considered one item, this item was actually divided into two sub-items, one for the "students with disabilities" response and one for the "students without disabilities" response. Response options for this item were coded as 1 = No One, 2 = I Do, 3 = Other Person, and 4 = NA.

Figure 2. Sample Item with Multiple Sub-Items

21. In your school, who has primary responsibility for implementing career assessment(s) for the students on your caseload?

	No one	I do	Other person	NA
Students with disabilities	☐	☐	☐	☐
Students without disabilities	☐	☐	☐	☐

Some items were designed such that multiple questions were asked simultaneously using an "item-in-a-series" format (Dillman, 2000). For these items, questions were asked that used the same response categories, but distinguished responses between two concepts. See Figure 3 for an example of this item type. Though considered one item, this item was actually divided into six sub-items. Response options were for this type of item were coded as 1 = Yes and 2 = No. For some analyses, 2 = No was recoded as 0 = No.

Survey Modes

Two parallel versions of the questionnaire were developed, each containing 48 items. The mail version contained 16 separate printed pages, including the front and back cover which contained no items (see Appendix D) and the web version contained 10

separate web pages (see Appendix E). The mail version was created using Microsoft Word. The web version was created using online survey software provided by Enterprise Survey Software Systems, Qualtrics Labs, via their web site at http://www.SurveyZ.com.

Figure 3. Sample Item-in-a-Series Format

For questions 33-40, please indicate (1) whether you do the activity and (2) whether you consider the activity to be within the scope of your job.

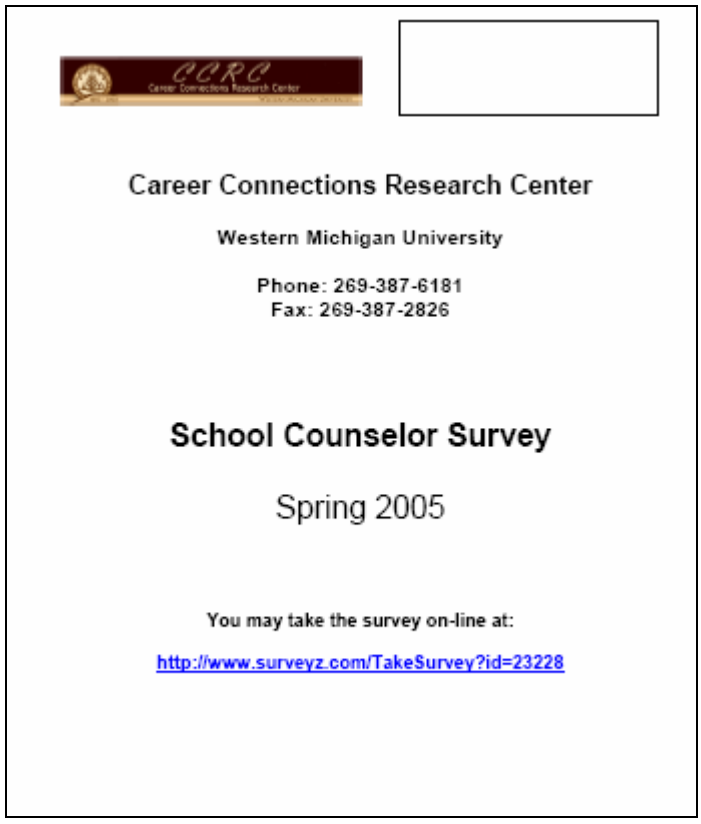
36. Conduct professional development regarding:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Gender and/or ethnic bias	☐	☐	☐	☐
NT careers and/or programs	☐	☐	☐	☐
Sexual harassment prevention	☐	☐	☐	☐

This software service was selected for features including convenience and ease of use, cost, web hosting and site security, the ability to handle multiple respondents simultaneously, and the ability to export data to Microsoft Excel and SPSS formats for analysis. Web survey responses were automatically entered into a secured database hosted by the server to be downloaded later by researchers.

Given that the mail version was each respondent's first contact with the survey (the web link was printed on the cover of the mail version), attention was devoted to preparing an official and professional-looking mail survey using some of Dillman's (2000) and others' suggestions. The front and back covers identified government sponsorships (as suggested by Dillman, 2000; Dillman et al., 1996; Heberlein & Baumgartner, 1978) as well as Western Michigan University's Career Connections Research Center and the researchers' names and contact information (Dillman, 2000) (see Figures 4 and 5).

The opening page of the web version contained no logos, but identified the WMU Career Connections Research Center and included telephone and email contacts (see Figure 6). The page was designed so the university name and welcome messages comprised the first image seen by respondents, then they would scroll down to begin section one. Note in Figure 6 the "3% Complete" message. Each page contained a colored progress bar above this message; however, the bars do not appear in the web page screenshots.

Figure 4. Front Cover of Mail Survey



A letter of support for the study from the Illinois State Board of Education, written on ISBE letterhead, was included in the principal's packet; cover letters to principals and participants were written on university letterhead (see Appendix B and Appendix C) (Dillman, 2000). The survey was designed as a booklet using 8.50 x 14 inch (legal size)

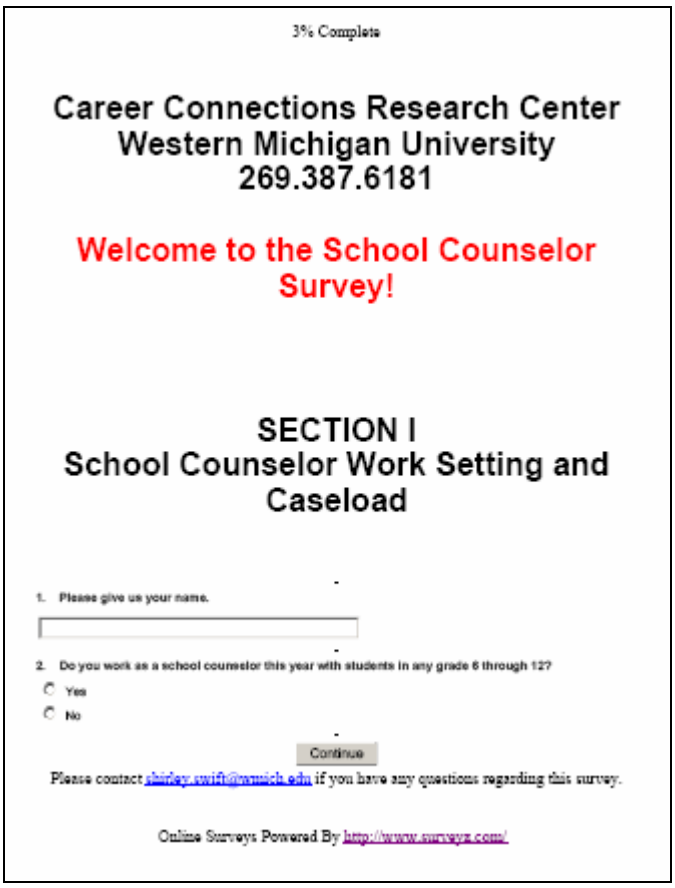
paper, folded in half with two staples in the spine. This booklet format is considered acceptable for multi-page surveys with the added benefit that when folded lengthwise fits nicely into a standard business stationery envelope (Dillman, 2000).

Figure 5. Back Cover of Mail Survey

Web survey formats have been classified into two main types: static (scrollable) and dynamic (interactive) (Dillman, 2000; Tourangeau, 2004). Research is inconclusive regarding which format is better, noting that the static format is better for some tasks while the dynamic is better for others (Dillman, 2000; Norman, Friedman, Norman, & Stevenson, 2001). Dillman (2000) advocates the static approach, which displays the entire survey on a single web page, contains no automated features, permits respondents to scroll up and down the page, and allows respondents to change their answers. The dynamic format uses all or most of the available automated features. Clicking the

"Submit" button in either web survey format would be equivalent to mailing a completed paper survey. The web survey in the current study used a combination of static and dynamic formats. A "Continue" button at the bottom of the web survey's ninth page followed by a final page ("Thank Your For Participating in Our Survey! Your responses have been saved and recorded with ID xxxxx.") was equivalent to clicking the "Submit" button suggested by Dillman (2000).

Figure 6. Screenshot of Web Survey Opening Page



Special attention was devoted to keeping the two versions as similar as possible. Both versions had exactly the same items in the same order; however, some differences occurred due to the nature of the software used to created the web version. Where check boxes and lines were used for forced-choice and open-ended response options in the mail

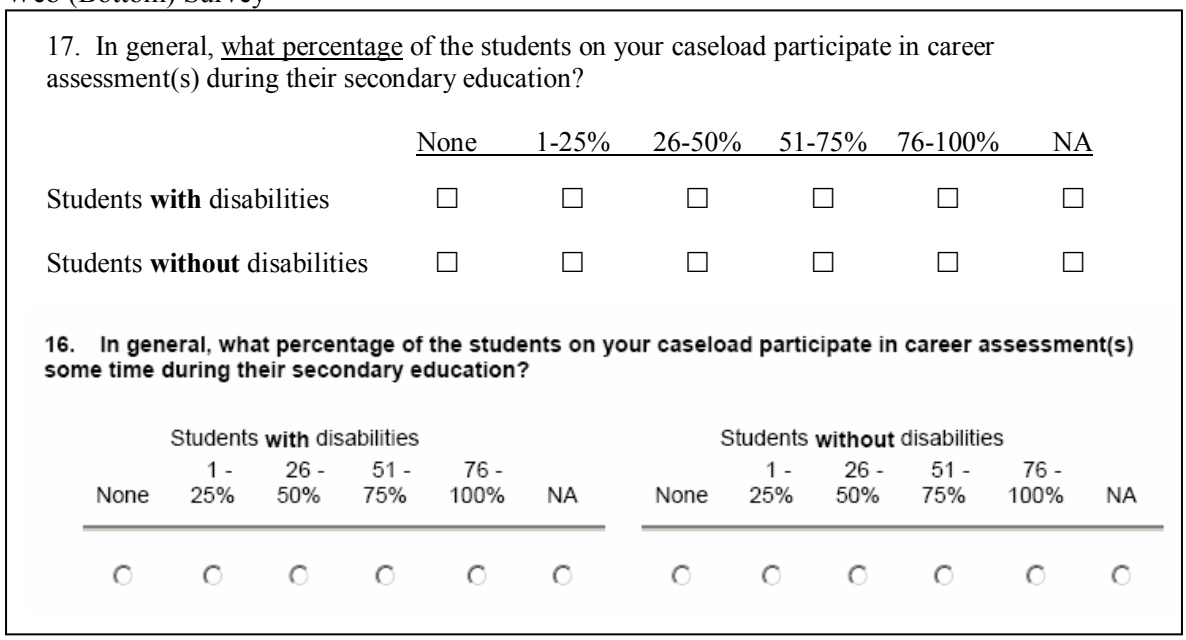
version, check boxes (for "Check all that apply" items), radio buttons (for "Check only one" items) and text boxes were used in the web version. Where written instructions were provided in the mail version for questions five and 15 to indicate branching items, automated branching was used in the web version to avoid making web respondents click and scroll through several pages of items that didn't apply. Thus, these two branching scenarios could be analyzed only by response wave in the mail version. Automated branching was not used in the web version for questions 10 and 14, thereby permitting an analysis of these items by survey mode and by response wave. No error-checking or pop-up features were used in the web version, and participants in both modes were permitted to skip items.

The mail version permitted participants to move forward and backward through the instrument, answer items out of order, and ignore instructions. The web version permitted respondents to move forward and backward and answer items out of order, but only within a web page. Once a web respondent had moved to a subsequent web page, they were prevented from returning to a previous page. There were also some item numbering and formatting differences because the online software provided less flexibility in designing matrix-type items (see Figure 7).

Two key differences in the handling of survey responses by mode were the use of "select only one" items and anecdotal comments. For "select only one" items, web respondents were prevented from selecting multiple items; however, mail respondents could select multiple responses regardless of the instruction not to do so. Additionally, some mail respondents took the opportunity to make anecdotal comments in the margins of their survey items, often to clarify a response; however, the web respondents could

only write responses in text boxes. Thus, an analysis of the use of multiple responses and anecdotal comments could only be conducted in the mail survey by response wave.

Figure 7. Sample Formatting Differences Between Identical Items in the Mail (Top) Versus the Web (Bottom) Survey



17. In general, what percentage of the students on your caseload participate in career assessment(s) during their secondary education?

	None	1-25%	26-50%	51-75%	76-100%	NA
Students **with** disabilities	☐	☐	☐	☐	☐	☐
Students **without** disabilities	☐	☐	☐	☐	☐	☐

16. In general, what percentage of the students on your caseload participate in career assessment(s) some time during their secondary education?

Students **with** disabilities						Students **without** disabilities					
None	1 - 25%	26 - 50%	51 - 75%	76 - 100%	NA	None	1 - 25%	26 - 50%	51 - 75%	76 - 100%	NA
○	○	○	○	○	○	○	○	○	○	○	○

Field Testing

Both questionnaire formats were field tested among with a volunteer group comprised of 10 Michigan school counselors who were identified by Western Michigan University's Counseling Education and Counseling Psychology faculty. Participants each received a $10.00 gift certificate to a major discount store.

Data Collection

Since participants' email addresses were not available, it was necessary to provide initial contact with participants via mail. Additionally, since there were likely to be errors in the ISBE Teacher Service Record report which contained the names of potential participants, the decision was made to confirm the list of names with school building principals before surveys were distributed to participants.

The first data collection cycle, "Wave 1," was conducted April through July 2005 and the second data collection cycle, "Wave 2," was conducted September through December 2005. In late April 2005, a packet was mailed to the principal of each school building where a participant from the target population worked. Principal packets contained an introductory letter, letter of support from the Illinois State Board of Education, Principal's Distribution List, and separate survey packets for each participant in their school (see Appendix B). The introductory letter noted WMU's HSIRB approval (for the larger study) and described the study, how participants were identified, confidentiality, the option for participants to self-select the survey mode, and instructions for distributing surveys to their school counselors.

The Principal's Distribution List noted the name and job title of each participant in the school invited to participate. Principals were instructed to make corrections or add new names to the list as necessary to reflect all of the guidance counselors in the school. Principals were then instructed to return the corrected Principal's Distribution List in an enclosed postage-paid return envelope so researchers could update their participant list. A survey packet for each counselor in the school was provided that included an introductory letter; instructions to voluntarily complete the survey; notice of confidentiality, informed consent, risks, and IRB approvals; approximate amount of time to complete the survey (about 30 minutes); a paper version of the survey questionnaire with the Internet address of the web version printed on the cover; and a postage paid return envelope (see Appendix C). All respondents received identical information and instructions and the web version of the survey was activated the same day that survey packets were delivered to school principals.

As Principal's Distribution Lists were received, researchers updated their participant list and removed the principals' names from the list of principals to receive follow-up notices. About two weeks after the initial mailing, a reminder postcard was delivered to each principal who had not returned their list. About two weeks after that, principals who had still not returned their lists were contacted by phone by a member of the research team to inquire about the status of their list and request that the list be returned.

As surveys were returned from respondents, the respondent's name was removed from the list of nonrespondents, and then each survey was assigned a unique code to protect confidentiality. Mail survey data was then manually entered into a database. Web survey responses were downloaded by researchers from the web survey host's server into Excel files. After assigning the unique codes, each respondent's name was permanently deleted from the data file. Using Dillman's (2000) suggestions to improve response rates, the initial mailing was followed with four first-class reminders. Following the initial delivery of surveys to respondents in April 2005, first reminder postcards were delivered in May, second reminder letters and replacement surveys were delivered in early June, and third reminder postcards were delivered in mid-June. Fourth and final reminder letters and replacement surveys were delivered to nonrespondents in October 2005, producing the "Wave 2" portion of the data collection cycle. This is important given that Wave 2 respondents completed surveys during the 2005-2006 academic year, but items referred to their caseload of students during the 2004-05 academic year.

Although studies suggest that pre-notification letters increase response rate (Dillman, 2000), sending pre-notification letters was not possible in this study due to time

constraints. The survey packet each respondent received from their school principal was the respondent's first notification of the survey.

Population and Sampling

According to Schonlau et al. (2002), the most important question facing a survey researcher in whether the study will use a sample to make inferences about a larger population. If inferences are to be made, then a probability (e.g., random) sample is needed, but if not, a nonprobability sample may suffice (p. 74). Given the exploratory nature of the larger study from which the current study is derived, the decision was made that a random sample was not necessary.

School counselors in Illinois public schools counseling students in grades 6-12 comprised the target population (the population of interest). The names of 3,019 potential participants in 1,502 Illinois public schools were identified via an Illinois State Board of Education (ISBE) Teacher Service Record report. Using information from the ISBE website (http://www.isbe.net/), researchers identified school principals at each site where a school counselor worked. Building and staffing changes occurred in the time between identifying the target population (October 2004) and delivering surveys to participants (April 2005). Therefore, survey packets were first delivered to principals to confirm their counseling staff identities against the names of counselors from the Teacher Service Record report. Principals were instructed to note changes in the list including counselors who were on the list and did not receive a survey (e.g., extended illness, maternity leave, retirement, no longer employed, incorrect address, transferred to another school), counselors who received a survey and were not on the list (e.g., new person replacing a counselor in an existing position), counselors who were on the list and received a survey (including any changes in their names or position titles), special staffing changes (e.g., a

position was eliminated or not filled), and whether more surveys were needed (e.g., adding the names of new counselors in new positions). Principals then delivered a survey packet to each of their counselors, and returned the principal-verified list to researchers. All participants (n = 2,880) on this principal-verified list comprised the accessible population (sampling frame) of participants who were available to participate in the survey. The sampling method is considered a convenience sample (Fraenkel & Wallen, 2006; Schonlau et al., 2002).

The participants in the accessible population had a mean of 19.28 years of professional employment (n = 2,730, SD = 10.57) and worked in schools with a mean enrollment of 1,364.55 students (n = 2,710, SD = 964.68). Among them, 94.46% (n = 2,579) had a masters or doctorate degree, and 93.30% (n = 2,547) worked full time. See Table 4 for characteristics of the accessible population. A chi-square goodness-of-fit analysis was conducted to compare the respondents to the accessible population to determine whether the observed proportions in the sample were statistically different from theoretically expected proportions in the population (Glass & Hopkins, 1996) (see Chapter 4).

Statistical Analysis

Chi-square (χ^2) Analysis

The chi-square goodness-of-fit test is a statistic that determines whether the observed proportions in a sample with two or more groups are statistically different from theoretically expected proportions in the population (Glass & Hopkins, 1996). This statistic was used to compare the sample (n = 880) to the population (n = 2,880). Goodness-of-fit analyses were also conducted for the purpose of model checking.

Categorical variables were first analyzed with a three-way chi-square: 2 (e.g., gender: male, female) x 2 (survey mode: mail, web) x 2 (response wave: one, two) where survey mode and response wave formed the rows and columns respectively. This analysis permits examination of the association between survey mode and response wave while controlling for the effect of each level of the demographic variable.

Table 4

Demographics of Accessible Population (N = 2,880)

Variable	Variable	*n*	%
Highest Degree	Other	13	0.48
(Missing = 150)	Baccalaureate	138	5.05
	Masters	2,527	92.56
	Doctorate	52	1.90
	Total	2,730	100.00
Geographic Region	Cook/Lake	595	21.76
(Missing = 146)	Collar	528	19.31
	Northern	243	8.89
	West/Central	154	5.63
	East/Central	173	6.33
	South/West	122	4.46
	Southern	132	4.83
	Chicago	787	28.79
	Total	2,734	100.00
Locale	Large City & Fringe	1,771	64.68
(Missing = 142)	Mid City & Fringe	412	15.05
	Large & Small Town	206	7.52
	Rural	349	12.75
	Total	2,738	100.00
Employment Status	0-25% time employed	10	0.37
(Missing = 150)	26-50% time employed	49	1.79
	51-75% time employed	94	3.44
	76-100% time employed	2,577	94.40[a]
	Total	2,730	100.00

[a]Full-time (100%) employment = 93.30% (*n* = 2,730)

The Cochran-Mantel-Haenszel (CMH) statistic for general association was used to identify relationships between rows, columns, or strata. This statistic, used for nominal data, assumes an equal odds ratio and tests the null hypothesis that two variables are independent, given a third strata variable. In the current study, for example, this statistic

would test whether the conditional odds ratio of survey mode and response wave among females and males equals one. A statistically significant finding, $p \leq 0.05$, would indicate that survey mode and response wave are not independent when controlling for gender. Such a finding would be followed with chi-square analyses controlling for each level of the categorical variable (Landis, Heyman, & Koch, 1978). A non-significant CMH for general association, $p > 0.05$, would be followed with separate 2x2 chi-squares, one for the categorical variable by survey mode pooled over response wave, and one for the categorical variable by response wave pooled over survey mode.

Assumptions. Regarding chi-square assumptions, observations were independent by the nature of the design by which data were collected. Subjects responded with either a mail or a web survey and either during Wave 1 or Wave 2, thus there was only one observation per subject and only one subject in each of the four respondent groups. Also, categories were mutually exclusive and observations were measured as frequencies. Subjects, however, were not randomly selected from the population, thus the external validity (generalizability) of interpretations from these chi-square analyses will be limited by this violation.

