The Role of Focus Group Venue: A Comparative Study of Face-to-Face, Telephone, and Internet Video-Based Venues

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THE ROLE OF FOCUS GROUP VENUE: A COMPARATIVE STUDY
OF FACE-TO-FACE, TELEPHONE, AND
INTERNET VIDEO-BASED VENUES

by

June E. Gothberg

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Educational Leadership, Research and Technology
Advisor: E. Brooks Applegate, Ph.D.

Western Michigan University
Kalamazoo, Michigan
June 2012
THE GRADUATE COLLEGE
WESTERN MICHIGAN UNIVERSITY
KALAMAZOO, MICHIGAN

Date May 14, 2012

WE HEREBY APPROVE THE DISSERTATION SUBMITTED BY

June E Gothberg

ENTITLED The Role of Focus Group Venue: A Comparative Study of Face-to-Face, Telephone, and Internet Video-Based Venues

AS PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF Doctor of Philosophy

Educational Leadership, Research and Technology (Department) 

Evaluation, Measurement and Research (Program)

APPROVED

Dean of The Graduate College

Dissertation Review Committee Chair
Dissertation Review Committee Member
Dissertation Review Committee Member

APPROVED

Dean of The Graduate College

Date June 2012
The purpose of this study was to examine the equivalence or non-inferiority for comparisons of telephone focus group venue to face-to-face focus group venue, Internet video-based focus group venue to face-to-face focus group venue, and Internet video-based focus group venue to telephone focus group venue. Research questions examined the equivalence and non-inferiority of five variables reported in the literature as fundamental reasons a researcher would choose focus groups as a data collection tool. The five variables were: participant interactions, breadth of conversation, depth of conversation, disclosure of sensitive information, and adherence to the topic. Variables were measured using content and linguistic analysis. Outcomes from these analyses were tested using two one-sided $t$ tests (TOST) to test for equivalence. If TOST indicated equivalence or non-inferiority between venues, a stricter one-tailed $t$ test was conducted to confirm the findings.

Research was conducted on focus groups ($n = 18$) from extant evaluation data measuring the self-determination outcomes of students with disabilities. This allowed for the analysis of disclosure of sensitive information with questions targeted at living with a disability. Students participated ($n = 64$) from three different states. The original
evaluation employed a $3 \times 3$ Latin square design to control for gender, state, and focus group venue.

Results revealed face-to-face focus group venues are unequaled in the area of participant interactions. The telephone venue provided a second choice for research projects whose goal is to extract depth of conversation or keep participants on-topic. However, if the main goal is to access sensitive information, the telephone venue appeared the most suitable. The Internet video-based focus group venue may provide a viable option to explore breadth or depth of information. Nonetheless, the Internet video-based venue only proved equivalent to the telephone focus group venue for participant interactions.

Findings suggest a researcher needs to carefully consider the potential effects of focus group venue. Further, the researcher needs to allow the research question and design to guide how a focus group venue is chosen. This study provides practical insight regarding the use of telephone and Internet video-based focus group venues and offers much potential for future research.
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2012
ACKNOWLEDGMENTS

Though only my name is on the cover of this dissertation, it could not have come to fruition without the sacrifice, support, and efforts of many people. I would never have been able to finish this work without the support of my husband, to whom this work is dedicated. Johnny, you are my best friend. You inspire me to be more and go further than I ever could on my own.

First and foremost, thank you to my committee chair, Dr. Brooks Applegate. I have been fortunate to have such a dedicated educator and mentor. You spent the last six years encouraging me academically and professionally, believing in my abilities and giving me a chance to work in the field. My life is forever changed.

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Finally, this section is dedicated to my family. Without your support this would have just stayed a dream. You all have sacrificed many weeks and months of your own lives while I dissertated. To my children: Caleb, who stops in to give me random hugs, notes, and encouragement and makes sure I see my granddaughter; Casey, who makes me feel I am a special someone, discloses this publically, and takes me out to eat; Ethan, my son from another mother who shows up at just the right time and loves to debate whatever I am working on; Taylor, my rock, you love me no matter how tired or grumpy I get, I can always count on you, I hope I do make you proud; and to my precious Jalynn, you will always be my lucky penny, you are a breath of fresh air and the sunshine in my life, always encouraging and extending grace. To Paula, who is more family than friend, I can never thank you enough for all the days of support and encouragement you have brought to me. To my parents, John and Pat Watters, I wouldn’t be who I am today without your endless belief in me and years of sacrifice to get me to where I am today. My sister Ellen,
her husband Bruce, my niece Sarah, and her husband Chuck, you all made me feel like I could really accomplish this. To my mother June Watters, I miss you more than words can say; thank you for being the wind beneath my wings. To my dad, Michael Jones, thank you for the faithful letters and phone calls of encouragement. To my Gothberg parents and family, John and Sally; Kevin, Stephanie, Brayden, Aubrey, and Brody; Marc, Michelle, Garrett, and Gabe, thank you for all the years of prayer, belief, and support. Thank you to my Grandpop Thorpe Mealing and family friend Jim Andreson; I wish you could have lived to see me finish. To my amazing Great Grandmother Isabel Mealing, who at 101 still emailed me weekly to make sure I was working on my dissertation, I miss you. At last, thank you to God for putting my feet on this path and giving me the strength to finish. I can’t wait to see what’s next. Psalm 30:5.

June E. Gothberg
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CHAPTER I

INTRODUCTION

Chapter I introduces the current study and is arranged into four sections. The first section gives background information regarding the use of focus groups. Section two introduces the statement of the problem, characterizing the breadth of the problem scope, and highlights current trends in focus group design. The third section identifies the significance of the research and its potential to impact the field. Section four provides the research questions and briefly introduces equivalence and non-inferiority measures. The final section concludes with an overview of the dissertation contents.