Analysis of Variance (ANOVA)

Since the design in the current study was nonorthogonal, descriptive statistics tables include weighted means and standard deviations for all conditions as well as adjusted means and standard errors for main effects (e.g., survey mode: Mail, Web; response wave: Wave1, Wave2). Continuous variables were analyzed with between-subjects, fixed effects, nonorthogonal (unequal *n*s) analyses of variance (ANOVA) *F*-tests. ANOVA is an inferential parametric statistic that tests the variance of means among two or more groups by comparing the ratio (*F*-ratio) of observed differences to an error

term (Ary et al., 2002). An important criterion of the ANOVA is that the continuous variable being measured must be at least at an interval level (i.e., not nominal or ordinal) (Harwell, 1988). To produce valid results, ANOVAs must also satisfy three assumptions: a) observations or scores must be independent within and between groups, b) groups must have equal (homogeneous) variances, and 3) group means must be normally distributed (Glass, Peckham, & Sanders, 1972; Penfield, 1994; Scheffé, 1959; Stevens, 1996). A test is considered robust if its actual Type I error rate (α), the probability of erroneously rejecting a true null hypothesis, is close to nominal significance level and its actual Type II error rate (statistical power), the probability of correctly rejecting a false null hypothesis, is close to theoretical power (Lix, Keselman, & Keselman, 1996). Violating ANOVA assumptions can affect Type I and Type II error rates (Glass et al., 1972; Lix et al., 1996). Glass et al. (1972) note, "The relevant question is not whether ANOVA assumptions are met exactly, but rather whether the plausible violations of the assumptions have serious consequences on the validity of probability statements based on the standard assumptions" (p. 237).

Assumption of Independence. When using ANOVA, the assumption of independence is the assumption that scores or observations are not influenced by previous scores or other observations. This assumption is a function of a study's design and is addressed by using random sampling and random assignment techniques (Lix et al., 1996). Violating this assumption can negatively affect the Type I error rate and statistical power of the *F*-test (Glass et al., 1972; Scheffé, 1959; Stevens, 1996; Walsh, 1947). The assumption of independence in the current study was addressed by the nature of the design by which data were collected. Subjects responded with either a mail or a web survey and either during Wave 1 or Wave 2, thus there was only one observation per subject and only one

subject in each group (e.g., no repeated measures). The external validity of interpretations from ANOVAs may be limited, however, because subjects were not randomly selected from the population and were not randomly assigned to groups. Rather, all subjects in the sampling frame were invited to participate and subjects were permitted to self-select the survey mode.

Assumption of Homogeneity of Variance. Homogeneity of variance occurs when variance on a dependent variable is equal (homogeneous) across all levels of the independent variable. Heterogeneous variances in nonorthogonal ANOVAs can seriously affect α and reduce theoretical power; therefore, the ANOVA should not be used in this circumstance (Glass et al., 1972). Glass et al. (1972) note that in nonorthogonal designs, the actual α becomes greater than nominal α when a smaller sample is paired with a larger variance, and actual α becomes less than nominal α when a smaller sample is paired with a smaller variance. Thus, a Levene's Homogeneity of Variance test (Levene, 1960), which is also not dependent on the assumption of normality (Snedecor & Cochran, 1980), was conducted prior to each ANOVA to examine the homogeneity of group variances. Since SAS version 9.1 can conduct only a Levene's test in a simple one-way ANOVA model (SAS Institute, 2004), a one (continuous response quality variable) by four (respondent group: Mail1, Mail2, Web1, Web2) ANOVA was used with the "hovtest=levene" option in a proc glm means statement. A non-significant Levene's test ($p > 0.05$) revealing equal variances was followed with a standard two-way ANOVA (survey mode by response wave) using Type-III sums of squares to test main effects and interactions. A significant Levene's test ($p \leq 0.05$) revealing unequal variances was followed with a Welch's Robust Test of Equality of Means ANOVA (Welch, 1947; Welch, 1951) with planned contrasts to test the variance in group means (in SAS, the Welch's ANOVA is only available in the

one-way model). Standard and Welch's ANOVAs revealing statistically significant interactions were followed with analyses of the simple effects. If a Welch's ANOVA was used for the interaction analysis, then a Welch's ANOVA was also used for the simple effects analysis given that the distribution had already been shown by the Levene's test to be heterogeneous.

Assumption of Normality. Normality is a measure of the distribution of scores relative to a normal (symmetrical) curve. In a normal curve, sample means and variances are statistically independent, meaning that the means and variances of repeated samples from the same normally distributed population would correlate to zero (Glass & Hopkins, 1996). Nonnormal distributions are described in terms of skewness and kurtosis. Skewness refers to a distribution's symmetry and indicates that one of its tails is longer than the other. A symmetrical distribution has a skewness of zero. A positively skewed distribution indicates the presence of a longer tail on the positive side of a curve (skewed to the right), which pulls the mean closer toward the extreme scores located on the right side of the distribution. A negatively skewed distribution has the opposite effect, pulling the mean toward extreme scores located on the negative (left) side of the distribution. Kurtosis refers to how peaked or flat a distribution is and how thick or thin its tails are relative to a normal (mesokurtic) distribution (kurtosis = 0). Leptokurtic distributions (kurtosis > 0) are highly peaked distributions with heavy or thick tails, while platykurtic distributions are relatively flat with light or thin tails (Ary et al., 2002). Outliers were included in all data analyses, regardless of the statistics used, because there was no reason to believe that the data were invalid.

ANOVAs are robust to nonnormality (Box, 1953; Glass & Hopkins, 1996; Glass et al., 1972; Hays, 1994; Keselman et al., 1998), even in nonorthogonal designs with

skewed distributions (Glass & Hopkins, 1996; Glass et al., 1972; Schneider & Penfield, 1997); however, kurtosis can affect statistical power when sample sizes are small (Glass et al., 1972). In other words, even if normality assumptions are violated, inferences from ANOVAs do not appear to be seriously invalidated. On the other hand, the Welch's ANOVA is less robust to nonnormality (see "Analysis Using Welch's ANOVA" below).

Analysis Using Welch's ANOVA. The Welch's ANOVA, a parametric robust modification of the standard ANOVA, uses adjusted degrees of freedom and weighted variances instead of pooled variances (Algina & Olejnik, 1984). It is an acceptable alternative to the standard ANOVA when populations are normally distributed and variances are unequal (Algina, Ashima, & Lin, 1994; Clinch & Keselman, 1982; Dijkstra & Werter, 1981; Harwell, Rubinstein, Hayes, & Olds, 1992: Lix et al., 1996; Schneider & Penfield, 1997; Welch, 1947; Welch, 1951; Wilcox, Charlin, & Thompson, 1986; Zijlstra, 2004), especially when designs are nonorthogonal (Alyounes, 1999; Brown & Forsythe, 1974; Glass & Hopkins, 1996; Levy, 1978; Lix et al., 1996). While it is relatively robust to nonnormality in orthogonal designs (Bonett & Price, 2002; Fan, 2006), it may be influenced by the shape of a distribution in nonorthogonal designs (Bonett & Price, 2002; Gans, 1981; Harwell et al., 1992). Error rates can be inflated in nonorthogonal designs, if data are highly skewed (skewness > 2) (Lix et al., 1996; Zijlstra, 2004) or if any of the group sizes is less than 10 (Lix et al., 1996). Welch's appears to be robust to nonnormality when the ratio of the largest to the smallest standard deviation is three or less (Brown & Forsythe, 1974; Wilcox et al., 1986).

In circumstances where nonnormal data may negatively affect Welch's ANOVA results (e.g., skewness > 2, any of the group sizes is less than 10 or ratio of largest to smallest standard deviation < 4), data transformations are suggested to normalize a

nonnormal distribution (Lix et al., 1996). Nonnormal distributions many times result from the presence of outliers. Some researchers suggest using Winsorized or trimmed means instead of the standard least squares statistics to reduce the effects of nonnormality (Lix & Keselman, 1998; Wilcox, 1995). Such methods, however, that change or delete outliers create ethical concerns (Fraenkel & Wallen, 2006) and can change the null hypothesis from testing differences in group means to testing differences in trimmed means (Lix & Keselman, 1998). Data transformations to a different measurement scale (e.g., log or square root) are also suggested where necessary to achieve a more normal distribution (Snedecor & Cochran, 1980; Tabachnick & Fidell, 2001); however, the issue that such transformations can change the null hypothesis from testing differences in group means to testing differences in transformed means is still a concern (Lix & Keselman, 1998). Where data transformations were ineffective, the significance level was shifted from $\alpha = 0.05$ to a more stringent criterion, $\alpha = 0.025$ to correct for distortions resulting from asymmetrical distributions (Keppel, 1991, pp. 97-98). See Alyounes (1999) for details regarding the methodology and behavior of the standard and Welch's ANOVAs.

t-test Analysis

Two continuous response quality variables, anecdotal comments and multiple response use, occurred only in the mail survey, thus were analyzed only by response wave. These variables were analyzed with two-tailed *t*-tests to determine if there were differences in the means by response wave. To produce valid results, *t*-tests are subject to the same three assumptions as ANOVAs: a) observations or scores must be independent, b) groups must have equal (homogeneous) variances, and 3) group means must be normally distributed (Ary et al., 2002; Glass & Hopkins, 1996). As discussed above regarding the assumption of independence, subjects were not randomly selected from the

population, thus the external validity of interpretations from *t*-tests will be limited by this violation. The *t*-test is robust to nonnormality (Boneau, 1960; Glass et al., 1972; Sawilowsky & Blair, 1992). According to Glass and Hopkins (1996), "…the condition of normality can be largely disregarded as a prerequisite for using the *t*-test. The *t*-test is robust with respect to failure to meet the normality assumption." (p. 291). Thus, normality was not examined for these variables. Homogeneity of variance was examined prior to using the *t*-test. If equal variances were revealed, $p > 0.05$, then the pooled method was used. If unequal variances were revealed, $\alpha \leq 0.05$, then the Satterthwaite method was used.

Logistic Regression Analysis

Logistic regression is a specific type of regression analysis that uses the mathematical criterion of maximum likelihood rather than least squares as in multiple regression (Glass & Hopkins, 1996). Its outcome variable is dichotomous (binary) (Hair, Anderson, Tatham, & Black, 1998) and its predictor variables are continuous, discrete or both (Tabachnick & Fidell, 2001). Logistic regression uses a transformation (logit) to force the prediction equation to predict the odds of a discrete outcome (e.g., group membership) from a set of continuous, discrete, dichotomous, or mixed predictor variables. The predictors do not need to be normally distributed (Mertler & Vannatta, 2005; Tabachnick & Fidell, 2001), have equal within-group variance, or be linearly related (Tabachnick & Fidell, 2001). While one of the variables in a logistic regression is an outcome, Tabachnick and Fidell (2001) caution that predictions on the outcome variable are not to be considered causal inferences.

Logistic regression was used to in the current study to examine whether demographic and response quality variables performed differently in their ability to

predict survey mode or response wave. It was selected over discriminant function analysis (DFA), a comparable procedure, for the following reasons:

1. Logistic regression is more robust to assumption violations than discriminant function analysis (Press & Wilson, 1978; Tabachnick & Fidell, 2001). A DFA assumes that predictor variables are normally distributed, linearly related, and have equal covariance matrices (circumstances frequently violated in the current study); whereas a logistic regression is robust to these assumptions (Hair et al., 1998; Press & Wilson, 1978; Tabachnick & Fidell, 2001). Additionally, the DFA is more sensitive to the presence of outliers, requiring either data transformations or that the outliers be eliminated (Tabachnick & Fidell, 2001, p. 462).
2. Logistic regression can handle categorical predictor variables much easier than DFA (Hair et al., 1998). Logistic regression can include any mixture of nominal, ordinal, interval or ratio predictor variables (Tabachnick & Fidell, 2001); however, DFA may not accurately predict the outcome variable when the explanatory variables are dichotomous (Press & Wilson, 1978). Rather, DFA sometimes overestimates the association for dichotomous predictors (Hosmer & Lemeshow, 2000). Given that the discriminant function in a DFA is a linear equation (e.g., a linear combination of the predictor variables), the observed variables should contain a linear relationship; however, this assumption is usually violated when the outcome variable is qualitative (Press & Wilson, 1978).
3. Logistic regression correctly classifies a higher proportion of cases than DFA (Kester, Linton, & Sullivan, 2002; Press & Wilson, 1978). In a study

identifying at-risk students who would be successful in an alternative high school program, Kester et al. (2002) observed that logistic regression produced a predictive true positive hit rate that was 15% greater than DFA.

4. A logistic regression's regression coefficients permit estimating the odds ratios for each of the predictor variables (Cody & Smith, 1997).

A decision needed to be made regarding whether to use a direct (standard), sequential, or stepwise (statistical) logistic regression model. A direct logistic regression, wherein all predictors enter the model simultaneously, is used when there are no specific hypotheses or expectations regarding the importance or order of predictor variables. This procedure permits examination of each predictor's contribution as if each predictor entered the equation last (Tabachnick & Fidell, 2001). Interpretation difficulties can occur, however, when predictors are correlated (Tabachnick & Fidell, 2001). In the current study, an examination of correlations among eight continuous predictor variables revealed three variable pairs correlated at $p \leq 0.05$ and eight pairs correlated at $p \leq 0.01$ (see Table 26). The sequential procedure forces predictors to be added into the model in a sequential order specified by the researcher (SAS Institute, 2004; Tabachnick & Fidell, 2001); however, the researcher must know the order in advance of running the models. In the current study, the order that predictors should be entered into the model is not known in advance. The stepwise procedure automatically adds or removes predictors from the model using statistical criteria (likelihood ratio test) (Tabachnick & Fidell, 2001). Only variables adding a significant amount of prediction power are added or retained in the model, while variables that are redundant or highly correlated with another variable already in the model are eliminated (Mertler & Vannatta, 2005). Since it runs the risk of overfitting the model to noise in the data, it is suggested for use with more exploratory

analyses such as screening and hypothesis-generating (Tabachnick & Fidell, 2001). Therefore, the decision was made to use the stepwise procedure (selection=stepwise option in SAS proc logistic).

Another important decision concerned the appropriate α level of significance. While the default in SAS is $\alpha = 0.05$, Shtatland, Cain, and Barton (2001) suggest that level is inadequate for interpretation and prediction purposes. Hosmer and Lemeshow (2000) suggest using a less stringent criterion such as $\alpha = 0.15$ or 0.20. Using Monte Carlo simulations, Lee and Koval (1997) found that the best α range is 0.05 to 0.40. For this analysis, a significance level of 0.15 (slentry = 0.15 in SAS proc logistic) was selected for a variable to be entered into the model and a significance level of 0.40 (slstay = 0.40) was selected for a variable to stay in the model.

Analysis of Research Questions

Research Question One

Research question one (RQ1) was: "Does a difference exist in demographic characteristics by survey mode or response wave?" The demographic variables were gender, ethnicity, age, and professional employment. The null hypothesis was that there is no difference in demographics by survey mode or response wave. The research sub-questions were:

a) Does a difference exist in gender by survey mode or response wave?
b) Does a difference exist in ethnicity by survey mode or response wave?
c) Does a difference exist in age by survey mode or response wave?
d) Does a difference exist in professional employment by survey mode or response wave?

Gender data were obtained from survey question 41 ("What is your gender?") and ethnicity data were obtained from survey question 42 (What is your racial or ethnic background?"). Age data were obtained from survey question 43 ("What is your age?") while professional employment data were obtained from the Teacher Service Record Report. Ethnicity, originally a seven-category variable (Black or African American, American Indian or Alaskan Native, Asian, White or Caucasian, Latino/Hispanic, Native Hawaiian or Other Pacific Islander, and Biracial or Multiracial), was collapsed into an artificial dichotomous variable (White, Nonwhite) to eliminate cells with expected frequencies of less than five observations in the chi-square analyses. Gender and ethnicity were analyzed using chi-squares. Age and professional employment were analyzed using ANOVAs.

Research Question Two

Research question two (RQ2) was: "Does a difference exist in response quality by survey mode or response wave?" The response quality variables examined by both survey mode and response wave were: pronoun use, item nonresponse, response extremity, yea-saying, item completion errors, response length, and response equivalency. The response quality variables examined by just response wave were: pronoun use in anecdotal comments, response length in anecdotal comments, and multiple response use. The null hypothesis was that that there is no difference in response quality by survey mode or response wave. The research sub-questions were:

a) Does a difference exist in pronoun use by survey mode or response wave?
b) Does a difference exist in pronoun use in anecdotal comments by response wave?

c) Does a difference exist in item nonresponse by survey mode or response wave?

d) Does a difference exist in response extremity by survey mode or response wave?

e) Does a difference exist in yea-saying by survey mode or response wave?

f) Does a difference exist in item completion errors by survey mode or response wave?

g) Does a difference exist in multiple response use by response wave?

h) Does a difference exist in response length by survey mode or response wave?

i) Does a difference exist in the response length of anecdotal comments by response wave?

j) Does a difference exist in response equivalency by survey mode or response wave?

RQ2a: Does a difference exist in pronoun use by survey mode or response wave? The personal pronouns examined include the first person singular "I" and the first person plural "we" including their contractions (e.g., I'd, I've, I'll, I'm, we'd, we've, we'll, we'd). Three open-ended survey items were available for analysis by survey mode and response wave: questions 45, 46, and 48 (see Figure 8). The total number of first person singular and first person plural pronouns in responses to each of these open-ended items was counted for each respondent, and then collapsed into one variable producing a total number of pronouns for each respondent. Analysis was conducted using ANOVAs.

RQ2b: Does a difference exist in pronoun use in anecdotal comments by response wave? The web survey's design prevented respondents from providing anecdotal comments; however, anecdotal comments were provided in some mail surveys. Pronoun use in

anecdotal comments was analyzed in the mail survey by response wave using a two-tailed *t*-test. The personal pronouns examined were the same as those examined for RQ1a: first person singular "I" and the first person plural "we" including their contractions (e.g., I'd, I've, I'll, I'm, we'd, we've, we'll, we'd). The total number of pronouns in anecdotal comments was counted for each mail respondent (n = 566), and then collapsed into one variable producing a total number of pronouns for each respondent.

*Figure 8.*Survey Questions 45, 46, and 48 Used to Analyze Pronoun Use

45. Please list the 2 most rewarding aspects of your job:

1. _____

_____

2. _____

_____

46. Please list the 2 most significant challenges confronting school counselors:

1. _____

_____

2. _____

_____

48. Additional Comments:_____

_____

RQ2c: Does a difference exist in item nonresponse by survey mode or response wave?

Twenty-eight survey items were available to analyze item nonresponse by survey mode and response wave: questions 2-5, 8-10, 12-14, and 29-48. Counting each of their sub-items, a total of 130 sub-items were included. The analysis was set up such that if a

respondent answered "yes" to question two, "Do you work as a school counselor this year with students in any grade 6 through 12?" then that respondent should have also provided a response to each of 130 sub-items that followed question two. The number of instances was counted in which each respondent skipped one of the 130 sub-items that s/he was supposed to answer. The 130 sub-items were collapsed into one variable producing a total number of skipped items for each respondent. A greater score indicated more skipped items and thus greater item nonresponse.

Analysis was conducted using a Welch's ANOVA. Since a nonorthogonal Welch's ANOVA may have inflated error rates if data are highly skewed (skewness > 2) (Lix et al., 1996; Zijlstra, 2004), if any of the group sizes is less than 10 (Lix et al., 1996), or if the ratio of the largest to the smallest standard deviation is four or more (Brown & Forsythe, 1974; Wilcox et al., 1986), additional analyses was conducted to check these assumptions.

RQ2d: Does a difference exist in response extremity by survey mode or response wave?

Six survey items containing percent scaled responses (e.g., 1-25%, 26-50%, etc.) were selected for this analysis: questions 17, 24-25, 27-29. Counting each of their sub-items, a total of 44 sub-items with percent scaled responses were available for analysis. See Figure 9 for an example of these item types.

Item responses were recoded with a value of one assigned to a respondent's use of the 76-100% category and a value of zero assigned for use of any of the remaining categories (as suggested by Naemi, 2006). Next, the number of extreme responses was counted for each respondent for each of the 44 sub-items. The sub-items were then collapsed into one variable producing a total number of extreme responses by survey mode and response wave. Analyses were conducted using ANOVAs.

Figure 9. Sample Item with Percent Scaled Response

17. In general, what percentage of the students on your caseload participate in career assessment(s) during their secondary education?

	None	1-25%	26-50%	51-75%	76-100%	NA
Students **with** disabilities	☐	☐	☐	☐	☐	☐
Students **without** disabilities	☐	☐	☐	☐	☐	☐

RQ2e: Does a difference exist in yea-saying by survey mode or response wave? Eight survey items containing "Yes" and "No" responses were selected for this analysis: questions 33-40. Counting each of their sub-items, a total of 38 sub-items with yes-no responses were available for analysis. See Figure 10 for an example of two sub-items contained within one item.

Figure 10. Sample Item with Yes and No Responses

For questions 33-40, please indicate (1) whether you do the activity and (2) whether you consider the activity to be within the scope of your job.

33. Review career planning materials and practices for:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Gender bias and/or "representation"	☐	☐	☐	☐
Racial or ethnic bias and/or "representation"	☐	☐	☐	☐

Item responses were recoded with a value of one assigned to use of the "yes" response and a value of zero assigned to use of the "no" response. Next, the number of yes responses was counted for each respondent for each of the 38 sub-items. The sub-items were then collapsed into one variable producing a total number of yes responses for each respondent. Analyses were conducted using ANOVAs.

RQ2f) Does a difference exist in item completion errors by survey mode or response wave? Two separate analyses were conducted that examined item completion errors

related to two contingency-type items (questions 10 and 14) by survey mode and response wave. No automated skip, branching or error-checking features were used in the web survey for these items, thereby permitting a survey mode and response wave comparison.

Question 10 analysis. The first analysis examined question 10, a contingency-type item, by survey mode and response wave. Respondents (n = 52) entering a zero for question 10 were indicating that that had no special education students on their caseload. Instructions and a definition in section two of the survey were, "Questions 17 through 28 focus on students with and without disabilities on your caseload. If your caseload does not include specific groups of students, please indicate NA. Students with disabilities are students who receive special education services." Therefore, if a respondent entered a zero in question 10, then the 13 subsequent items in the survey referring to students with disabilities on a respondent's caseload should have been answered with an NA (questions 12, 17-22, 24, 26-27, and 29-31). Counting each of their sub-items, a total of 70 sub-items were available for this analysis by survey mode and response wave. Figure 11 presents question 10 followed by two examples of subsequent items for which a respondent should have selected NA.

Items responses were recoded such that if a respondent entered a zero for question 10 and then correctly entered an NA for a subsequent sub-item, the response was coded as a zero, otherwise, the response was coded as a one, indicating an item completion error. Next, the number of item completion errors was counted for each respondent for each of the 70 sub-items. The sub-items were then collapsed into one variable producing a total number of item completion errors for each respondent.

Question 14 analysis. The second analysis examined question 14, a contingency-type item, by survey mode and response wave. Respondents (n = 112) selecting "No" for

this item were instructed to "Skip to Section 3 – page 7" (question 29). These respondents, therefore, should not have provided responses for any of the 14 questions (questions 15-28) prior to question 29. Counting the sub-items for each of the 14 questions, a total of 88 sub-items were available for this analysis by survey mode and response wave. Figure 12 presents question 14 as it appears on the survey.

Figure 11. Survey Questions 10, 12 and 18

10. Of the students on your total caseload this school year, how many receive special education services?

    ENTER NUMBER of special ed students on your caseload _____

12. Please check how often you will meet individually with the students on your caseload during the school year:

	0-2 times	3-4 times	Over 4 times	NA
Typical student **with** a disability	☐	☐	☐	☐
Typical student **without** a disability	☐	☐	☐	☐

18. How often does the typical student on your caseload participate in career assessment during his/her secondary education?

	None	1-25%	26-50%	51-75%	76-100%	NA
Students **with** disabilities	☐	☐	☐	☐	☐	☐
Students **without** disabilities	☐	☐	☐	☐	☐	☐

Figure 12. Sample Contingency Item, Question 14

14. Generally, do students on your caseload participate in any career assessment(s) at some time during their secondary education? (Check one)

    ☐ Yes ☐ No (Skip to Section 3 – page 7)

Item responses were recoded such that if a respondent entered a response to one of the 88 sub-items that should not have been answered, the response was coded as a one so it could be counted as an item completion error. Otherwise, if a respondent skipped the item, the response was coded as a dot to indicate a missing response. Next, the number of item completion errors was counted for each respondent for each of the 88 sub-items. The sub-items were then collapsed into one variable producing a total number of item completion errors for each respondent. Question 10 and question 14 analyses were both conducted using ANOVAs.

RQ2g: Does a difference exist in multiple response use by response wave? Automated features programmed into the web survey prevented web respondents from providing multiple responses where only one response was expected; however, mail respondents provided multiple responses where such responses were not expected. In order to combine data from both survey modes, rules had to be applied in cases where mail respondents provided multiple responses so that only one response was retained for analysis. For example, in items with categorical responses in which respondents selected multiple categories, the response in the highest, most positive, or most personal category was retained (see Figure 13 for examples of these item types). In open-ended items with instructions stating how many responses to list (e.g., "list three," "list up to five,"), only the first responses provided up to the requested number of responses were retained for analysis (e.g., if five responses were requested, only the first five were retained) and additional responses were not recorded.

Analysis of the impact of applying rules to eliminate multiple responses is beyond the scope of this study; however, a two-tailed *t*-test analysis was conducted to determine if multiple response use in Mail1 differed statistically from Mail2. A variable was created

to count the number of additional responses that could not be recorded for each mail respondent (n = 566), producing a total number of multiple responses for each mail respondent.

RQ2h: Does a difference exist in response length by survey mode or response wave?

Three open-ended items were available for analysis by survey mode and response wave: questions 45-46, and 48. A substantial amount of data cleaning was required to convert typographical errors, symbols and variations of words and phrases into common forms so they could be counted equally among respondents (see Figure 14).

Prior to data cleaning "self-esteem," "selfesteem," and "self esteem" would have been counted as one, one and two words respectively; "NCLB" and "No Child Left Behind" would have been counted as one and four words respectively; and "2x2," "two-by-two," and two by two" would have been counted as one, one and three words respectively. The Merriam-Webster Online Dictionary (Merriam-Webster, 2005) was consulted for proper word forms where possible. Figure 15 presents the variations of words that were assigned specific word length values. Punctuations markings (e.g., quotations, dashes, slashes, periods, etc.) were not included in response length counts.

The number of words in each respondent's response to each of the three items was counted. Then, the total number of words in each of the three items was collapsed into one variable producing a total response length for each respondent.

Analysis was conducted using a Welch's ANOVA. Since a nonorthogonal Welch's ANOVA may have inflated error rates if data are highly skewed (skewness > 2) (Lix et al., 1996; Zijlstra, 2004), if any of the group sizes is less than 10 (Lix et al., 1996), or if the ratio of the largest to the smallest standard deviation is four or more (Brown & Forsythe, 1974; Wilcox et al., 1986), an analysis was conducted to check these

assumptions. Since skewness exceeded the recommendations for a robust Welch's ANOVA, a second analysis was conducted to determine if using a data transformation to normalize the skewed distribution produced different results (Lix et al., 1996). A square root transformation was used to draw in the extreme scores on the positive side of the distribution (Snedecor & Cochran, 1980; Tabachnick & Fidell, 2001).

RQ2i: Does a difference exist in the response length of anecdotal comments by response wave? Response length in anecdotal comments was analyzed in the mail survey by Wave 1 and Wave 2 using a two-tailed *t*-test. The total number of words in each mail respondent's response to each of three items (questions 45, 46, and 48) was counted. Then, the total number of words in each of the three items was collapsed into one variable producing a total response length for each respondent.

RQ2j: Does a difference exist in response equivalency by survey mode or response wave? One survey item (question 29) containing 20 sub-items with percent scaled responses (None, 1-25%, 26-50%, 51-75%, 76-100%, NA) was available for analysis. The mean score of each of the 20 sub-items was calculated and then compared. See Figure 15 for an example of these item types.

The response scale comprised the first category labeled "None," followed by four categories with equal intervals each representing one quarter of 100%, followed by a sixth and final category labeled "NA." Since a valid comparison of the means when using an ANOVA requires that the dependent variable being measured must be at least at an interval level (i.e., not nominal or ordinal) (Harwell, 1988), the two categories in the response scale that were not equal intervals with the remaining four were assigned a value of "missing" (e.g., a dot in SAS) and thus removed from the analysis. The remaining

categories retained their original assigned values as follows: 1-25% = 2, 26-50% = 3, 51-75% = 4, and 76-100% = 5.

Figure 13. Examples of Partial Items for Which Mail Respondents Provided Multiple Responses and the Rules Used to Determine the Retained Response

Survey Item with Multiple Responses Selected	Retained Response
12. Please check how often you will meet individually with the students on your caseload during the school year: 0-2 times 3-4 times Over 4 times NA Typical student with a disability ☑ ☐ ☑ ☐	☑ Over 4 times (greatest)
18. How often does the typical student on your caseload participate in career assessment during his/her secondary education? None 1-25% 26-50% 51-75% 76-100% NA Students with disabilities ☐ ☐ ☑ ☑ ☐ ☐	☑ 51-75% (greatest)
21. In your school, who has primary responsibility for implementing career assessment(s) for the students on your caseload? No one I do Other Person NA Students with disabilities ☐ ☑ ☑ ☐	☑ I do (most personal)
33. Review career planning materials and practices for: Yes No Gender bias and/or "representation" ☑ ☑	☑ Yes (most positive)

Of 880 total respondents, 729 respondents provided a response to one or more of the 20 sub-items in question 29, while 151 respondents skipped all of the sub-items in question 29. Of the 729 respondents who provided a response to one or more sub-items, 29 were removed from the analysis because they provided no responses to any of the four interval-level categories (1-25%, 26-50%, 51-75%, 76-100%). Thus, 700 respondents were included in this analysis.

Figure 14. Variations of Words in Open-Ended Responses that Were Assigned Specific Word Length Values

Variations of Words that were All Counted as One Word	
CRUISING COM	OVER LOAD
CASE LOAD	PAPER WORK
CITY WIDE	PART TIME
C O P S, C.O.P.S.	POST GRAD
CO WORKER	POST SECONDARY
E G, E.G.	PRE K
E MAIL	PRE REGISTRATION
EVERY DAY	PRE SCHOOL
FACE TO FACE	PRE TEEN
I E, I.E.	RE ENTERING
KEY ORG	SELF ESTEEM
MULTI CULTURAL	STATE WIDE
NON CERTIFIED	WELL BEING
NON TRADITIONAL	WORK LOAD
ONE ON ONE, ONE TO ONE, 1 TO 1	WORK ROOM
OVER EMPHASIS	
Variations of Words that were All Counted as Two Words	
ALOT	LASTNAME
CAREERKEY, CAREER-KEY	PHONECALL
CAREERCRUISING	SCHOOLWIDE, SCHOOL-WIDE
FIELDTRIP	2X, 2-TIMES
FOLLOWUP, FOLLOW-UP	WORKKEY, WORK-KEY

A variable was created to calculate a mean score for each of the 700 respondents included in the analysis. This score was obtained by adding the score for each sub-item into a total score, and then dividing by the total number of sub-items that each respondent answered. A lower mean score indicated that the respondent's answers were closer to the lower end of the scale (1-25% category = 2) and a higher mean score indicated that responses were closer to the higher end of the scale (76-100% category = 5). A mean score was used rather than a total score for each respondent to permit comparing the collapsed 20 sub-items to the original scale. For example, the mean score range was two to five, the same as the original scale, whereas the total score range was two to 100. Analyses were conducted using ANOVAs.

Figure 15. Sample Item with Percent Scaled Response Options

29. For each of the following, please indicate the proportion of students on your caseload with whom you typically implement or include in the activity.

	Students **with** disabilities						Students **without** disabilities					
	None	1-25%	26-50%	51-75%	76-100%	NA	None	1-25%	26-50%	51-75%	76-100%	NA
Administer career assessment(s)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information regarding results of career assessments	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Assist students to identify career goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information about careers and/or options	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Research Question Three

Research question three (RQ3) was: "Do demographic characteristics and response quality predict survey mode or response wave?" The null hypothesis was that demographic characteristics and response quality don't predict survey more or response wave. The research sub-questions were:

a. Do demographic characteristics and response quality predict survey mode?

b. Do demographic characteristics and response quality predict response wave?

Binary stepwise logistic regressions (selection = stepwise in SAS proc logistic) with a requirement of 0.15 to enter the model and 0.40 to stay in the model (slentry = 0.15 and slstay = 0.40) were used to examine whether demographic and response quality

variables performed differently in predicting survey mode or response wave. The categorical predictor variables were gender (coded as male = 0 and female = 1) and ethnicity (coded as Nonwhite = 0 and White = 1). The continuous predictor variables were age, professional employment, pronoun use, response extremity, yea-saying, item completion errors, response length, and response equivalency. Given that the item completion error variable (RQ2f) had such a small number of cases (n = 52 for Question 10 and n = 112 for Question 14) compared to other variables in the model having ns of 700 or greater, the item completion error variable was not included in these analyses. The outcome variables were survey mode (coded as mail = 0 and web = 1) and response wave (coded as Wave 1 = 1 and Wave 2 = 2). In the logistic regression predicting survey mode, response wave was added to the predictors, and in the logistic regression model predicting response wave, survey mode was added to the predictors. All 11 predictors were entered into each model.

CHAPTER IV

RESULTS

Chapter 4 presents the results of data analysis for this study and is arranged into six sections. The first section presents response rates for the overall sample as well as by survey mode and response wave. The second and third sections address sample representativeness and respondent demographics respectively. The fourth section presents the results of analyses for research question one and its four sub-questions. The fifth section presents the results for research question two and its 10 sub-questions. The last section presents the results for research question three and its two sub-questions.

Response Rates

School counselors in Illinois public schools counseling students in grades 6-12 comprised the target population of 3,019 potential participants identified via an Illinois State Board of Education Teacher Service Record report. After accounting for participants unable to participate (e.g., extended illness, maternity leave, retirement, no longer employed, incorrect address), the adjusted accessible population was 2,880 Illinois public school counselors counseling students in grades 6-12 during the 2004-05 academic year.

Total survey response rate was 35.69% (n = 1,028). After accounting for respondents who returned blank, incomplete, unusable, and multiple surveys, the adjusted response rate was 30.56% (n = 880). Table 5 presents the distribution of response rates by survey mode and response wave. Mail1 respondents had the highest response rate (n = 433, 49.20%) and Web2 (n = 63, 7.16%) had the lowest. Differences between response conditions were not statistically significant, χ^2 (1, N = 880) = 1.38, p = 0.24. Table 6

presents actual and expected frequencies for response rates by survey mode and response wave.

Table 5

Descriptive Statistics for Response Rate by Survey Mode and Response Wave ($N = 880$)

	n	*%*
Survey Mode		
Mail	566	64.32
Web	314	35.68
Response Wave		
Wave 1	684	77.73
Wave 2	196	22.27
Survey Mode x Response Wave		
Mail1	433	49.20
Mail2	133	15.11
Web1	251	28.52
Web2	63	7.16
Total	880	100.00

Table 6

Actual and Expected Frequencies for Response Rates by Survey Mode and Response Wave (N = 880)

Response Conditions	Actual *n*	Actual *%*	Expected (2x2 χ^2, Mode by Wave) *n*	Expected (2x2 χ^2, Mode by Wave) *%*	Expected (Goodness-of-Fit) *n*	Expected (Goodness-of-Fit) *%*
Mail1	433	49.20	439.94	49.99	220	25.00
Mail2	133	15.11	126.06	14.33	220	25.00
Web1	251	28.52	244.06	27.73	220	25.00
Web2	63	7.16	69.94	7.95	220	25.00
Total	880	100.00	69.94	100.00	880	100.00
Result			χ^2 (1, $N = 880$) = 1.38, $p = 0.24$		χ^2 (3, $N = 880$) = 357.04, $p < 0.0001$	

Sample Representativeness

Table 7 presents the results of chi-square (χ^2) goodness-of-fit tests, which were used to examine the representativeness of the sample as compared to the population. Four categorical variables were available for this analysis: highest degree, geographic region, locale, and professional employment. Sample statistics for survey respondents were compared to population parameters from the Teacher Service Record report provided by

the Illinois State Board of Education. For this analysis, the population parameter size (n = 2,738) is lower than the accessible population size (n = 2,880) and the sample statistic size (n = 808) is lower than the actual sample size (n = 880) due to missing data (n = 142).

Some of the levels in the "highest degree" variable were collapsed to eliminate cells with expected frequencies of less than five observations in the chi-square analysis. The "Up To Bachelor" category is comprised of two original categories: "None" and "Baccalaureate." The "Master & Other Advanced" category is comprised of two original categories: "Certificate of Advanced Study, Specialist, and Six-Year Certificate" and "Masters." Some levels of the locale variable were also collapsed to create cells with a minimum of five observations. For example, "Large City" and "Urban Fringe of Large City" were collapsed into "Large City & Fringe," "Mid-size City" and "Urban Fringe of Mid-size City" were collapsed into "Mid City & Fringe," and "Large Town" and "Small Town" were collapsed into "Large & Small Town." The continuous variable, professional employment, was separated into nine five-year increments for analysis.

Chi-square goodness of fit analyses revealed that the sample did not differ statistically from the population by highest degree, χ^2 (2, N = 805) = 1.60, p = 0.45, or by professional employment, χ^2 (8, N = 804) = 10.55, p = 0.23. Thus, the null hypothesis that there is no difference in highest degree between the sample and the population, and the null hypothesis that there is no difference in professional employment between the sample and the population were both not rejected at $\alpha \leq 0.05$.

Table 7

Chi-square Goodness-of-Fit Analysis of Sample Representativeness

	Sample		Population				
Variable	*n*	%	*n*	%	χ^2	df	*p*
Highest Degree							
Up to Bachelor	34	4.22	141	5.16	1.60	2	0.45
Master & Other Advanced	754	93.66	2537	92.93			
Doctorate	17	2.11	52	1.90			
Total	805	100.00	2730	100.00			
Missing	*3*		*8*				
Geographic Region							
Cook/Lake	170	21.07	595	21.76	42.58	7	<0.0001
Collar	172	21.31	528	19.31			
Northern	97	12.02	243	8.89			
West/Central	65	8.05	154	5.63			
East/Central	54	6.69	173	6.33			
South/West	35	4.34	122	4.46			
Southern	50	6.20	132	4.83			
Chicago	164	20.32	787	28.79			
Total	807	100.00	2734	100.00			
Missing	*1*		*4*				
Locale							
Large City & Fringe	468	57.92	1771	64.68	24.34	3	<0.0001
Mid City & Fringe	121	14.98	412	15.05			
Large & Small Town	82	10.15	206	7.52			
Rural	137	16.96	349	12.75			
Total	808	100.00	2734	100.00			
Missing	*0*		*0*				
Professional Employment							
0-5 years	94	11.69	299	10.96	10.55	8	0.23
6-10 years	113	14.05	378	13.86			
11-15 years	141	17.54	471	17.27			
16-20 years	112	13.93	354	12.98			
21-25 years	91	11.32	268	9.83			
26-30 years	128	15.92	429	15.73			
31-35 years	95	11.82	389	14.26			
36-40 years	28	3.48	117	4.29			
41 & up years	2	0.25	22	0.81			
Total	804	100.00	2723	100.00			
Missing	*4*		*11*				

The sample does not represent the population by geographic region, χ^2 (7, N = 807) = 42.58, $p < 0.0001$, or by locale, χ^2 (3, N = 808) = 24.34, $p < 0.0001$. Thus, the null hypothesis that there is no difference in geographic region between the sample and the population, and the null hypothesis that there is no difference in locale between the

sample and the population were both rejected at $\alpha \leq 0.05$. Chicago is the most under-represented geographic region (sample = 20.32%, population = 28.79%, difference = 8.47%) and Northern is the most over-represented geographic region (sample = 12.02%, population = 8.89%, difference = 3.13%). Given that Chicago was the most under-represented geographic region, it follows that Large City & Fringe was the most underrepresented locale (sample = 57.92%, population = 64.68%, difference = 6.76%). Rural was the most over-represented locale (sample = 16.96%, population = 12.75%, difference = 4.21%).

In summary, the study sample appears to represent the population based on highest degree and professional employment but not based on geographic region and locale.

Respondent Demographics

Descriptive statistics for respondent demographics by survey mode and response wave are presented in Table 8 for gender and ethnicity. Respondents were 75.03% female (n = 553) and 24.97% male (n = 184) with more females than males represented in each of the four respondent groups as well as for the overall sample. Regarding ethnicity, the majority of respondents were White (86.40%, n = 629) with more Whites than any other ethnic group represented in each of the four respondent groups and for the overall sample. Black/African Americans comprised the second largest ethnic group (9.48%, n = 69) and all of the other ethnic groups combined comprised the remaining 4.12% (n = 30) of the ethnic distribution. Inferential statistics for gender and ethnicity are presented in the results for research question one.

Table 8

Descriptive Statistics for Gender and Ethnicity by Survey Mode and Response Wave (N = 880)

	Wave 1		Wave 2		Total	
Gender	*n*	%	*n*	%	*n*	%
Female						
Mail	311	42.20	107	14.52	418	56.72
Web	104	14.11	31	4.21	135	18.32
Subtotal	415	56.31	138	18.72	553	75.03
Male						
Mail	106	14.38	22	2.99	128	17.37
Web	44	5.97	12	1.63	56	7.60
Subtotal	150	20.35	34	4.61	184	24.97
Total						
Mail	417	56.58	129	17.50	546	74.08
Web	148	20.08	43	5.83	191	25.92
Total	565	76.66	172	23.34	737	100.00
Ethnicity						
White/Caucasian						
Mail	359	49.31	103	14.15	462	63.46
Web	129	17.72	38	5.22	167	22.94
Subtotal	488	67.03	141	19.37	629	86.40
Black/African American						
Mail	41	5.63	19	2.61	60	8.24
Web	8	1.10	1	0.14	9	1.24
Subtotal	49	6.73	20	2.75	69	9.48
Latino/Hispanic						
Mail	8	1.10	4	0.55	12	1.65
Web	6	0.82	1	0.14	7	0.96
Subtotal	14	1.92	5	0.69	19	2.61
Asian						
Mail	4	0.55	2	0.27	6	0.82
Web	1	0.14	1	0.14	2	0.27
Subtotal	5	0.69	3	0.41	8	1.10
Native Hawaiian/Pacific Islander						
Mail	0	0.00	0	0.00	0	0.00
Web	2	0.27	0	0.00	2	0.27
Subtotal	2	0.27	0	0.00	2	0.27
Biracial/Multiracial						
Mail	0	0.00	1	0.14	1	0.14
Web	0	0.00	0	0.00	0	0.00
Subtotal	0	0.00	1	0.14	1	0.14
Native American/Alaskan Native						
Mail	0	0.00	0	0.00	0	0.00
Web	0	0.00	0	0.00	0	0.00
Subtotal	0	0.00	0	0.00	0	0.00
Total						
Mail	412	56.59	129	17.72	541	74.31
Web	146	20.05	41	5.63	187	25.69
Total	558	76.65	170	23.35	728	100.00

Note: missing = 143 for Gender and missing = 152 for Ethnicity.

Table 9 presents descriptive statistics for age and professional employment demographics by survey mode and response wave. Respondents had an age range of 25-73 years with a mean age of 47.82 years (*SD* = 10.32). Mail1 respondents were the oldest (*M* = 49.36, *SD* = 9.94) and Web2 were the youngest (*M* = 42.03, *SD* = 11.52).

Respondents had a professional employment range of 1-43 years with a mean of 18.58 years (*SD* = 10.08). Mail1 respondents had the most years of professional employment (*M* = 19.64, *SD* = 9.99) and Web1 had the least (*M* = 16.69, *SD* = 9.95). Inferential statistics for age and professional employment are presented in the results for research question one.

Table 9

Descriptive Statistics for Age and Professional Employment by Survey Mode and Response Wave (N = 880)

	Age (*n* = 707)					Professional Employment (*n* = 806)				
	n	*M*	*SD*	M_{Adj}	SE_{Adj}	*n*	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode										
Mail	524	49.19	9.90	49.00	0.52	530	19.54	9.94	19.42	0.52
Web	183	43.89	10.52	43.21	0.91	276	16.73	10.12	16.82	0.79
Resp. Wave										
Wave 1	546	48.05	10.24	46.88	0.49	641	18.59	10.07	18.16	0.41
Wave 2	161	47.03	10.60	45.33	0.93	165	18.55	10.15	18.08	0.86
Mode x Wave										
Mail1	402	49.36	9.94			413	19.64	9.99		
Mail2	122	48.63	9.81			117	19.20	9.78		
Web1	144	44.39	10.22			228	16.69	9.95		
Web2	39	42.03	11.52			48	16.96	10.96		
Total	707	47.82	10.32			806	18.58	10.08		

Note: Age missing = 173 and Professional Employment missing = 74.

In summary, the majority of respondents in each of the four respondent groups as well as for the overall sample were White (*n* = 629, 86.40%) and female (*n* = 553, 75.03%). Respondents had a mean age of 47.82 years (*SD* = 10.32) with a mean of 18.58 years (*SD* = 10.08) of professional employment.

Results of Research Questions

Research Question One

Research question one (RQ1) was: "Does a difference exist in demographic characteristics by survey mode or response wave?" The research sub-questions were:

a) Does a difference exist in gender by survey mode or response wave?
b) Does a difference exist in ethnicity by survey mode or response wave?
c) Does a difference exist in age by survey mode or response wave?
d) Does a difference exist in professional employment by survey mode or response wave?

RQ1a: Does a difference exist in gender by survey mode or response wave? See Table 8 for descriptive statistics for gender. Analysis of gender by survey mode and response wave was conducted using a 2x2x2 chi-square. The CMH statistic for general association revealed no statistically significant relationship between rows, columns or strata, χ^2 (1, N = 737) = 0.04, p = 0.84. Separate 2x2 analyses followed, revealing no statistically significant differences for gender by survey mode pooled over response wave, χ^2 (1, N = 737) = 2.61, p = 0.11, or for gender by response wave pooled over survey mode, χ^2 (1, N = 737) = 3.24, p = 0.07. Thus, the null hypothesis that there is no difference in gender by survey mode or response wave was not rejected at $\alpha \leq 0.05$. See Table 10 for chi-square actual and expected frequencies for gender.

RQ1b: Does a difference exist in ethnicity by survey mode or response wave? See Table 8 for descriptive statistics for ethnicity. Analysis of ethnicity by survey mode and response wave was conducted using a 2x2x2 chi-square. Ethnicity, originally a seven-category variable was collapsed into a dichotomous variable (White, Nonwhite) for analysis. The

CMH statistic for general association revealed no statistically significant relationship between rows, columns or strata, χ^2 (1, N = 728) = 0.21, p = 0.64. Separate 2x2 analyses followed, revealing no statistically significant differences for ethnicity by survey mode pooled over response wave, χ^2 (1, N = 728) = 1.81, p = 0.18, or for ethnicity by response wave pooled over survey mode, χ^2 (1, N = 728) = 2.26, p = 0.13. Thus, the null hypothesis that there is no difference in ethnicity by survey mode or response wave was not rejected at $\alpha \leq 0.05$. See Table 11 for chi-square actual and expected frequencies for ethnicity.

Table 10

Actual and Expected Frequencies for Gender by Survey Mode and Response Wave (N = 880)

		Wave 1		Wave 2		Total	
		n	Expected	*n*	Expected	*n*	Expected
Female	Mail	311	313.69	107	104.31	418	409.69
	Web	104	101.31	31	33.69	135	143.31
	Total	415	423.94	138	129.06	553	
Male	Mail	106	104.35	22	23.65	128	136.31
	Web	44	45.65	12	10.35	56	47.69
	Total	150	141.06	34	42.94	184	
Total	Mail	417		129		546	
	Web	148		43		191	
	Total	565		172		737	

Note: missing = 143.

RQ1c: Does a difference exist in age by survey mode or response wave? See Table 9 for descriptive statistics for age. Levene's test revealed homogeneity of group variances, F(3, 703) = 0.93, p = 0.42, so a standard ANOVA followed. The ANOVA indicated a statistically significant difference by survey mode, F(1, 703) = 30.59, $p < 0.0001$, but not by response wave, F(1, 703) = 2.19, p = 0.14, and no interaction, F(1, 703) = 0.61, p = 0.44. Thus, the null hypothesis that there is no difference in age by survey mode or

response wave was rejected at $\alpha \leq 0.05$. Mail respondents ($M_{Adj} = 49.00$, $SE_{Adj} = 0.52$) were older than web respondents ($M_{Adj} = 43.21$, $SE_{Adj} = 0.91$).

Table 11

Actual and Expected Frequencies for Ethnicity by Survey Mode and Response Wave (N = 880)

		Wave 1		Wave 2		Total	
		n	Expected	*n*	Expected	*n*	Expected
White	Mail	359	358.44	103	103.56	462	467.43
	Web	129	129.56	38	37.44	167	161.57
	Total	488	482.12	141	146.88	629	
Nonwhite	Mail	53	55.86	26	23.14	79	73.57
	Web	17	14.14	3	5.86	20	25.43
	Total	70	75.88	29	23.12	99	
Total	Mail	412		129		541	
	Web	146		41		187	
	Total	558		170		728	

Note: missing = 152.

RQ1d: Does a difference exist in professional employment by survey mode or response wave? See Table 9 for descriptive statistics for professional employment. Levene's test revealed homogeneity of group variances, $F(3, 802) = 0.67$, $p = 0.57$, so a standard ANOVA followed. The ANOVA indicated a statistically significant difference by survey mode, $F(1, 802) = 7.44$, $p = 0.01$, but not by response wave, $F(1, 802) = 0.01$, $p = 0.93$, and no interaction, $F(1, 802) = 0.14$, $p = 0.71$. Thus, the null hypothesis that there is no difference in professional employment by survey mode or response wave was rejected at $\alpha \leq 0.05$. Mail respondents ($M_{Adj} = 19.42$, $SE_{Adj} = 0.52$) had more years of professional employment than web respondents ($M_{Adj} = 16.82$, $SE_{Adj} = 0.79$).

RQ1 Summary. Results revealed that gender and ethnicity did not differ by survey mode or response wave; however, both age and professional employment differed by survey mode but not by response wave (see Table 12). Mail respondents ($M_{Adj} = 49.00$, $SE_{Adj} = 0.52$) were older than web respondents ($M_{Adj} = 43.21$, $SE_{Adj} = 0.91$) and mail respondents

(M_{Adj} = 19.42, SE_{Adj} = 0.52) had more years of professional employment than web respondents (M_{Adj} = 16.82, SE_{Adj} = 0.79).

Research Question Two

Research question two (RQ2) was: "Does a difference exist in response quality by survey mode or response wave?" The research sub-questions were:

a) Does a difference exist in pronoun use by survey mode or response wave?
b) Does a difference exist in pronoun use in anecdotal comments by response wave?
c) Does a difference exist in item nonresponse by survey mode or response wave?
d) Does a difference exist in response extremity by survey mode or response wave?
e) Does a difference exist in yea-saying by survey mode or response wave?
f) Does a difference exist in item completion errors by survey mode or response wave?
g) Does a difference exist in multiple response use by response wave?
h) Does a difference exist in response length by survey mode or response wave?
i) Does a difference exist in the response length of anecdotal comments by response wave?
j) Does a difference exist in response equivalency by survey mode or response wave?

Table 12

Summary of Results for Research Question One

Variable	Statistical Test	Test Results	Conclusion
Gender	2x2x2 chi-square, CMH statistic	χ^2 (1, N = 737) = 0.04, p = 0.84	
	2x2 chi-square, gender x mode	χ^2 (1, N = 737) = 2.61, p = 0.11	No differences
	2x2 chi-square, gender x wave	χ^2 (1, N = 737) = 3.24, p = 0.07	
Ethnicity	2x2x2 chi-square, CMH statistic	χ^2 (1, N = 728) = 0.21, p = 0.64	
	2x2 chi-square, ethnicity x mode	χ^2 (1, N = 728) = 1.81, p = 0.18	No differences
	2x2 chi-square, ethnicity x wave	χ^2 (1, N = 728) = 2.26, p = 0.13	
Age	ANOVA, mode main effect	F(1, 703) = 30.59, p < 0.0001	Mail > Web (M_{Adj} = 49.00, SE_{Adj} = 0.52) > (M_{Adj} = 43.21, SE_{Adj} = 0.91)
	ANOVA, wave main effect	F(1, 703) = 2.19, p = 0.14	No difference
	ANOVA, mode x wave interaction	F(1, 703) = 0.61, p = 0.44	No difference
Professional Employment	ANOVA, mode main effect	F(1, 802) = 7.44, p = 0.01	Mail > Web (M_{Adj} = 19.42, SE_{Adj} = 0.52) > (M_{Adj} = 16.82, SE_{Adj} = 0.79)
	ANOVA, wave main effect	F(1, 802) = 0.01, p = 0.93	No difference
	ANOVA, mode x wave interaction	F(1, 802)= 0.14, p = 0.71	No difference

RQ2a: Does a difference exist in pronoun use by survey mode or response wave? Table 13 presents descriptive statistics for pronoun use by survey mode and response wave. Respondents had a pronoun use range of 0-7 pronouns with an overall mean of 0.31 (*SD* = 0.86) pronouns. Web2 respondents provided the most pronouns (*M* = 0.44, *SD* = 1.12) and Mail1 provided the least (*M* = 0.25, *SD* = 0.71).

Table 13

Descriptive Statistics for Pronoun Use by Survey Mode and Response Wave (N = 880)

	n	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	566	0.28	0.75	0.31	0.04
Web	314	0.37	1.02	0.40	0.06
Response Wave					
Wave 1	684	0.29	0.82	0.30	0.03
Wave 2	196	0.40	0.96	0.41	0.07
Mode x Wave					
Mail1	433	0.25	0.71		
Mail2	133	0.38	0.88		
Web1	251	0.35	0.99		
Web2	63	0.44	1.12		
Total	880	0.31	0.86		

Levene's test indicated homogeneity of group variances, $F(3, 876) = 1.69$, $p = 0.17$, so a standard ANOVA followed. The ANOVA revealed no statistically significant main effects by survey mode, $F(1, 876) = 1.23$, $p = 0.27$, or by response wave, $F(1, 876) = 2.27$, $p = 0.13$, and no interaction, $F(1, 876) = 0.03$, $p = 0.86$. The null hypothesis that that there is no difference in pronoun use by survey mode or response wave was not rejected at $\alpha \leq 0.05$.

RQ2b: Does a difference exist in pronoun use in anecdotal comments by response wave? See Table 14 for descriptive statistics for pronoun use in anecdotal comments by response wave. Respondents had a pronoun use range of 0-5 pronouns with a mean of 0.15 (*SD* = 0.56) pronouns.

Table 14

Descriptive Statistics for Pronoun Use in Anecdotal Comments by Response Wave (N = 566)

	n	*M*	*SD*
Mail1	433	0.15	0.57
Mail2	133	0.16	0.53
Total	566	0.15	0.56

Results using a *t*-test for equal variances (pooled method) revealed no statistically significant difference in total pronoun use by response wave, $t(564) = -0.14$, $p = 0.89$. Thus, the null hypothesis that there is no difference in pronoun use in anecdotal comments by response wave was not rejected at $\alpha \leq 0.05$.

RQ2c: Does a difference exist in item nonresponse by survey mode or response wave?

Table 15 presents descriptive statistics for item nonresponse by survey mode and response wave for all 130 sub-items. Of 880 total respondents, three respondents were removed from the analysis because they skipped question two, which was used to identify the remaining items each respondent was supposed to answer. The item nonresponse range was 0-129 sub-items with a mean of 28.07 ($SD = 42.49$) sub-items skipped. Web1 respondents skipped the greatest number of items ($M = 53.49$, $SD = 55.64$) and Mail1 skipped the least ($M = 14.58$, $SD = 25.13$).

Levene's test indicated heterogeneity of group variances, $F(3, 873) = 117.19$, $p < 0.0001$, so a Welch's ANOVA was used in place of the standard ANOVA. Results using the Welch's ANOVA revealed a statistically significant interaction, $F_{Welch}(3, 209.20) = 41.33$, $p < 0.0001$, prompting analysis of the simple effects. Statistically significant differences were revealed among survey modes for Wave 1, $F_{Welch}(1, 310.40) = 109.75$, $p < 0.0001$, and for Wave 2, $F_{Welch}(1, 77.09) = 14.98$, $p = 0.0002$, but not among response waves for mail, $F_{Welch}(1, 209.70) = 0.49$, $p = 0.48$, or for web, $F_{Welch}(1, 99.70) = 1.76$, $p = 0.19$. Thus, the null hypothesis that there is no difference in item nonresponse by survey

mode or response wave was rejected at $\alpha \leq 0.05$. There were more items skipped among Web1 ($M = 53.49$, $SD = 55.64$) versus Mail1 ($M = 14.58$, $SD = 25.13$) respondents, and more items skipped among Web2 ($M = 43.54$, $SD = 52.64$) versus Mail2 ($M = 16.39$, $SD = 26.26$) respondents.

Table 15

Descriptive Statistics for Item Nonresponse by Survey Mode and Response Wave (N = 880)

	n	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	563	15.01	25.38	15.49	1.92
Web	314	51.50	55.11	48.52	2.73
Response Wave					
Wave 1	682	28.90	43.45	34.04	1.54
Wave 2	195	25.16	38.90	29.97	2.96
Mode x Wave					
Mail1	431	14.58	25.13		
Mail2	132	16.39	26.26		
Web1	251	53.49	55.64		
Web2	63	43.54	52.64		
Total	877	28.07	42.49		

Note: missing = 3 (3 respondents were removed from the analysis because they skipped question two, which was used to identify the remaining skipped items).

Since a nonorthogonal Welch's ANOVA was used, an additional analysis was conducted to check assumptions. Results revealed that skewness = 1.50, the smallest group size = 63, and the ratio of the largest (Web1, $SD = 55.64$) to the smallest (Mail1, $SD = 25.13$) standard deviation = 2.21, all within the recommendations for a robust Welch's ANOVA.

RQ2d: Does a difference exist in response extremity by survey mode or response wave?

Table 16 presents descriptive statistics for response extremity by survey mode and response wave. Mean use of the extreme response option was 19.16 ($SD = 11.49$). Mail1 respondents selected the most extreme responses ($M = 19.78$, $SD = 11.30$) and Web2 selected the least ($M = 17.60$, $SD = 11.86$).

Table 16

Descriptive Statistics for Response Extremity by Survey Mode and Response Wave (N = 880)

	n	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	553	19.58	11.44	19.36	0.58
Web	196	17.98	11.57	17.85	0.99
Response Wave					
Wave 1	576	19.33	11.38	18.94	0.54
Wave 2	173	18.61	11.88	18.27	1.01
Mode x Wave					
Mail1	423	19.78	11.30		
Mail2	130	18.94	11.91		
Web1	153	18.09	11.53		
Web2	43	17.60	11.86		
Total	749	19.16	11.49		

Note: missing = 131.

Levene's test indicated homogeneity of group variances, $F(3, 745) = 0.40$, $p = 0.76$, so a standard two-way ANOVA followed. The ANOVA revealed no statistically significant main effect by survey mode, $F(1, 745) = 1.74$, $p = 0.19$, or by response wave, $F(1, 745) = 0.34$, $p = 0.56$, and no interaction, $F(1, 745) = 0.02$, $p = 0.88$. Thus, the null hypothesis that there is no difference in response extremity by survey mode or response wave was not rejected at $\alpha \leq 0.05$.

RQ2e: Does a difference exist in yea-saying by survey mode or response wave? Table 17 presents descriptive statistics for yea-saying by survey mode and response wave. Mean use of the yes response option was 14.55 ($SD = 9.66$). Web2 respondents selected the most yes responses ($M = 15.43$, $SD = 11.56$) and Mail1 selected the least ($M = 14.22$, $SD = 9.35$).

Levene's test indicated homogeneity of group variances, $F(3, 702) = 2.15$, $p = 0.09$, so a standard two-way ANOVA followed. The ANOVA revealed no statistically significant main effect by survey mode, $F(1, 702) = 1.25$, $p = 0.26$, or by response wave, $F(1, 702) = 0.01$, $p = 0.91$, and no interaction, $F(1, 702) = 0.00$, $p = 0.98$. Thus, the null

hypothesis that there is no difference in yea-saying by survey mode or response wave was not rejected at $\alpha \leq 0.05$.

Table 17

Descriptive Statistics for Yea-Saying by Survey Mode and Response Wave (N = 880)

	n	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	517	14.25	9.49	14.29	0.50
Web	189	15.37	10.09	15.39	0.85
Response Wave					
Wave 1	543	14.52	9.44	14.78	0.47
Wave 2	163	14.63	10.37	14.89	0.87
Mode x Wave					
Mail1	396	14.22	9.35		
Mail2	121	14.36	9.96		
Web1	147	15.35	9.67		
Web2	42	15.43	11.56		
Total	706	14.55	9.66		

Note: missing = 174.

RQ2f: Does a difference exist in item completion errors by survey mode or response wave? Table 18 presents descriptive statistics for item completion errors by survey mode and response wave for both contingency questions 10 and 14.

For question 10 analysis, of 880 total respondents, 52 respondents indicated that they had no special education students on their caseload, but then provided responses to one or more of 70 subsequent sub-items. Mean item completion errors among the 52 respondents with no special education students on their caseload was 8.98 (*SD* = 13.35). Mail1 respondents had the most item completion errors (*M* = 12.36, *SD* = 15.86) and Mail2 had the least (*M* = 2.25, *SD* = 3.54).

Levene's test indicated homogeneity of group variances, $F(3, 48) = 1.95$, $p = 0.13$, so a standard two-way ANOVA followed. The ANOVA revealed no statistically significant main effect by survey mode, $F(1, 48) = 0.07$, $p = 0.80$, or by response wave, $F(1, 48) = 1.33$, $p = 0.25$, and no interaction, $F(1, 48) = 0.78$, $p = 0.38$.

Table 18

Descriptive Statistics for Item Completion Errors for Questions 10 and 14 by Survey Mode and Response Wave (N = 880)

	Question #10 (n = 52)					Question #14 (n = 112)				
	n	*M*	*SD*	M_{Adj}	SE_{Adj}	*n*	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode										
Mail	36	10.11	14.65	7.30	2.64	61	5.79	13.05	4.63	1.59
Web	16	6.44	9.76	6.01	4.21	51	0.84	6.02	0.57	1.68
Response Wave										
Wave 1	41	10.56	14.48	9.52	2.21	85	4.25	11.80	3.95	1.14
Wave 2	11	3.09	4.72	3.79	4.45	27	1.30	5.66	1.25	2.02
Mode by Wave										
Mail1	28	12.36	15.86			47	6.77	14.17		
Mail2	8	2.25	3.54			14	2.50	7.79		
Web1	13	6.69	10.45			38	1.13	6.98		
Web2	3	5.33	7.57			13	0.00	0.00		
Total	52	8.98	13.35			112	3.54	10.70		

For question 14 analysis, of 880 total respondents, 112 respondents selected "no" for question 14, indicating that students on their caseload do not participate in career assessments at some time during their secondary education. These respondents were instructed to skip to section 3, page 7; however, continued to answer one or more of 88 subsequent sub-items in section two. Mean item completion errors among these 112 respondents was 3.54 (*SD* = 10.70). Mail1 respondents had the most item completion errors (*M* = 6.77, *SD* = 14.17) and Web2 had the least (*M* = 0.00, *SD* = 0.00).

Levene's test indicated homogeneity of group variances, $F(3, 108) = 2.18$, $p = 0.10$, so a standard two-way ANOVA followed. The ANOVA revealed no statistically significant main effect by survey mode, $F(1, 108) = 3.08$, $p = 0.08$, or by response wave, $F(1, 108) = 1.36$, $p = 0.25$, and no interaction, $F(1, 108) = 0.46$, $p = 0.50$. Thus, the null hypothesis that there is no difference in item completion errors by survey mode or response wave was not rejected at $\alpha \leq 0.05$ for both question 10 and question 14 analyses.

RQ2g: Does a difference exist in multiple response use by response wave? See Table 19 for descriptive statistics. Mean multiple response use among 564 mail respondents was 2.22 additional responses (*SD* = 4.16).

Table 19

Descriptive Statistics for Multiple Response Use in Mail Surveys by Response Wave (N = 566)

	n	*M*	*SD*
Mail1	432	2.30	4.22
Mail2	132	1.98	3.98
Total	564	2.22	4.16

Note: missing = 2.

Results for equal variances revealed no statistically significant difference in multiple response use by response wave, $t(562) = 0.75$, $p = 0.45$. Thus, the null

hypothesis that there is no difference in multiple response use by response wave was not rejected at $\alpha \leq 0.05$.

RQ2h: Does a difference exist in response length by survey mode or response wave?

Table 20 presents descriptive statistics for response length by survey mode and response wave for all three items. Mean response length was 34.70 words (*SD* = 24.77). Web1 respondents provided the greatest number of words in their responses (*M* = 45.81, *SD* = 38.38) and Mail1 provided the least (*M* = 31.31, *SD* = 18.08).

Table 20

Descriptive Statistics for Response Length by Survey Mode and Response Wave (N = 880)

	n	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	523	31.55	18.71	31.82	1.25
Web	180	43.86	35.65	41.62	2.13
Response Wave					
Wave 1	539	35.02	25.66	38.56	1.19
Wave 2	164	33.63	21.62	34.88	2.16
Mode x Wave					
Mail1	401	31.31	18.08		
Mail2	122	32.33	20.72		
Web1	138	45.81	38.38		
Web2	42	37.43	23.92		
Total	703	34.70	24.77		

Note: missing = 177.

Levene's test indicated heterogeneity of group variances, $F(3, 699) = 12.37$, $p < 0.0001$, so a Welch's ANOVA was used in place of the standard ANOVA. Results using the Welch's ANOVA revealed a statistically significant interaction, $F_{Welch}(3, 144.10) = 6.65$, $p = 0.0003$, prompting analysis of the simple effects. A statistically significant difference was revealed among survey modes for Wave 1, $F_{Welch}(1, 158.40) = 18.31$, $p < 0.0001$, but not for Wave 2, $F_{Welch}(1, 63.47) = 1.52$, $p = 0.22$, and not among response waves for mail, $F_{Welch}(1, 180.60) = 0.24$, $p = 0.63$, or for web, $F_{Welch}(1, 101.10) = 2.89$, $p = 0.09$. Thus, the null hypothesis that there is no difference in response length by survey

mode or response wave was rejected at $\alpha \leq 0.05$. Response length was greater among Web1 ($M = 45.81$, $SD = 38.38$) compared to Mail1 ($M = 31.31$, $SD = 18.08$) respondents.

Since a nonorthogonal Welch's ANOVA was used, an additional analysis was conducted to check assumptions. Results revealed that skewness = 2.58, the smallest group size = 42, and the ratio of the largest (Web1, $SD = 38.38$) to the smallest (Mail1, $SD = 18.08$) standard deviation = 2.12. Thus, the skewness exceeded the recommendations for a robust Welch's ANOVA, prompting a secondary analysis using data transformed by square root. Results revealed that skewness = 0.97, the smallest group size = 42, and the ratio of the largest (Web1, $SD = 2.48$) to the smallest (Mail1, $SD = 1.57$) standard deviation = 1.17, all within the recommendations for a robust Welch's ANOVA. Descriptive statistics are presented in Table 21.

Table 21

Descriptive Statistics for the Square Root of Response Length by Survey Mode and Response Wave (N = 880)

	n	*M*	*SD*	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	523	5.39	1.59	5.40	0.09
Web	180	6.19	2.35	6.07	0.16
Response Wave					
Wave 1	539	5.61	1.89	5.84	0.09
Wave 2	164	5.54	1.72	5.64	0.16
Mode x Wave					
Mail1	401	5.37	1.57		
Mail2	122	5.43	1.68		
Web1	138	6.30	2.48		
Web2	42	5.85	1.82		
Total	703	5.59	1.85		

Note: missing = 177.

Levene's test using the square root of the response length indicated heterogeneity of group variances, $F(3, 699) = 12.70$, $p < 0.0001$, so a Welch's ANOVA was used in place of the standard ANOVA. Results using the Welch's ANOVA revealed a statistically significant interaction, $F_{Welch}(3, 148.20) = 6.18$, $p = 0.001$, prompting analysis of the

simple effects. A statistically significant difference was revealed among survey modes for Wave 1, $F_{Welch}(1, 176.00) = 16.97$, $p < 0.0001$, but not for Wave 2, $F_{Welch}(1, 66.49) = 1.66$, $p = 0.20$, and not among response waves for mail, $F_{Welch}(1, 189.80) = 0.13$, $p = 0.71$, or for web, $F_{Welch}(1, 91.63) = 1.66$, $p = 0.20$. The square root of the response length was greater among Web1 ($M = 6.30$, $SD = 2.48$) compared to Mail1 ($M = 5.37$, $SD = 1.57$) respondents. Although the second analysis used data transformed by square root and the first analysis didn't, the results of the two analyses were consistent. Thus, the hypothesis that there is no difference in response length by survey mode or response wave was rejected at $\alpha \leq 0.05$.

RQ2i: Does a difference exist in the response length of anecdotal comments by response wave? See Table 22 for descriptive statistics for response length in anecdotal comments by survey mode and response wave. Respondents had a response length range of 0-64 words with a mean response length of 4.12 words ($SD = 9.29$).

Table 22

Descriptive Statistics for Response Length in Anecdotal Comments by Response Wave (N = 566)

	n	*M*	*SD*
Mail1	433	4.09	9.64
Mail2	133	4.23	8.09
Total	566	4.12	9.29

Results for unequal variances (Satterthwaite method) revealed no statistically significant difference in response length by response wave, $t(257) = -0.16$, $p = 0.87$. Thus, the null hypothesis that there is no difference in response length in anecdotal comments by response wave was not rejected at $\alpha \leq 0.05$.

RQ2j: Does a difference exist in response equivalency by survey mode or response wave?

Table 23 presents descriptive statistics for response extremity by survey mode and response wave. The mean response score among respondents who responded to at least

one of the 20 sub-items (n = 700) was 4.34 (SD = 0.84). The mean score in all conditions is between the 51-75% and 76-100% categories. Mail1 respondents provided the highest mean score (M = 4.39, SD = 0.80) and Web1 provided the lowest (M = 4.26, SD = 0.92).

Table 23

Descriptive Statistics for Response Equivalency by Survey Mode and Response Wave (N = 880)

	n	M	SD	M_{Adj}	SE_{Adj}
Survey Mode					
Mail	521	4.37	0.81	4.35	0.04
Web	179	4.27	0.92	4.27	0.07
Response Wave					
Wave 1	536	4.36	0.83	4.33	0.04
Wave 2	164	4.30	0.86	4.29	0.08
Mode x Wave					
Mail1	399	4.39	0.80		
Mail2	122	4.31	0.84		
Web1	137	4.26	0.92		
Web2	42	4.28	0.93		
Total	700	4.34	0.84		

Note: missing = 180.

Levene's test indicated homogeneity of group variances, $F(3, 696) = 1.04$, $p = 0.37$, so a standard two-way ANOVA followed. The ANOVA revealed no statistically significant main effect by survey mode, $F(1, 696) = 0.73$, $p = 0.39$, or by response wave, $F(1, 696) = 0.14$, $p = 0.71$, and no interaction, $F(1, 696) = 0.35$, $p = 0.56$. Thus, the null hypothesis that there is no difference in response extremity by survey mode or response wave was not rejected at $\alpha \leq 0.05$.

RQ2 Summary. Results revealed that there were no differences in pronoun use, pronoun use in anecdotal comments, response extremity, yea-saying, item completion errors, multiple response use, response length in anecdotal comments, and response equivalency by survey mode or response wave and there were. Significant differences were revealed in item nonresponse by survey mode at Wave 1 and by survey mode at Wave 2, but not by response wave for mail surveys or by response wave for web surveys. Web1 respondents

had greater item nonresponse (M = 53.49, SD = 55.64) than Mail 1 (M = 14.58, SD = 25.13) and Web2 had greater item nonresponse (M = 43.54, SD = 52.64) than Mail2 (M = 16.39, SD = 26.26). A significant difference was also revealed for response length by survey mode at Wave 1, but no differences were revealed for survey mode at Wave 2, response wave for mail, or response length for web. Using data transformed by square root, Web1 respondents had greater response length (M = 6.30, SD = 2.48) than Mail1 (M = 5.37, SD = 1.57). See Table 24 for a summary of the results for research question two.

RQ2 Supplemental Analysis. A supplemental analysis was conducted using t-tests on the variables in RQ2b (pronoun use in anecdotal comments), RQ2g (multiple response use), and RQ2i (response length in anecdotal comments) to determine if instances of these variables were statistically different than zero (h0=0 option in SAS proc ttest). Results revealed that each of these was statistically different than zero: pronoun use in anecdotal comments, $t(565) = 6.42$, $p < 0.0001$; multiple response use, $t(563) = 12.69$, $p < 0.0001$; and response length in anecdotal comments, $t(565) = 10.55$, $p < 0.0001$.

Research Question Three

Research question three (RQ3) was: "Do demographic characteristics and response quality predict survey mode or response wave?" The research sub-questions were:

a) Do demographic characteristics and response quality predict survey mode?

b) Do demographic characteristics and response quality predict response wave?

Table 24

Summary of Results for Research Question Two

Variable	Statistical Test	Test Results	Conclusion
Pronoun Use	ANOVA, mode main effect	$F(1, 876) = 1.23$, $p = 0.27$	
	ANOVA, wave main effect	$F(1, 876) = 2.27$, $p = 0.13$	No differences
	ANOVA, mode x wave interaction	$F(1, 876) = 0.03$, $p = 0.86$	
Pronoun Use in Anecdotal Comments	Two-tailed *t*-test, Mail1 x Mail2, Pooled Procedure	$t(564) = -0.14$, $p = 0.89$	No difference
Item Nonresponse	Welch ANOVA, mode x wave interaction	$F_{Welch}(3, 209.20) = 41.33$, $p < 0.0001$	Significant interaction
	Welch ANOVA, mode @ wave 1	$F_{Welch}(1, 310.40) = 109.75$, $p < 0.0001$	Web1 > Mail1 ($M = 53.49$, $SD = 55.64$) > ($M = 14.58$, $SD = 25.13$)
	Welch ANOVA, mode @ wave 2	$F_{Welch}(1, 77.09) = 14.98$, $p = 0.0002$	Web2 > Mail2 ($M = 43.54$, $SD = 52.64$) > ($M = 16.39$, $SD = 26.26$)
	Welch ANOVA, wave @ mail	$F_{Welch}(1, 209.70) = 0.49$, $p = 0.48$	No difference
	Welch ANOVA, wave @ web	$F_{Welch}(1, 99.70) = 1.76$, $p = 0.19$	No difference
Response Extremity	ANOVA, mode main effect	$F(1, 745) = 1.74$, $p = 0.19$	
	ANOVA, wave main effect	$F(1, 745) = 0.34$, $p = 0.56$	No differences
	ANOVA, mode x wave interaction	$F(1, 745) = 0.02$, $p = 0.88$	
Yea-Saying	ANOVA, mode main effect	$F(1, 702) = 1.25$, $p = 0.26$	
	ANOVA, wave main effect	$F(1, 702) = 0.01$, $p = 0.91$	No differences
	ANOVA, mode x wave interaction	$F(1, 702) = 0.00$, $p = 0.98$	
Item Completion Errors (Question 10)	ANOVA, mode main effect	$F(1, 48) = 0.07$, $p = 0.80$	
	ANOVA, wave main effect	$F(1, 48) = 1.33$, $p = 0.25$	No differences
	ANOVA, mode x wave interaction	$F(1, 48) = 0.78$, $p = 0.38$	
(Question 14)	ANOVA, mode main effect	$F(1, 108) = 3.08$, $p = 0.08$	
	ANOVA, wave main effect	$F(1, 108) = 1.36$, $p = 0.25$	No differences
	ANOVA, mode x wave interaction	$F(1, 108) = 0.46$, $p = 0.50$	

Table Continued

Table 24 (continued)

Variable	Statistical Test	Test Results	Conclusion
Multiple Response Use	Two-tailed *t*-test, Mail1 x Mail2	$t(562) = 0.75$, $p = 0.45$	No difference
Response Length	Welch ANOVA, mode x wave interaction	$F_{Welch}(3, 144.10) = 6.65$, $p = 0.0003$	Significant interaction
	Welch ANOVA, mode @ wave 1	$F_{Welch}(1, 158.40) = 18.31$, $p < 0.0001$	Web1 > Mail1 ($M = 45.81$, $SD = 38.38$) > ($M = 31.31$, $SD = 18.08$)
	Welch ANOVA, mode @ wave 2	$F_{Welch}(1, 63.47) = 1.52$, $p = 0.22$	No difference
	Welch ANOVA, wave @ mail	$F_{Welch}(1, 180.60) = 0.24$, $p = 0.63$	No difference
	Welch ANOVA, wave @ web	$F_{Welch}(1, 101.10) = 2.89$, $p = 0.09$	No difference
Response Length (data transformed by square root)	Welch ANOVA, mode x wave interaction	$F_{Welch}(3, 148.20) = 6.18$, $p = 0.001$	Significant interaction
	Welch ANOVA, mode @ wave 1	$F_{Welch}(1, 176.00) = 16.97$, $p < 0.0001$	Web1 > Mail1 ($M = 6.30$, $SD = 2.48$) > ($M = 5.37$, $SD = 1.57$)
	Welch ANOVA, mode @ wave 2	$F_{Welch}(1, 66.49) = 1.66$, $p = 0.20$	No difference
	Welch ANOVA, wave @ mail	$F_{Welch}(1, 189.80) = 0.13$, $p = 0.71$	No difference
	Welch ANOVA, wave @ web	$F_{Welch}(1, 91.63) = 1.66$, $p = 0.20$	No difference
Response Length in Anecdotal Comments	Two-tailed *t*-test, Mail1 x Mail2, Satterthwaite Procedure	$t(257) = -0.16$, $p = 0.87$	No difference
Response Equivalency	ANOVA, mode main effect	$F(1, 696) = 0.73$, $p = 0.39$	No differences
	ANOVA, wave main effect	$F(1, 696) = 0.14$, $p = 0.71$	
	ANOVA, mode x wave interaction	$F(1, 696) = 0.35$, $p = 0.56$	

Table 25 presents a summary of basic descriptive statistics for all of the variables included in the logistic regression models. For detailed statistics, descriptions, and behaviors of these variables by survey mode and response wave, see the descriptive statistics tables and analyses for research questions one and two earlier in this chapter as the variables selected as predictors in this analysis are the same variables as used to answer research questions one and two.

Table 25

Descriptive Statistics for Variables Used in Logistic Regression Models

Variable	Description	*n*	*M*	*SD*
Gender	0 = Male, 1 = Female	737	0.75	0.43
Ethnicity	0 = Nonwhite, 1 = White	728	0.86	0.34
Survey Mode	0 = Mail, 1 = Web	880	0.36	0.48
Response Wave	0 = Wave 1, 1 = Wave 2	880	1.22	0.42
Age	Range 25 - 73 years	707	47.82	10.32
Profess. Employment	Range 1 - 43 years	806	18.58	10.08
Pronoun Use	Range 0 – 7 pronouns	880	0.31	0.86
Item Nonresponse	Range 0 – 129 items skipped	877	28.07	42.49
Response Extremity	Range 0 – 44 extreme responses	749	19.16	11.49
Yea Saying	Range 0 – 38 yes responses	706	14.55	9.66
Response Length	Range (square root) 1.41 – 14.90 words	703	5.59	1.85
Response Equivalency	2 = 1-25%, 3 = 26-50%, 4 = 51-75%, 5 = 76-100%	700	4.34	0.84

Table 26 presents Pearson Product Moment correlations between continuous predictor variables. An examination of correlations among eight continuous predictor variables revealed three variable pairs correlated at $p \leq 0.05$ and eight pairs correlated at $p \leq 0.01$.

Table 26

Pearson Correlations Between Continuous Predictor Variables (N = 880)

Variable	1 Age	2 Years Employment	3 Pronoun Use	4 Item Nonresponse	5 Response Extremity	6 Yea-Saying	7 Response Length	8 Response Equivalency
1. Age		0.67**	0.05	0.05	0.01	-0.07	0.07	0.05
2. Years Employment			0.05	-0.02	0.01	-0.08*	-0.01	0.08*
3. Pronoun Use				-0.14**	-0.04	-0.03	0.55**	-0.03
4. Item Nonresponse					-0.29**	-0.11**	-0.09*	-0.03
5. Response Extremity						0.17**	-0.03	0.71**
6. Yea-Saying							-0.02	0.11**
7. Response Length								-0.02

*$p \leq 0.05$, **$p \leq 0.01$.

RQ3a: Do demographic characteristics and response quality predict survey mode? Of 880 respondent observations, 565 were retained in the model (missing = 315). All 11 predictors were entered into the model predicting survey mode, with mail coded as zero and web coded as one. The probability modeled was the mail survey mode, (using event = '0' on the left side of the model statement in SAS proc logistic). Prior to the first step in the stepwise logistic regression analysis, the intercept-only model was fitted, Wald χ^2 (1, N = 565) = 129.86, $p < 0.0001$. See Table 27 for initial model estimates.

Table 27

Analysis of Effects Prior to Entry into the Logistic Regression Model Predicting Mail Survey Mode, All Predictors Included

Effect	*df*	Score χ^2	*p*
Response Wave (Wave 1 = 0, Wave 2 = 1)	1	0.29	0.59
Gender (Male = 0, Female = 1)	1	3.03	0.08
Ethnicity (Nonwhite = 0, White = 1)	1	2.00	0.16
Age	1	24.84	<.0001
Professional Employment	1	13.30	0.0003
Pronoun Use	1	9.75	0.0018
Item Nonresponse	1	1.63	0.20
Response Extremity	1	0.76	0.38
Yea-Saying	1	5.46	0.02
Response Length (square root)	1	13.35	0.0003
Response Equivalency	1	0.61	0.43

In step one, the model with intercept and age was significant, Wald χ^2 (1, N = 565) = 23.83, $p < 0.0001$, and age was not removed. In step two, response length was added. In the model with intercept, age and response length, both predictors were significant, $p < 0.0001$, and neither predictor was removed. In step three, gender was added to the model: intercept, age ($p < 0.0001$), response length ($p < 0.0001$), and gender ($p = 0.01$), and all met the criterion of 0.40 to stay in the model. In step four, yea-saying was added to the model: intercept, age ($p < 0.0001$), response length ($p < 0.0001$), gender ($p = 0.01$), and yea-saying ($p = 0.05$) and none was removed. In step five, ethnicity was

added to the model: intercept, age ($p < 0.0001$), response length ($p < 0.0001$), gender ($p = 0.01$), yea-saying ($p = 0.03$), and ethnicity ($p = 0.09$) and none was removed. In step six, response extremity was added to the model: intercept, age ($p < 0.0001$), response length ($p < 0.0001$), gender ($p = 0.01$), yea-saying ($p = 0.01$), ethnicity ($p = 0.06$), and response extremity ($p = 0.13$) and none was removed. None of the remaining variables met the criterion of 0.15 for entry into the model, so the stepwise selection was terminated.

Table 27 presents a summary of the final stepwise logistic regression model predicting the mail survey mode. Four of the six variables retained in the final model reached the level of significance for this study: age, response length, gender and yea-saying. Response wave, ethnicity, professional employment, pronoun use, item nonresponse, response extremity, and response equivalency were not significant predictors. Using parameter estimates from Table 28, the prediction equation for the log of returning a mail survey is: 0.28 + 0.05(Age) - 0.25(Response Length) + 0.58(Gender) - 0.03(Yea-Saying). Inserting the values of each variable into this equation produces the log (odds) predicting a mail survey.

The odds ratio (OR) for age indicates that when holding all other variables constant, the probability that a respondent will self-select a mail survey increases 1.06 times for every one unit increase in age. The OR for response length indicates that when holding all other variables constant, the probability that a respondent will self-select a mail survey decreases by 22% for every unit increase in response length, e.g., an OR of 0.78. In other words, an increasing response length is associated with decreasing odds of self-selecting a mail survey. The OR of 1.79 for gender, coded as male = 0 and female = 1, indicates that when holding all other variables constant, females are more 1.79 times more likely than males to self-select a mail survey. The OR for yea-saying indicates that

Table 28

Final Logistic Regression Model Predicting Mail Survey Mode from Age, Response Length, Gender, Yea-Saying, Ethnicity, and Response Extremity

Predictor	β	*SE*	Wald χ^2	df	*p*	Odds Ratio	Confidence Intervals	
							Lower Bound	Upper Bound
Intercept	0.28	0.71	0.16	1	0.69	1.33		
Age	0.05	0.01	26.66	1	< 0.0001	1.06	1.03	1.08
Response Length	-0.25	0.06	19.25	1	< 0.0001	0.78	0.69	0.87
Gender (Male = 0, Female = 1)	0.58	0.23	6.29	1	0.01	1.79	1.14	2.82
Yea-Saying	-0.03	0.01	5.96	1	0.01	0.97	0.95	1.00
Ethnicity (Nonwhite = 0, White = 1)	-0.66	0.35	3.50	1	0.06	0.52	0.26	1.03
Response Extremity	0.01	0.01	2.31	1	0.13	1.02	1.00	1.03

Note: Predictors are listed in the order in which each was entered into the model. Confidence Limits are 95% Wald confidence intervals for adjusted odds ratios.

when holding all other variables constant, the probability that a respondent will self-select a mail survey decreases about 3% for every unit increase in yea-saying, e.g., an OR of 0.97. In other words, as yea-saying increases, the odds of self-selecting a mail survey decrease.

Model fit statistics were used to examine how well the model fit the data. A Likelihood Ratio test of the full model versus the null model was statistically significant, χ^2 (6, N = 565) = 56.73, $p < 0.0001$, and accounted for approximately 14% of the variance (Nagelkerke $R^2 = 0.14$) associated with whether or not a respondent returned a mail or a web survey. Results of the Hosmer-Lemeshow goodness-of-fit test revealed no evidence of a lack of fit for the final model, χ^2 (8, N = 565) = 5.46, $p = 0.71$.

RQ3b: Do demographic characteristics and response quality predict response wave? Of 880 respondent observations, 565 were retained in the model (missing = 315). All 11 predictors were entered into the first model predicting response wave, with Wave 1 coded as zero and Wave 2 coded as one. The probability modeled was the Wave 1 response wave. Prior to the first step in the stepwise logistic regression analysis, the intercept-only model was fitted, Wald χ^2 (1, N = 565) = 165.60, $p < 0.0001$. See Table 29 for initial model estimates. No predictors obtained the level required for entry into the model, thus the stepwise selection procedure terminated.

Table 29

Analysis of Effects Prior to Entry into the Logistic Regression Model Predicting Wave 1, All Predictors Included

Effect	*df*	Score χ^2	*p*
Survey Mode (Mail = 0, Web = 1)	1	0.29	0.59
Gender (Male = 0, Female = 1)	1	1.13	0.29
Ethnicity (Nonwhite = 0, White = 1)	1	0.37	0.54
Age	1	0.18	0.67
Professional Employment	1	0.00	1.00
Pronoun Use	1	0.08	0.78
Item Nonresponse	1	1.45	0.23
Response Extremity	1	0.00	0.97
Yea-Saying	1	0.43	0.51
Response Length (square root)	1	0.39	0.53
Response Equivalency	1	0.15	0.70

RQ3 Summary. Results revealed that age and gender had significant positive partial effects while response length and yea-saying had significant negative partial effects in predicting mail survey mode. No variables predicted response wave.

CHAPTER V

DISCUSSION

Chapter 5 begins with a summary and discussion of the findings from this study. This section reviews the results presented in Chapter 4 in the context of the field of survey research as presented in the literature. Second, the study's limitations are addressed. Finally, the study's practical implications and recommendations for further research are presented.

The purpose of this nonexperimental, quantitative study was to examine differences in demographics and response quality among mail and web surveys and two data collection cycles when respondents self-select the survey mode. This study was designed to contribute knowledge to the field regarding differences in demographics and response quality between mail and web surveys, web and mail mixed-mode designs using simultaneous mode delivery, differences between early and late responders, and mode self-selection.

Results revealed that mail respondents were older and had more years of professional employment than web respondents, item nonresponse was greater in web than in mail surveys, and response length was greater in web versus mail surveys at Wave 1. Age, gender, response length, and yea-saying had significant partial effects in predicting the mail survey mode. No differences in survey mode or response wave were observed for gender, ethnicity, pronoun use, response extremity, yea-saying, item completion errors, and response equivalency. No differences by response wave were observed in pronoun use and response length for anecdotal comments and in multiple response use; however, each of these three variables was statistically different than zero.

Finally, no variables were observed to predict response wave. The next section summarizes key findings in the context of the literature.

Response Rate

Total survey response rate was 35.69% (n = 1,028) and the adjusted response rate was 30.56% (n = 880). The survey mode response rate was 64.32% (n = 566) for the mail mode versus 35.68% (n = 314) for the web mode. The response wave response rate was 77.73% (n = 684) for Wave 1 versus 22.27% (n = 196) for Wave 2. Results revealed no differences between actual and expected response rates in a mode by wave chi-square comparison, but a goodness-of-fit chi-square (using 25% and n = 220 for each cell) revealed over-representation in both survey modes at Wave 1 and under-representation in both modes at Wave 2.

The survey mode response rate distribution was consistent with the literature (Kiesler & Sproull, 1986; Shih & Fan, 2007b; Underwood et al., 2000), even among studies involving mode self-selection and mail mode initial contacts (Shih & Fan, 2007b). The finding of no statistically significant difference between survey modes was consistent with Jun's (2005) survey about health behaviors among 1,000 undergraduate university students. Regarding response wave, although the two response waves comprised approximately the same length of time, the finding of over-representation in Wave 1 and under-representation in Wave 2 was expected given that Wave 1 included the initial contact and first three reminders, whereas Wave 2 comprised only the fourth reminder. It is typically accepted in the survey research field that most respondents will respond during the initial and first follow-up phases of data collection (Dillman, 2000).

Discussion of Research Questions

Research Question One

Research question one was, "Does a difference exist in demographic characteristics by survey mode or response wave?" The majority of respondents in each of the four respondent groups as well as for the overall sample were female (n = 553, 75.03%) and White (n = 629, 86.40%), with a mean age of 47.82 years (SD = 10.32) and a mean of 18.58 years (SD = 10.08) of professional employment. Results revealed no differences in gender and ethnicity by survey more or response wave; however, both age and professional employment differed by survey mode but not by response wave. Mail respondents were older and had more years of professional experience than web respondents.

The gender distribution was consistent with the literature for mail and electronic surveys (Ayers, 2004; Borkan, 2006; McCabe et al., 2002; Witte et al., 2000) as well as for surveys involving school counselors in particular (Berry, 2006; Fitch & Marshall, 2004; Fritz, 2004; Ruebensaal, 2006; Young, 2004). The nonsignificant findings for gender and ethnicity by survey mode were consistent with the literature (Borkan, 2006; Hayslett & Wildemuth, 2004; Kiesler & Sproull, 1986). The findings for age were consistent with four studies (Kaufman et al., 1997; Palmquist & Stueve, 1996; Schmidt, 1997; Zhang, 2000) and professional employment findings were consistent with Kim et al. (2000) and Hollowell et al. (2000). Findings suggest that mail and web surveys provided similar coverage for gender and ethnicity. Given the survey mode differences in age and professional experience, however, the mail and web mixed-mode design may provide coverage to a wider age and professional experience range than using either of

the two modes separately. Carrying the data collection cycle into the new school year appeared to have no effect on demographics.

Research Question Two

Research question two was, "Does a difference exist in response quality by survey mode or response wave?" Results revealed that there were no differences in pronoun use, response extremity, yea-saying, item completion errors, and response equivalency by survey mode or response wave. There were also no differences in pronoun use in anecdotal comments, multiple response use, and response length in anecdotal comments in mail surveys by response wave. Supplemental analysis revealed that pronoun use in anecdotal comments, multiple response use, and response length in anecdotal comments was each statistically different than zero.

Significant differences were revealed in item nonresponse by survey mode at Wave 1 and by survey mode at Wave 2, but not by response wave for mail surveys or by response wave for web surveys. Web1 respondents had greater item nonresponse (M = 53.49, SD = 55.64) than Mail 1 (M = 14.58, SD = 25.13) and Web2 had greater item nonresponse (M = 43.54, SD = 52.64) than Mail2 (M = 16.39, SD = 26.26). A significant difference was also revealed for response length by survey mode at Wave 1, but no differences were revealed for survey mode at Wave 2, response wave for mail, or response length for web. Using data transformed by square roots, Web1 respondents had greater response length (M = 6.30, SD = 2.48) than Mail1 (M = 5.37, SD = 1.57).

Findings confirmed studies in the literature for pronoun use (Kiesler & Sproull, 1986), response extremity (Booth-Kewley et al., 1992; Dillman et al., 2001; Helgeson & Ursic, 1989; Kiesler & Sproull, 1986; Naemi, 2006; Petit, 2002), response equivalency (Bachmann et al., 1996; Booth-Kewley, et al., 1992; Hayslett & Wildemuth, 2004;

Helgeson & Ursic, 1989; Kiesler & Sproull, 1986; Mehta & Sividas, 1995; Pettit, 2002), yea-saying (Kiesler & Sproull, 1986; Weijters et al., 2004), and item completion errors (Kiesler & Sproull, 1986; Pealer, 1999; Smee & Brennan, 2000). Given the current study's findings in the context of other studies, one may expect no survey mode differences in pronoun use, response extremity, yea-saying, item completion errors, and response equivalency in studies with similar populations and circumstances as the current study. Additionally, one may expect no response quality differences among early and late responders.

Findings regarding item completion errors were not significantly different by mode or wave; however, their presence in all response conditions may still reduce data quality. Results of the question 10 analysis for this variable revealed that 52 of 880 respondents (6%) provided a mean of 8.98 (SD = 13.35) responses that should not have been included in data analysis based on their response to question 10. Results of the question 14 analysis revealed that 112 of 880 respondents (13%) provided a mean of 3.54 responses that would not have been included in data analysis if respondents had correctly followed branching and skip instructions. The presence of a substantial number of responses where they should not exist may influence a study's findings. Applying rules to "clean" the data to remove invalid responses, however, may invoke ethical concerns. Reducing the problem before it occurs may be the best solution. Regardless of the survey mode, suggestions to reduce item completion errors include designing appropriate items and instructions, using cognitive interviewing to understand how respondents interpret items and instructions, and pilot-testing questionnaires (Dillman, 2000).

Findings from supplemental analyses regarding anecdotal comments and multiple response use suggest that although no differences were observed by response wave, these

variables may add substantial value to understanding mode effects and interpreting survey findings. Thus, they are worthy of capturing and analyzing. Multiple response use, in particular, may influence comparisons between mail and web survey data. While web surveys can use radio buttons to prevent web respondents from providing multiple responses where they are not expected, mail surveys cannot. As a result, rules may need to be applied to mail survey data to determine which response to keep and which to disregard. Applying such rules to "clean" the data may influence or change results. Additionally, applying such rules to one mode and not to the other reduces comparability and equivalence between the two. Future studies comparing parallel mail and web modes should include ways to capture and analyze anecdotal comments and multiple response use in web modes where possible. In the web mode, text boxes may be strategically placed throughout the questionnaire to capture anecdotal comments. In the mail mode, clearer directions and better item structuring may reduce multiple response use.

Findings regarding item nonresponse contradicted studies showing the same (Pealer, 1999) or lower item nonresponse in web versus mail surveys (Kerwin et al., 2006; Kiesler & Sproull, 1986; MacElroy, Mikuski, & McDowell, 2002; Schaefer & Dillman, 1998; Stanton, 1998; Truell et al., 2002); however, supported three studies that observed higher item nonresponse in web surveys (Ahlstrom, 2004; Smee & Brennan, 2000; Jun 2005). It is assumed that the inconsistent findings for this variable are due in part to differences in the variety of automated error-checking features used in the web survey mode. For example, Kerwin et al. (2006) observed substantially lower item nonresponse in the web versus the mail survey because their web version included an automated feature that informed respondents of the number of incomplete items. Respondents were then given the option to return to complete those items before

submitting the survey. Although some of the studies reporting lower item nonresponse in the web surveys suggest that their mail and web surveys were identical, they provide little or no information about the automated features used in the web mode for a reader to make a valid comparison (e.g., Kiesler & Sproull, 1986; MacElroy, Mikuski, & McDowell, 2002; Truell et al., 2002).

In contrast, Jun (2005) reported higher item nonresponse in the web survey, noting that a substantial number of dropouts were observed among web respondents after completing the first page, whereas mail respondents who did not complete their surveys were not likely to mail them in. This study used no automated features in the web mode to ensure that the mail and web formats were as parallel as possible. Smee and Brennan (2000) conducted a survey using the following parallel mail and web formats: mail, a single web page with no automated features, a multi-page web survey with automated branching and no error-checking, and a multi-page web survey with automated branching and error-checking requiring respondents to fix their response errors. They observed more item nonresponse in all of the web modes compared to the mail mode, noting that it appeared to be easier to abandon a web versus a mail survey. They also observed that the use of the multi-page web survey with automated branching and response validation produced the highest number of partially completed questionnaires compared to the other formats. The latter format prolonged a respondent's time to complete the survey due to the error-checking features as well as the larger file size which required more time for the page to load.

The web mode in the current study used no error-checking and minimal automated branching features. In addition, web respondents were assigned an identification number and counted as a respondent immediately upon accessing the

survey's main page. Use of the final page's "submit" button could not be tracked, so it's possible that some web surveys were abandoned before the respondent clicked the "submit" button. Given the current study's findings in the context of other studies, one may expect that item nonresponse will be higher in web surveys in studies with similar populations and circumstances as the current study when automated features are not used and possibly when automated features become burdensome. Future studies comparing parallel mail and web modes should carefully examine the influence of automated features on item nonresponse to advance the field's understanding of this phenomenon. Such studies should also provide detailed descriptions of the automated features used so readers can make informed comparisons among studies. Future studies should also track use of the final "submit" button to distinguish completed versus abandoned web surveys.

The current study's finding of greater response length in web versus mail surveys is consistent with the literature (Kiesler & Sproull, 1986; MacElroy et al., 2002; Nicholls et al., 1997; Schaefer & Dillman, 1998; Wu, 1997). No studies were found that observed higher response length in mail versus web modes. Given the current study's findings in the context of other studies, one may expect that response length will be higher in web versus mail surveys in studies with similar populations and circumstances as the current study.

Research Question Three

Research questions three was, "Do demographic characteristics and response quality predict survey mode or response wave?" Results revealed that increasing age, gender = female, shorter response length, and less yea-saying behavior predicted an increased likelihood that a respondent self-selected the mail survey mode. No variables predicted response wave. Researchers must carefully consider the effects of these

variables when designing mail and web surveys with mode self-selection. In studies involving mode self-selection, using a mail and web mixed-mode survey design may permit a researcher to realize the added value of a web survey's greater response length as well as the expanded demographic coverage that the two combined provide.

Response Wave

No differences were revealed among demographics or response quality by response wave. This finding supports research reporting no differences in a variety of demographic and response quality variables between early and late responders (Bostick et al., 1992; Fraze, 1986; Gillispie, 1997; Goudy, 1976; Irani et al., 2004; Sobal & Ferentz, 1989), but contradicts one study reporting differences in demographics (Dallosso et al., 2003). This contradiction may be due to a topic's relevance to specific groups in a population. Dallosso et al.'s (2003) study of incontinence and urinary symptoms among a randomly selected sample of 1,050 participants age 40 or older compared the demographics of early and late responders. Results revealed that women were less likely to be late responders (OR 0.88, 95% CI 0.81–0.96), South Asians were more likely to be late responders than Caucasians (OR 1.92, 95% CI 1.66–2.22), and the likelihood of late response decreased with age (OR 0.99, 95% CI 0.98–0.99) (Dallosso et al., 2003).

In the current study, it was assumed that the survey topic (school counselor work settings, caseloads and activities) was equally relevant to all school counselors in the population. Findings suggest that there were no adverse effects produced among the study variables by carrying survey data collection into the beginning of the new school year.

Implications

Given the nonexperimental nature of the study design, external validity (generalizability) is limited; however, the study is important for the following purposes:

(a) Findings are valuable to inform future studies for which time and resource constraints prevent the use of experimental designs; (b) Substantial details regarding methods, analysis, and web survey features used in the current study will help readers make informed comparisons with similar studies; (c) No mode differences in pronoun use, response extremity, yea-saying, item completion errors, or response equivalency, suggesting that response quality is similar among mail and web surveys for these characteristics; (d) Age and professional employment differences by mode suggest that the two modes are not representing the same populations on these variables. Thus, future web and mail surveys must be designed with sensitivity to age and professional employment demographics; and (e) Though the web survey had greater item nonresponse than the mail survey, it had greater response length. Research has shown that automated features in the web survey interface can be programmed to effectively reduce item nonresponse, thus overcoming this shortfall. Given the web survey's comparability to mail surveys in pronoun use, response extremity, yea-saying, item completion errors, or response equivalency, it's added value of producing greater response length, and its other benefits (speed, lower comparative costs and resources, automated data entry), web surveys can be very advantageous as a means to collect survey data alone or in a mixed mail-web design.

Limitations

Findings should be interpreted within the context of limitations regarding the study's nonexperimental design, assumptions about respondents' access to the web survey, and web management issues. Regarding the design, this study used a nonexperimental design with nonrandom sampling, survey mode self-selection, and no reliability analysis. These factors limit generalizability beyond the participants, setting,

survey mode, and other circumstances specific to this study. Regarding web access, initial contact inviting participation was delivered in the mail survey mode. Thus, web survey respondents had to take the extra initiative to locate a computer, connect to the Internet, and type in the URL address to access the web survey. It's assumed that web respondents completed their surveys using computers with the appropriate hardware, software, settings, and Internet connectivity for the survey to load, display, function, and submit correctly. It's also assumed that web respondents were sufficiently computer literate to locate the survey web site, navigate within a web page, provide responses using a keyboard, and submit the survey electronically. Regarding web survey management, web respondents were assigned an identification number and counted as a respondent immediately upon accessing the survey's main page. Use of the final page's "submit" button could not be tracked, so it's possible that some web surveys were abandoned before the respondent clicked the "submit" button.

Recommendations

The purpose of this study was to examine differences in demographics and response quality between survey mode and response wave when mode self-selection is used. Its findings contribute new information to the growing field of survey research and practice.

Use an Experimental Design

Further research should conduct a similar study using an experimental design. Such a design would include random sampling, random assignment of participants to groups (including a control group), random assignment of groups to conditions, and controlled extraneous variables. Experimental groups for the web survey mode could compare the web formats by varying the automated features such as those suggested by

Smee and Brennan (2000): a single web page with no automated features, a multi-page web survey with automated branching and no error-checking, and a multi-page web survey with automated branching and error-checking requiring respondents to fix their response errors. Conditions of respondent mode self-selection could also be varied as well as conditions of sequential versus simultaneous mail and web mixed-mode conditions. Switching modes in follow-up contacts (e.g., sequential method) has been shown to improve response rates over some simultaneous designs (Dillman et al., 1984; Paxson, Dillman, & Tarnai, 1995; Schonlau et al., 2002; Shettle & Mooney, 1999). This research could be expanded to include an analysis of demographics and response quality under these circumstances. A reliability analysis should be included and the range of demographic and response quality variables should be expanded.

Vary Response Wave Conditions

The current study was comprised of an initial solicitation to participate followed by four reminders, but used only two response waves. A future study should be conducted to compare variables among early and late responders by creating a response wave the initial solicitation plus each reminder (Pavalko & Lutterman, 1973).

Anecdotal Comments and Multiple Response Use

The current study observed a difference in response length by survey mode, but an analysis of response length in anecdotal comments by survey mode was not possible. Additionally, findings indicated that response length in anecdotal comments, pronoun use in anecdotal comments, and multiple response use was each statistically different than zero, suggesting that may be valuable variables to capture and analyze. Future studies should extend these findings to analyze anecdotal comments and multiple response use in both mail and web survey modes. In the web mode, text boxes may be strategically placed

throughout the questionnaire to capture anecdotal comments. In the mail mode, clearer directions and better item structuring may reduce multiple response use.

Response Quality

Although item completion errors were not significantly different by survey mode or response wave, the presence of invalid responses in a dataset may reduce overall data quality and influence results. Future research should explore ways to reduce item completion errors in all survey modes, although special attention should be paid to the role of automated features in reducing item completion errors in web surveys. Additionally, future studies comparing parallel mail and web modes should examine the influence of various automated features on item nonresponse. An analysis tracking use of the final "submit" button to distinguish completed versus abandoned web surveys would be very helpful in advancing the field's understanding of item nonresponse in web surveys. The current study examined differences in demographics and response quality by mode and wave; however, future studies should expand this analysis to examine the effects of demographics on response quality. Future studies could also analyze the quality of open-ended responses with respect to response sophistication, reading level analysis, and unique themes.

Cognitive Interviewing

Schonlau et al. (2002) argue, "little is known about the effects of web survey instrument design on how survey participants respond to a particular survey question or the survey as a whole, or what sort of design enhances response rates or information accuracy" (p. 79). An analysis comparing mail and web surveys using cognitive interviewing and related methods can address this gap as well as determine respondents' item comprehension, explore what respondents consider when selecting a response,

identify item ordering effects and response burden, and understand why respondents skip items (Sirken et al., 1999; Sudman et al., 1996; Tourangeau et al., 2000).

A Theory of Mail and Web Survey Design Issues

A review of the literature comparing and contrasting mail and web surveys provides a range of studies addressing quantitative features such as demographics, response rates, costs, response quality, social desirability bias, etc. While many of these studies produce somewhat consistent findings for certain variables by survey mode (e.g., age, ethnicity, pronoun use, yea-saying, and response length), some of them do not (e.g., gender, item nonresponse and item completion errors), making it difficult for survey researchers and practitioners to develop a set of expectations that can be depended upon when designing future studies. The inconsistency of some findings may be due to the influence of design issues between the two modes within studies (e.g., how the survey is received, different reading and writing formats, respondent burden, mode completion time, visual display), as well as the variety of automated features available for use between web surveys in different studies. Very few studies were found that examined design issues between mail and web modes (see Jones, Fraser, & Dowling, 2005) and no studies were found proposing a theory of how such design differences influence demographics and response quality. It has been suggested that potential differences in respondent burden associated with differences in questionnaire length and the time to complete (and download if a web survey) a questionnaire (Couper et al., 1997; Fisher & Kydoniefs, 2001), differences in perceived stress associated with answering sensitive items, functionality, and task demands may contribute to mail and web differences (Fisher & Kydoniefs, 2001; Jones et al., 2005). Differences in the visual display of questionnaires may also produce differences in mail and web modes (Dillman, 2000). While a mail

respondent sees a questionnaire in the exact format the researcher intended, web surveys may display differently or even incorrectly depending on variations in a respondent's hardware and software (Dillman, 2000). Tourangeau (2003) comments,

> We are only just beginning to have a sense of…the key variables that determine whether there is agreement or disagreement across modes of data collection. The issues raised by web surveys are particularly hot right now partly because web surveys are primarily visual and use a much wider range of visual material…than has been true of surveys in the past. (pp. 5-6)

Future studies addressing gaps in the field's understanding of circumstances that contribute to similarities and differences in mail and web survey modes would do much to advance the practice of survey research.

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APPENDIX A
HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

WESTERN MICHIGAN UNIVERSITY

Human Subjects Institutional Review Board

Date: April 28, 2006

To: Brooks Applegate, Principal Investigator
Dawn Mackety, Student Investigator for dissertation

From: Mary Lagerwey, Ph.D., Chair

Re: HSIRB Project Number: 06-04-24

This letter will serve as confirmation that your research project entitled "Mail and Web Surveys: A Comparison of Demographic Characteristics and Response Quality When Respondents Self-Select the Survey Administration Mode" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: April 28, 2007

Walwood Hall, Kalamazoo, MI 49008-5456
PHONE: (269) 387-8293 FAX: (269) 387-8276

APPENDIX B
PACKET FOR SCHOOL PRINCIPALS

WESTERN MICHIGAN UNIVERSITY

College of Education
Career Connections Research Center
Creating Pathways to IT Careers Project
Creating Career Connections for Students with Disabilities Project

September 26, 2005

Dear School Principal:

We are writing regarding survey materials we mailed you late last spring. As we indicated then, we are collaborating with the Illinois State Board of Education (ISBE) to study career development activities in Illinois schools. Funded by the National Science Foundation and U. S. Department of Education, this research includes surveys of school counselors and IT-related CTE teachers to learn about their involvement in assessment, planning, and recruitment activities with students in grades 6 – 12.

Your assistance is absolutely essential to this research! However, we have not yet heard from you or your staff. Enclosed is another set of survey materials. We need your help to distribute the materials to the relevant counselors and teachers in your school. With their input, we will gather new information about counselor and teacher involvement in specific career development activities.

Please be assured that everyone's participation is strictly **voluntary.** Also— be assured that the information you provide is **completely confidential,** as are the responses of your staff. We will **not** share the information with your colleagues, administration, district, state, or anyone else.

We ask that you help with two things:

- Review the enclosed *Principal's Survey Distribution Record.* On it, we list the names of the school counselors and CTE IT-related teachers identified for your school. **Please correct this list and/or add new names as needed.** Then return the corrected copy to us in the envelope provided by *October 14.*
- Distribute the enclosed survey packets **right away** to each individual on the corrected list so they can respond by October 21. *Please call or email us if you need additional packets.* Counselors and teachers can use the enclosed questionnaire or complete the survey on-line— whatever is easiest for them. It should take **less than 30 minutes** to complete the survey.

Please call us right away at **269-387-6181** if you have any concerns or questions. Again— for this research to be meaningful, **we need your assistance.** With your help and the participation of your counselors and teachers, we will gather new knowledge about career assessment, planning, and recruitment activities with students in grades 6 – 12. **Thank you for your time!**

Respectfully yours,

Paula D. Kohler

Paula D. Kohler, Ph.D.
Professor and Project Director, paula.kohler@wmich.edu

3506 Sangren Hall, Kalamazoo, MI 49008-5258

Illinois State Board of Education

100 North First Street · Springfield, Illinois 62777-0001
www.isbe.net

Rod Blagojevich
Governor

Jesse H. Ruiz
Chairman

Dr. Randy J. Dunn
State Superintendent of Education (Interim)

MEMORANDUM

TO: Illinois School Principals

FROM: Mark Williams, Division Administrator MW
Career Development and Preparation

DATE: April 21, 2005

RE: Support of Research

The Career Development and Preparation Division of the Illinois State Board of Education endorses the federal research of 1) ***Creating Career Connections for Students with Disabilities: A Longitudinal Study of their Enrollment and Outcomes of Career and Technical Education*** and 2) ***Creating IT Career Pathways through High School Career and Technical Education Programs***. The success of this study is a collaborative effort, and it is important for you to encourage your teachers to participate.

Thank you for your assistance with distributing the survey packets and returning the distribution record to Dr. Paula Kohler and Dr. Brooks Applegate at Western Michigan University. Your participation and encouragement will be highly valued and appreciated!

The contact person in the Career Development and Preparation Division is Carol Brooks and she can be reached by e-mail at cbrooks@isbe.net or by phone at 217/786-4620. Thanks for your support.

Printed by AFL-CIO (AFSCME Local #2811 and IFSOE Local #3236) Employees

Western Michigan University
Creating IT Career Pathways Project
and Creating Career Connections Project

Principal's Distribution List

Name		Position	Survey Distributed: Yes	Survey Distributed: No	If survey not distributed to the individual listed, please indicate action taken: Returned to WMU	If survey not distributed to the individual listed, please indicate action taken: Given to (Enter Name)

Please complete this form as soon as possible
and return to WMU in envelope provided. Thank you!

APPENDIX C
PACKET FOR SURVEY PARTICIPANTS

WESTERN MICHIGAN UNIVERSITY

College of Education
Career Connections Research Center
Creating Pathways to IT Careers Project
Creating Career Connections for Students with Disabilities Project

September 26, 2005

Dear School Counselor:

We are exploring career development activities in Illinois schools through two federally-funded projects sponsored by the National Science Foundation and U.S. Department of Education—Office of Special Education Programs. This research includes a survey of school counselors and CTE-IT teachers to learn about your involvement in assessment, planning, and recruitment activities with students in grades 6 – 12.

We selected you to participate in our survey because you have school counseling responsibilities with students within grades 6 – 12. **Your participation is very important to us!** With your input, we will gather new information about counselor and teacher involvement in specific career development activities.

You can participate in this study—**which should take less than 30 minutes**—in one of two ways. Choose the way that is **easiest** for you:

- Complete the enclosed survey and return it directly to us ***by October 21*** in the envelope provided (do not return to your principal), or
- Complete the survey on-line by ***October 21*** at: **http://www.surveyz.com/TakeSurvey?id=23228**

Your response is completely **confidential**. As soon as we receive it, we will check your name off our participant list, cut it from the paper survey or electronic file, and assign a code number. Only the researchers have access to code numbers. We will **not** reference you as an individual respondent and we will **not** share your responses with your colleagues, administration, district, state, or anyone else. (If you decide not to participate, please return the unanswered survey in the enclosed envelope and we will remove your name from our participant list.)

Please call us right away at **269-387-6181** if you have any questions or concerns. Again, your participation in this survey is important! We believe that your experiences as a school counselor are valuable and that your perspective will aid us in our exploration of career assessment, planning, and recruitment activities with students in grades 6 – 12. **Thank you in advance for your participation!**

Respectfully yours,

Paula D. Kohler, Ph.D.
Professor and Project Director
paula.kohler@wmich.edu

3302 B Sangren Hall, Kalamazoo, MI 49008-5258

WESTERN MICHIGAN UNIVERSITY

College of Education
Career Connections Research Center
Creating Pathways to IT Careers Project
Creating Career Connections for Students with Disabilities Project

WESTERN MICHIGAN UNIVERSITY
H. S. I. R. B.
Approved for use for one year from this date:

APR 0 5 2005

x Mary Lagerwey
HSIRB Chair

Dear School Counselor:

We are collaborating with the Illinois State Board of Education (ISBE) through two federally-funded projects to explore career development activities in Illinois schools. The *Creating Pathways to IT Careers Project* (funded by the National Science Foundation) is investigating factors that influence enrollment, concentration, and employment experiences of high school females in Career and Technical Education-Information Technology (CTE-IT) programs. The *Creating Career Connections Project* (funded by the U.S. Department of Education—Office of Special Education Programs) is investigating factors that influence enrollment, program concentration, and employment experiences of high school students with disabilities in Career and Technical Education (CTE) programs. Both of these projects include a survey of school counselors and CTE-IT teachers to learn about your involvement in assessment, planning, and recruitment activities with various groups of middle and high school students.

We have selected you to participate in our studies because you serve as a school counselor in Illinois. **Your participation is very important to us!** We know your time is valuable and that our request that you spend time on the survey may be an inconvenience. But, with your input, we will gather new information about counselor and teacher involvement in career assessment, planning, and recruitment activities. Your participation—which consists of completing a survey—is strictly **voluntary.** To participate in our survey, which should take about an hour to complete, please read the enclosed instructions. You can use the enclosed questionnaire to respond or complete the survey on-line—whatever is easiest for you. In either case, you may choose to *not* answer any question and simply leave it blank, or to not participate at all. If you choose to not participate, please return the unanswered survey in the enclosed stamped envelope and we will remove your name from our participant list.

All responses will be reviewed **only** by our research team and will be kept completely **confidential.** When we receive your response – either through the questionnaire or on-line – we will assign it a code number and your name will be removed from the response. Only the researchers will have access to coding information and no reference will be made to you as an individual respondent. We will *not* share your responses with your school, district, state, or anyone else. The on line survey responses will be collected through SurveyZ.com, a system that maintains the data behind a firewall, accessible only to the researchers. All aspects of the data are keyed to our account and cannot be accessed by anyone else.

3506 Sangren Hall, Kalamazoo, MI 49008-5258

If you have any questions about this survey or our studies, please feel free to contact either of us at the numbers listed below. You may also contact the Chair of the WMU Human Subjects Institutional Review Board at 269-387-8293 or WMU's Office of the Vice President for Research at 269-387-8298 if you have any questions or if any problems arise during the course of the study. For more information about our projects, visit our web site at www.wmich.edu/ccrc.

Again, your participation in this survey is important! We believe that your experiences as a school counselor are valuable and that your perspective will aid us in our exploration of career assessment, planning, and recruitment activities with students in secondary education. Your participation will help us generate new knowledge important to our field. **Thank you in advance for your time and input!**

Respectfully yours,

Paula D. Kohler, Ph.D.
Research Investigator
269-387-5955
paula.kohler@wmich.edu

Brooks Applegate, Ph.D.
Research Investigator
269-387-3886
brooks.applegate@wmich.edu

Please Note

This invitation to participate in our survey has been approved for use for one year by the WMU Human Subjects Institutional Review Board (HSIRB) as indicated by the stamped date and signature of the board chair in the upper right corner. Do not participate in this study if the stamped date is older than one year.

School Counselor Survey

Career Connections Research Center

Western Michigan University

INSTRUCTIONS

1. Two formats of this survey are available for your convenience:
   a. Record your responses on the enclosed questionnaire and return it **directly** to us in the envelope provided (do not return to your principal), **or**
   b. Complete the survey on-line. To respond on-line, connect to:

      http://www.surveyz.com/TakeSurvey?id=23228

      When you take the survey on-line, you may stop at any time, save your responses, and then complete the survey later. Specific directions for doing so are provided at the site. Your responses are not recorded until you click the submit button.
2. This survey is designed to gather information about how you are involved in career assessment, planning, and recruitment activities with the students for whom you are assigned responsibility (i.e., your "caseload" of students).
3. When responding, please answer the questions in the context of ***the 2004 - 2005 school year.***
4. Some items can be answered simply by checking one of several responses. Other items allow you to select more than one response. Still other items allow you the opportunity to provide your own brief description. On each item, we indicate your options for responding.
5. ***There are no right or wrong answers!*** Please respond to all items in a way that is accurate and appropriate for your particular situation.
6. If you have questions, please call or email:

   Shirley Swift: 269-387-6181, shirley.swift@wmich.edu
   Dr. Paula Kohler: 269-387-5955, paula.kohler@wmich.edu
   Dr. Brooks Applegate: 269-387-3886, brooks.applegate@wmich.edu
7. Please complete the questionnaire by ***October 21, 2005!***

Thank you for your participation ~ we value your input!

APPENDIX D
MAIL SURVEY

Career Connections Research Center

Western Michigan University

Phone: 269-387-6181
Fax: 269-387-2826

School Counselor Survey

Spring 2005

You may take the survey on-line at:

http://www.surveyz.com/TakeSurvey?id=23228

SECTION 1

School Counselor Work Setting and Caseload

1. Are you the individual whose name appears on the label in the right corner of the cover?

   ☐ Yes ☐ No – If no, please cross out the name listed and write your name

2. Do you work as a school counselor this year with students in any grade 6 through 12?

   ☐ Yes ☐ No – STOP and return the survey in the envelope provided.

3. Are you assigned to work with students in one specific school or more than one school?

   ☐ One school ☐ More than one school

4. Please provide the school name(s) and the percent of your work time allocated to each school:

School name	Percent of your work time			
	1 – 25%	26 – 50%	51 – 75%	76 – 100%
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐
_____	☐	☐	☐	☐

If you work in more than one school, please answer the remaining questions based on the school at which you spend the most time. If you spend equal time at multiple schools, pick one on which to base your responses and enter it below:

_____

The following questions refer to your "caseload" of students. By caseload, we mean the students for whom you are assigned specific responsibility.

5. Does your caseload consist of *all* the students in your school or a specific group or groups of students? (Check only one)

   ☐ All students in the school (Skip to question 8) ☐ Specific group(s) of students

6/7. If you indicated above that your caseload is comprised of specific groups of students, please check all group definitions that apply and describe the group.

- ☐ Specific grade(s) _____
- ☐ Alphabetic group _____
- ☐ Students in a specific curriculum _____
- ☐ Special population(s) _____

8. What percentage of your time do you spend (1) working directly with students and (2) on all the other tasks or activities where you are not working directly with students?

_____% time working directly with students ____% time not working directly with students

9. How many students are on your total caseload this school year?

ENTER NUMBER _____

10. Of the students on your total caseload this school year, how many receive special education services?

ENTER NUMBER of special ed students on caseload _____

11. In what grades are the students on your caseload? (Check all that apply)

12. Please check how often you will meet individually with the students on your caseload during this school year:

	0-2 times	3-4 times	Over 4 times	NA
Typical student with a disability	☐	☐	☐	☐
Typical student without a disability	☐	☐	☐	☐

13. During this school year, please list the <u>three</u> activities or tasks on which you spend the <u>most</u> time:

_____

_____

_____

SECTION 2
Career Assessment Activities

The questions in this section will help us understand more about how formal career assessments are implemented in your school and school counselor involvement in implementing these assessments. By formal career assessment, we mean assessments or assessment batteries or "packages" designed to provide information regarding students' career interests, aptitudes, abilities, or other constructs that help students make career choices and/or choose career paths.

14. Generally, do students on your caseload participate in any career assessment(s) at some time during their secondary education? (Check one)

☐ Yes ☐ No (Skip to Section 3 – page 7)

15. Which students on your caseload typically participate in career assessment(s) during their secondary education? (Check only one)

☐ All students (Skip to Question 17)

☐ Only specific groups of students (e.g., those in specific career tracks and/or population groups)

16. Please indicate which group(s) of students on your caseload participate in career assessment(s). (Check all that apply)

☐ College prep students
☐ Career and tech ed (CTE) or tech prep students
☐ Students who receive special education services
☐ Students who are economically disadvantaged
☐ Students who are academically disadvantaged
☐ Students with limited English proficiency
☐ Other(s):_____

Questions 17 through 28 focus on students with and without disabilities on your caseload. If your caseload does not include a specific group of students, please indicate NA.

Students with disabilities are students who receive special education services.

17. In general, what percentage of the students on your caseload participate in career assessment(s) during their secondary education?

	None	1-25%	26-50%	51-75%	76-100%	NA
Students with disabilities	☐	☐	☐	☐	☐	☐
Students without disabilities	☐	☐	☐	☐	☐	☐

18. How often does the typical student on your caseload participate in career assessment during his/her secondary education?

	Never	Once	Once, but not annually	Annually or more often	NA
Students with disabilities	☐	☐	☐	☐	☐
Students without disabilities	☐	☐	☐	☐	☐

19. Typically, at what grade do the students on your caseload first participate in career assessment?

	None	6	7	8	9	10	11	12	NA	Other (specify)
Students with disabilities	☐	☐	☐	☐	☐	☐	☐	☐	☐	_____
Students without disabilities	☐	☐	☐	☐	☐	☐	☐	☐	☐	_____

20. Where do the students on your caseload first participate in a career assessment?

	Nowhere	Area voc center	Your school	Another school	NA	Other (specify)
Students with disabilities	☐	☐	☐	☐	☐	_____
Students without disabilities	☐	☐	☐	☐	☐	_____

21. In your school, who has primary responsibility for implementing career assessment(s) for the students on your caseload?

	No one	I do	Other person	NA
Students with disabilities	☐	☐	☐	☐
Students without disabilities	☐	☐	☐	☐

22. If another person has primary responsibility for implementing career assessment(s) for the students with disabilities on your caseload, please indicate that person:

- ☐ Another school counselor(s)
- ☐ Academic teacher(s)
- ☐ Career and technical educational (CTE) teacher(s)
- ☐ Special education teacher(s)
- ☐ School psychologist(s)
- ☐ District administrator
- ☐ School administrator
- ☐ Other (please describe): _____

23. If another person has primary responsibility for implementing career assessment(s) for the students without disabilities on your caseload, please indicate that person:

- ☐ Another school counselor(s)
- ☐ Academic teacher(s)
- ☐ Career and technical educational (CTE) teacher(s)
- ☐ Special education teacher(s)
- ☐ School psychologist(s)
- ☐ District administrator
- ☐ School administrator
- ☐ Other (please describe): _____

24. What percentage of the students with disabilities on your caseload typically participate in each of the following types of assessments? If your caseload does not include students with disabilities, please check NA.

	None	1 – 25%	26 – 50%	51 – 75%	76 – 100%	NA
Basic aptitudes	☐	☐	☐	☐	☐	☐
Career interest	☐	☐	☐	☐	☐	☐
Personality profile	☐	☐	☐	☐	☐	☐
Work values	☐	☐	☐	☐	☐	☐
Work adjustment	☐	☐	☐	☐	☐	☐
Physical functioning	☐	☐	☐	☐	☐	☐
Other (please enter type) _____	☐	☐	☐	☐	☐	☐
Other (please enter type) _____	☐	☐	☐	☐	☐	☐

25. What percentage of the students without disabilities on your caseload typically participate in each of the following types of assessments? If your caseload does not include students without disabilities, please check NA.

	None	1 – 25%	26 – 50%	51 – 75%	76 – 100%	NA
Basic aptitudes	☐	☐	☐	☐	☐	☐
Career interest	☐	☐	☐	☐	☐	☐
Personality profile	☐	☐	☐	☐	☐	☐
Work values	☐	☐	☐	☐	☐	☐
Work adjustment	☐	☐	☐	☐	☐	☐
Physical functioning	☐	☐	☐	☐	☐	☐
Other (please enter type) _____	☐	☐	☐	☐	☐	☐
Other (please enter type) _____	☐	☐	☐	☐	☐	☐

26. Please indicate if you do the following activities with students on your caseload (check all that apply):

	Students with disabilities			Students without disabilities		
	Yes	No	NA	Yes	No	NA
Select career assessment(s)	☐	☐	☐	☐	☐	☐
Administer career assessment(s)	☐	☐	☐	☐	☐	☐
Interpret career assessments	☐	☐	☐	☐	☐	☐

27. For students with disabilities on your caseload, please list up to 5 career assessments and the percentage of students assessed with each:

Name of Assessment	% of students with disabilities				
	None	1 – 25%	26 – 50%	51 – 75%	Over 75%
1. _____	☐	☐	☐	☐	☐
2. _____	☐	☐	☐	☐	☐
3. _____	☐	☐	☐	☐	☐
4. _____	☐	☐	☐	☐	☐
5. _____	☐	☐	☐	☐	☐

28. For students <u>without</u> disabilities on your caseload, please list up to 5 career assessments and the percentage of students assessed with each:

Name of Assessment	% of students without disabilities				
	None	1 – 25%	26 – 50%	51 – 75%	Over 75%
1.	☐	☐	☐	☐	☐
2.	☐	☐	☐	☐	☐
3.	☐	☐	☐	☐	☐
4.	☐	☐	☐	☐	☐
5.	☐	☐	☐	☐	☐

SECTION 3
Career Planning Activities

The next questions will help us understand the time you spend and kinds of activities you are involved in regarding career planning with the students on your caseload. Questions 29 through 31 focus on students with and without disabilities. If your caseload does not include a specific group of students,

please indicate NA.

29. For each of the following, please indicate the proportion of students on your caseload with whom you typically implement or include in the activity.

	Students with disabilities						Students without disabilities					
	None	1 – 25%	26 – 50%	51 – 75%	76 – 100%	NA	None	1 – 25%	26 – 50%	51 – 75%	76 – 100%	NA
Administer career assessment(s)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information regarding results of career assessments	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Assist students to identify career goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information about career areas and/or options	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information about career requirements	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide assistance to develop or modify an educational program plan aligned with career goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information about secondary career and technical education programs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information about post-secondary career and technical education programs	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Provide information about post-secondary educational institutions (e.g., colleges and universities)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Teach career and/or employability skills	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

30. For each of the following career planning activities, please indicate the context in which you typically implement the activity with the students on your caseload.

Students with disabilities			Students without disabilities		
One-on-One	Group	NA	One-on-One	Group	NA
Administer career assessment(s)					
☐	☐	☐	☐	☐	☐
Provide information regarding results of career assessments					
☐	☐	☐	☐	☐	☐
Assist students to identify career goals					
☐	☐	☐	☐	☐	☐
Provide information about career areas and/or options					
☐	☐	☐	☐	☐	☐
Provide information about career requirements					
☐	☐	☐	☐	☐	☐
Provide assistance to develop or modify an educational program plan aligned with career goals					
☐	☐	☐	☐	☐	☐
Provide information about secondary career and technical education programs					
☐	☐	☐	☐	☐	☐
Provide information about post-secondary career and technical education programs					
☐	☐	☐	☐	☐	☐
Provide information about post-secondary educational institutions (e.g., colleges and universities)					
	☐	☐	☐	☐	☐
Teach career and/or employability skills					
☐	☐	☐	☐	☐	☐

31. Please indicate how <u>Important</u> it is that students on your caseload experience each of the following.

Students with disabilities			Students without disabilities		
Not Important	Somewhat Important	Very Important	Not Important	Somewhat Important	Very Important
Participate in career assessment(s)					
☐	☐	☐	☐	☐	☐
Receive information regarding results of career assessments					
☐	☐	☐	☐	☐	☐
Receive assistance in identifying career goals					
☐	☐	☐	☐	☐	☐
Receive information about career areas and/or options					
☐	☐	☐	☐	☐	☐
Receive information about career requirements					
☐	☐	☐	☐	☐	☐
Receive assistance to develop or modify an educational program plan aligned with career goals					
☐	☐	☐	☐	☐	☐
Receive information about secondary career and technical education programs					
☐	☐	☐	☐	☐	☐
Receive information about post-secondary career and technical education programs					
☐	☐	☐	☐	☐	☐
Receive information about post-secondary educational institutions (e.g., colleges and universities)					
☐	☐	☐	☐	☐	☐

SECTION 4
Recruitment and Support for Students in Nontraditional Occupations

The next questions will help us understand how you might be involved in recruiting and/or supporting students in academic or career and technical (CTE) education programs considered nontraditional (NT) for their gender.

Nontraditional (NT) programs are generally defined as those in which students of one gender represent 25% or less of those enrolled in the program (e.g., females in computer programming, males in nursing).

32. **In general, to what extent is NT enrollment in curricula or programs emphasized in your school? (Check one)**

☐ Not at all ☐ Somewhat ☐ Significantly

For questions 33-40, please indicate (1) whether you do the activity and (2) whether you consider the activity to be within the scope of your job.

33. Review career planning materials and practices for:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Gender bias and/or "representation"	☐	☐	☐	☐
Racial or ethnic bias and/or "representation"	☐	☐	☐	☐

34. Review curriculum and instructional materials for:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Gender bias and/or "representation"	☐	☐	☐	☐
Racial or ethnic bias and/or "representation"	☐	☐	☐	☐

35. Provide specific information about non-traditional careers and/or programs for:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Students	☐	☐	☐	☐
Parents/Guardians	☐	☐	☐	☐
Educators	☐	☐	☐	☐
Administrators	☐	☐	☐	☐

36. Conduct professional development	Do the activity		Within scope of job	
	Yes	No	Yes	No
Gender and/or ethnic bias	☐	☐	☐	☐
NT careers and/or programs	☐	☐	☐	☐
Sexual harassment prevention	☐	☐	☐	☐

37. Actively recruit:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Females to courses and/or programs in the STEM areas (science, technology, engineering, math)	☐	☐	☐	☐
Students for CTE programs non-traditional for their gender	☐	☐	☐	☐

38. Provide role models and/or mentors for:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Females enrolled in the STEM areas	☐	☐	☐	☐
Students enrolled in CTE programs non-traditional for their gender	☐	☐	☐	☐

39. Provide support groups, peer counseling, or other support strategies for:	Do the activity		Within scope of job	
	Yes	No	Yes	No
Females enrolled in the STEM areas	☐	☐	☐	☐
Students enrolled in CTE programs non-traditional for their gender	☐	☐	☐	☐

40. Identify:	Do the activity		Within scope of job	
	Yes	No	Yes	No
STEM area work opportunities in the community for female students.	☐	☐	☐	☐
Nontraditional work opportunities in the community for students	☐	☐	☐	☐

SECTION 5

Demographic Information

The following questions will tell us a little about your background. In studies like these, we like to compare the experiences and perspectives of people of varying backgrounds.

41. What is your gender? ☐ Female ☐ Male

42. What is your racial or ethnic background?

- ☐ Black or African American
- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ White or Caucasian
- ☐ Latino/Hispanic
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Biracial or multiracial

43. What is your age? _____ (Enter number of years)

44. Please indicate how well you think your formal education (undergraduate and graduate) and continuing education (inservice training) prepared you to do these things:

	FORMAL Education			CONTINUING Education		
	Very well	Moderately well	Not at all	Very well	Moderately well	Not at all
Meet the overall demands of your job	☐	☐	☐	☐	☐	☐
Conduct career assessments and planning with students with disabilities	☐	☐	☐	☐	☐	☐
Conduct career assessments and planning with students without disabilities	☐	☐	☐	☐	☐	☐
Conduct career assessments and planning with students with racial or ethnic backgrounds different from yours	☐	☐	☐	☐	☐	☐
Use specific strategies to recruit students to curricula and/or programs nontraditional for their gender	☐	☐	☐	☐	☐	☐
Use specific strategies to support students in curricula and/or programs nontraditional for their gender	☐	☐	☐	☐	☐	☐

45. Please list the 2 most rewarding aspects of your job:

1. _____

_____

2. _____

_____

46. Please list the 2 most significant challenges confronting school counselors:

1. _____

_____

2. _____

_____

47. If you would like the results of our survey, please enter your email address:

_____

48. Additional Comments:_____

_____

Your perspective is important to us!
Thank you for participating in our study!

Please return your survey in the enclosed envelope by:

MAY 20, 2005

Career Connections Research Center
1903 W. Michigan Avenue
Western Michigan University
3302B Sangren Hall
Kalamazoo, MI 49008-5258
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IDEAs that Work

Career Connections Research Center
Western Michigan University

http://www.wmich.edu/ccrc

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WESTERN MICHIGAN UNIVERSITY

APPENDIX E
WEB SURVEY

3% Complete

Career Connections Research Center
Western Michigan University
269.387.6181

Welcome to the School Counselor Survey!

SECTION I
School Counselor Work Setting and Caseload

1. Please give us your name.

2. Do you work as a school counselor this year with students in any grade 6 through 12?

- Yes
- No

Continue

Please contact shirley.swift@wmich.edu if you have any questions regarding this survey.

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4% Complete

3. Are you assigned to work with students in one specific school or more than one school?

- One school
- More than one school

Continue

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10% Complete

Percent of work time				School name (Text will scroll inside of window)
1 - 25%	26 - 50%	51 - 75%	76 - 100%	
○	○	○	○	
○	○	○	○	
○	○	○	○	

If you work in more than one school, please answer the remaining questions based on the school at which you spend the most time. If you spend equal time at multiple schools, pick one on which to base your responses and enter it below.

The following questions refer to your "caseload" of students. By caseload, we mean the students for whom you are assigned specific responsibility.

5. Does your caseload consist of all students in your school or a specific group or groups of students? (Check only one)

- ○ All students in the school
- ○ Specific group(s) of students

Continue

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11% Complete

6. You indicated that your caseload is comprised of specific groups of students. Please check all group definitions that apply.

- ☐ Specific grade(s)
- ☐ Alphabetic group
- ☐ Students in a specific curriculum
- ☐ Special populations
- ☐ Other

Continue

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12% Complete

7. Please describe your caseload parameters.

${piping_text}

Continue

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19% Complete

8. What percentage of your time do you spend (a) working directly with students and (b) on all the other tasks or activities where you are not working directly with students?

% of time working directly with students

% of time not working directly with students

9. How many students are on your total caseload this school year? (ENTER NUMBER)

10. Of the students on your total caseload this school year, how many receive special education services? Please enter the NUMBER of special education students below.

11. Please check how often you meet individually with students on your caseload per year.

Typical student with a disability				Typical student without a disability			
0 - 2 times	3 - 4 times	Over 4 times	NA	0 - 2 times	3 - 4 times	Over 4 times	NA
○	○	○	○	○	○	○	○

12. During this school year, please list the three activities or tasks on which you spend the most time.

Continue

Please contact shirley.neill@umich.edu if you have any questions regarding this survey.

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21% Complete

Section II - Career Assessment Activities

The questions in this section will help us understand more about how formal career assessments are implemented in your school and school counselor involvement in implementing these assessments.

By formal career assessments, we mean assessments or assessment batteries or "packages" designed to provide information regarding students' career interests, aptitudes, abilities, or other constructs that help students make career choices and/or choose career paths.

13. Generally, do the students on your caseload participate in any career assessment(s) at some time during their secondary education ?

- ○ Yes
- ○ No

Continue

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22% Complete

14. Which students on your caseload typically participate in career assessment(s) during their secondary education? (Check only one)

- ○ All students
- ○ Only specific groups of students (e.g., those in specific career tracks and/or population groups)

Continue

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100% Complete

15. You indicated that only specific groups of students on your caseload participate in career assessment(s). Please indicate which group. (Check all that apply)

- ☐ College prep students
- ☐ Career and tech ed (CTE) or tech prep students
- ☐ Students who receive special education services
- ☐ Students who are economically disadvantaged
- ☐ Students who are academically disadvantaged
- ☐ Students with limited English proficiency
- ☐ Other

Questions 16 through 24 focus on students with and without disabilities on your caseload. If your caseload does not include a specific group of students, please indicate NA.

Students with disabilities are students who receive special education services.

16. In general, what percentage of the students on your caseload participate in career assessment(s) some time during their secondary education?

	Students with disabilities					Students without disabilities					
	None	1 - 25%	26 - 50%	51 - 75%	76 - 100%	NA	None	1 - 25%	26 - 50%	51 - 75%	76 - 100%	NA
	○	○	○	○	○	○	○	○	○	○	○	○

17. How often does the typical student on your caseload participate in career assessment during his/her secondary education?

	Students with disabilities			Students without disabilities		
	Once	More than once, but not annually	Annually or more often	Once	More than once, but not annually	Annually or more often
	○	○	○	○	○	○

18. Typically, at what grade do the students on your caseload first participate in career assessment?

Students with disabilities								Students without disabilities							
6	7	8	9	10	11	12	Other	6	7	8	9	10	11	12	Other
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

If you answered "other" for students with or without disabilities, please indicate other grade below.

Please check group	Please specify other grade (Text will scroll inside of window)
Students with disabilities ○	
Students without disabilities ○	

19. Where do the students on your caseload first participate in a career assessment?

Students with disabilities					Students without disabilities				
Area voc center	Your school	Another school	NA	Other	Area voc center	Your school	Another school	NA	Other
○	○	○	○	○	○	○	○	○	○

If you answered "other" for students with or without disabilities, please indicate other place below.

Please check group	Other place that students first participate (Text will scroll inside of window)
Students with disabilities ○	
Students without disabilities ○	

20. In your school, who has primary responsibility for implementing career assessment(s) for the students on your caseload? (Check only one)

Students with disabilities		Students without disabilities	
I do	Other person	I do	Other person
○	○	○	○

If you answered "other person" for students with disabilities, please answer the following question.

21. Who has primary responsibility for implementing career assessement(s) for the students with disabilities on your caseload? (Check only one)

- ☐ Another school counselor(s)
- ☐ School psychologist(s)
- ☐ Academic teacher(s)
- ☐ Special education teacher(s)
- ☐ Career and technical educational (CTE) teacher(s)
- ☐ School administrator
- ☐ District administrator
- ☐ Other

If you answered "other person" for students without disabilities, please answer the following question.

22. Who has primary responsibility for implementing career assessement(s) for the students without disabilities on your caseload? (Check only one)

- ○ Another school counselor(s)
- ○ School psychologist(s)
- ○ Academic teacher(s)
- ○ Special education teacher(s)
- ○ Career and technical educational (CTE) teacher(s)
- ○ School administrator
- ○ District administrator
- ○ Other

23. What percentage of the students with disabilities on your caseload typically participate in each of the following types of assessments?

	None	1 - 25%	26 - 50%	51 - 75%	76 - 100%
Basic aptitudes	○	○	○	○	○
Career interest	○	○	○	○	○
Personality profile	○	○	○	○	○
Work values	○	○	○	○	○
Work adjustment	○	○	○	○	○
Physical functioning	○	○	○	○	○

	None	1-25%	26-50%	51-75%	76-100%	Enter other type of assessment (Text will scroll inside of window)
Other 1	○	○	○	○	○	
Other 2	○	○	○	○	○	

24. What percentage of the students without disabilities on your caseload typically participate in each of the following types of assessments?

	None	1 - 25%	26 - 50%	51 - 75%	76 - 100%
Basic aptitudes	○	○	○	○	○
Career interest	○	○	○	○	○
Personality profile	○	○	○	○	○
Work values	○	○	○	○	○
Work adjustment	○	○	○	○	○
Physical functioning	○	○	○	○	○

	None	1-25%	26-50%	51-75%	76-100%	Enter other type of assessment (Text will scroll inside of window)
Other 1	○	○	○	○	○	
Other 2	○	○	○	○	○	

25. As a school counselor, how are you involved with implementing career assessments with students on your caseload? (Check all that apply)

	Students with disabilities	Students without disabilities
Selecting career assessment(s)	○	○
Administering career assessment(s)	○	○
Interpreting career assessment(s)	○	○
I'm not involved	○	○

26. For students with disabilities on your caseload, please list up to 5 career assessments (right column) and the percentage of students assessed with each (left column).

	% of students with disabilities				Name of assessment (text will scroll inside of window)
	None	1-25%	26-50%	51-75%	Over 75%	
Assessment 1	○	○	○	○	○	
Assessment 2	○	○	○	○	○	
Assessment 3	○	○	○	○	○	
Assessment 4	○	○	○	○	○	
Assessment 5	○	○	○	○	○	

27. For students without disabilities on your caseload, please list up to 5 career assessments (right column) and the percentage of students assessed with each (left column).

	% of students **without** disabilities				**Name** of assessment (text will scroll inside of window)
None	1-25%	26-50%	51-75%	Over 75%	
Assessment 1					
○	○	○	○	○	☐
Assessment 2					
○	○	○	○	○	☐
Assessment 3					
○	○	○	○	○	☐
Assessment 4					
○	○	○	○	○	☐
Assessment 5					
○	○	○	○	○	☐

Section III - Career Planning Activities

The next questions will help us understand the time you spend and kinds of activities you are involved in regarding career planning with the students on your caseload.

Questions 28 through 29 focus on students with and without disabilities. If your caseload does not include a specific group of students, please indicate NA.

28. For each of the following, please indicate the proportion of students on your caseload with whom you typically implement or include in the activity.

	Students **with** disabilities						Students **without** disabilities					
	None	1-25%	26-50%	51-75%	76-100%	NA	None	1-25%	26-50%	51-75%	76-100%	NA
Administer career assessment(s)	○	○	○	○	○	○	○	○	○	○	○	○
Provide information regarding results of career assessment(s)	○	○	○	○	○	○	○	○	○	○	○	○
Assist students to identify career goals	○	○	○	○	○	○	○	○	○	○	○	○
Provide information about career areas and/or options	○	○	○	○	○	○	○	○	○	○	○	○
Provide information about career requirements	○	○	○	○	○	○	○	○	○	○	○	○
Provide assistance to develop or modify an educational program plan aligned with career goals	○	○	○	○	○	○	○	○	○	○	○	○
Provide information about secondary career and technical education programs	○	○	○	○	○	○	○	○	○	○	○	○
Provide information about post-secondary career and technical education programs	○	○	○	○	○	○	○	○	○	○	○	○
Provide information about post-secondary educational institutions (e.g., colleges and universities)	○	○	○	○	○	○	○	○	○	○	○	○
Teach career and/or employability skills	○	○	○	○	○	○	○	○	○	○	○	○

29. For each of the following career planning activities, please indicate the context in which you typically implement the activity with the students on your caseload.

	Students with disabilities			Students without disabilities		
	One-on-One	Group	NA	One-on-One	Group	NA
Administer career assessment(s)	○	○	○	○	○	○
Provide information regarding results of career assessment(s)	○	○	○	○	○	○
Assist students to identify career goals	○	○	○	○	○	○
Provide information about career areas and/or options	○	○	○	○	○	○
Provide information about career requirements	○	○	○	○	○	○
Provide assistance to develop or modify an educational program plan aligned with career goals	○	○	○	○	○	○
Provide information about secondary career and technical education programs	○	○	○	○	○	○
Provide information about post-secondary career and technical education programs	○	○	○	○	○	○
Provide information about post-secondary educational institutions (e.g., colleges and universities)	○	○	○	○	○	○
Teach career and/or employability skills	○	○	○	○	○	○

30. **Please indicate how important it is that students on your caseload experience each of the following.**

	Students **with** disabilities			Students **without** disabilities		
	Not Important	Somewhat Important	Very Important	Not Important	Somewhat Important	Very Important
Participate in career assessment(s)	○	○	○	○	○	○
Receive information regarding results of career assessment(s)	○	○	○	○	○	○
Receive assistance in identifying career goals	○	○	○	○	○	○
Receive information about career areas and/or options	○	○	○	○	○	○
Receive information about career requirements	○	○	○	○	○	○
Receive assistance to develop or modify an educational program plan aligned with career goals	○	○	○	○	○	○
Receive information about secondary career and technical education programs	○	○	○	○	○	○
Receive information about post-secondary career and technical education programs	○	○	○	○	○	○
Receive information about post-secondary educational institutions (e.g., colleges and universities)	○	○	○	○	○	○

Section IV

Recruitment and Support for Students in Nontraditional Occupations

The next questions will help us understand how you might be involved in recruiting and/or supporting students in academic or career and technical (CTE) education programs considered nontraditional (NT) for their gender.

Nontraditional (NT) programs are generally defined as those in which students of one gender represent 25% or less of those enrolled in the program (e.g., females in computer programming, males in nursing).

31. In general, to what extent is NT enrollment in curricula or programs emphasized in your school? (Check only one)

○ Not at all ○ Somewhat ○ Significantly

For questions 32 - 39, please indicate (a) whether you do the activity and (b) whether you consider the activity to be within the scope of your job.

32. Review guidance materials and practices for...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Gender bias and/or "representation"	○	○	○	○
Racial or ethnic bias and/or "representation"	○	○	○	○

33. Review curriculum and other school materials for...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Gender bias and/or "representation"	○	○	○	○
Racial or ethnic bias and/or "representation"	○	○	○	○

34. Provide specific information about nontraditional careers and/or programs to...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Students	○	○	○	○
Parents/guardians	○	○	○	○
Educators	○	○	○	○
Administrators	○	○	○	○

35. Conduct professional development regarding...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Gender and/or ethnic bias	○	○	○	○
NT careers and/or programs	○	○	○	○
Sexual harrassment prevention	○	○	○	○

36. Actively recruit...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Females to courses and/or programs in the STEM areas (science, technology, engineering, math)	○	○	○	○
Students for CTE programs non-traditional for their gender	○	○	○	○

37. Provide role models and/or mentors for...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Females enrolled in the STEM areas	○	○	○	○
Students enrolled in CTE programs nontraditional for their gender	○	○	○	○

38. Provide support groups, peer counseling, or other support strategies for...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
Females enrolled in the STEM areas	○	○	○	○
Students enrolled in CTE programs nontraditional for their gender	○	○	○	○

39. Identify...

	Do the activity		Activity is within the scope of your job	
	Yes	No	Yes	No
STEM area work opportunities in the community for female students	○	○	○	○
Nontraditional work opportunities in the community for students	○	○	○	○

Section V

Demographic Information

The following questions will tell us a little about your background. In studies like these, we like to compare the experiences and perspectives of people of varying backgrounds.

40. What is your gender?

○ Female ○ Male

41. What is your racial or ethnic background?

○ Black or African American
○ American Indian or Alaskan Native
○ Asian
○ White or Caucasian
○ Latino/Hispanic
○ Native Hawaiian or other Pacific Islander
○ Biracial or multiracial

42. **What is your age? (Enter number of years)**

43. **Please indicate how well you think your formal education (undergraduate & graduate) and continuing education (inservice training) prepared you to do these things.**

	FORMAL education			CONTINUING education		
	Very Well	Moderately Well	Not at All	Very Well	Moderately Well	Not at All
Meet the overall demands of your job	○	○	○	○	○	○
Conduct career assessments and planning with students **with** disabilities	○	○	○	○	○	○
Conduct career assessments and planning with students **without** disabilities	○	○	○	○	○	○
Conduct career assessments and planning with students with racial or ethnic backgrounds different from yours	○	○	○	○	○	○
Use specific strategies to **recruit** students to curricula and/or programs nontraditional for their gender	○	○	○	○	○	○
Use specific strategies to **support** students enrolled in curricula and/or programs nontraditional for their gender	○	○	○	○	○	○

44. Please list the 2 most rewarding aspects of your job:

First most rewarding aspect:

Second most rewarding aspect:

45. Please list the 2 most significant challenges confronting school counselors:

First challenge:

Second challenge:

46. If you would like the results of our survey, please enter your email address.

Your perspective is important to us! Thank you for participating in our study!

Continue

Please contact shirley.swift@wmich.edu if you have any questions regarding this survey.

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Thank You

Thank Your For Participating in Our Survey!

Your responses have been saved and recorded with ID **636741**

Thank You for Completing this Survey

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