Focus Groups as an Emergent Social Science Research Methodology

The use of focus groups in educational research and evaluation has gained acceptance and popularity as a tool to understand educational stakeholder needs, measure student learning outcomes, probe community perceptions, and inform practice, policy, and fiduciary decisions (Scott & Morrison, 2006; Singh, 2008).1 Although the education field did not embrace focus groups as a research tool for educational decision making until recently, the idea was proposed in the literature as early as the late 1980s. Advocates insisted that focus groups are “a technique for talking in a purposeful way with a select group of interviewees in order to gain insight into educational effectiveness” (Lederman, 1990, p. 127). With current widespread application, focus groups are used to assist
administrators and other school leaders make informed decisions about the phenomenon under investigation in order to make school improvements (Latess, 2008).

Focus groups usually bring to mind a small group sitting around a table in a conference room, roughly the same age and status, enjoying snacks, answering a moderator’s questions on topics of interest (Haley, Sheehan, Morrison, & Taylor, 2011). However, in the past century, technology has changed the stereotypical focus group and allowed for greater flexibility in research design and implementation (Morgan, Fellows, & Guevara, 2008). Researchers are now enjoying an unprecedented smorgasbord of options for implementing focus groups, which continue to expand and grow.

The location of the focus group, henceforth referred to as venue, has expanded beyond conventional spatial and temporal boundaries (Iacobucci, 2001). While venue options were historically restricted to mutually shared space and time, now options permit participation from remote, isolated, or undisclosed locations and in some research designs even allow for asynchronous involvement. Researchers have taken advantage of these options as shown by the increase in publications that include focus group venues using the telephone and Internet as primary data gathering options (Mann & Stewart, 2000; Morgan et al., 2008; Nicholas et al., 2010; Oringderff, 2004; Poynter, 2010). With continued frequency, researchers have reported using more than one focus group venue in the same study with no discussion of implications to doing so, thus suggesting no regard to how the venue affects data quality and integrity (Frazier et al., 2010). The introduction of these additional venues into the research design have implications with regard to the stimuli used in the data gathering process, to the possibilities for aggregating and
analyzing data, and the way in which the relationships between participants and researcher and researched is structured (Graffigna & Bosio, 2006).

The growth of implementation options for conducting focus groups and the widespread acceptance of flexible focus group approaches appear to correlate with their overall use. Recent literature searches revealed an increase in studies that included focus groups as part of the design with over a thousand studies reported in the year 2006 (Morgan et al., 2008). To more fully understand this trend, the researcher conducted a count of the past 20 years of focus group publications appearing in the PsychInfo, Web of Science, and ProQuest Dissertation and Thesis databases using an inclusive phrase search with wildcard to allow for variations for the term *focus group*. As seen in Figure 1, a sharp increase was shown for the last 20 years of publications that include the term *focus group*.

A comparison between the first and second decades showed student research, as measured by thesis and dissertation publications had a steady upward trend with a 125% increase. This was due in part to the increase in the number of published student research from 3,445 student publications in the first decade (between the years 1992-2001) to 7,764 publications in the second decade (between the years 2002-2011). Database searches revealed even higher trends for professional publications. Web of Science demonstrated a 375% increase with 2,957 publications between the years 1993-2001 (no data were available for 1992) and 13, 804 publications between the years 2002-2011. Similarly, PsychInfo exhibited an incredible 442% increase with 2,544 publications between the years 1992-2001 and 14,074 publications between the years 2002-2011.
Three additional searches were conducted to determine the extent of (1) the use of telephone focus group venue, (2) the use of Internet focus group venue, and (3) the use of multiple venues within the same study. The search included several terms to indicate the use of a telephone venue (e.g., phone, cell, conference call) and terms associated with the use of an Internet-based venue (e.g., virtual, ustream, blog); however, when discrepancies surface that created confusion over which venue—for example, would Skype be considered part of the telephone or Internet venue?—the decision was made that if a computer was used to conduct the focus group, then the venue was associated with Internet, not telephone (see Appendix E for a full listing of search terms). Limitations to the analysis included (1) that the ever-changing landscape of technology made it
impossible to create an exhaustive list of search terms therefore may have decreased the number of matches returned, and (2) conversely, the researcher randomly sampled the search results and found a small number of returns which did not meet the criteria, thus produced slightly inflated positive results. Nevertheless, even having accounted for these limitations, the results showed a steady evolution of diverse focus group venue use that in turn provided evidence for the need to study how focus group venues may impact the research study.

The usage trend for telephone, Internet, and multiple venues mirrored that of focus groups in general. As seen in Figure 2, the number of publications that reported the use of telephone focus group venue raised from only 2 publications in 1992 to 108 publications in 2011. Comparing the past two decades, a 484% increase was shown with 109 publications reporting telephone focus group use during the first decade (between the years 1992-2001) to 637 publications in the second decade (between the years 2002-2011). Not surprising, the publications that reported Internet-based focus group venue presented a much steeper incline with only one publication in 1992 to 298 in 2011. In fact, when comparing the past two decades, publications reporting Internet-based focus groups demonstrated a 1560% increase as shown by 75 publications the first decade (between the years 1992-2001) to 1,245 publications in the second decade (between the years 2002-2011).

Finally, the use of multiple focus group venues within the same study was examined. While fewer publications were shown, the trend of using multiple focus group venues within the same study mirrored that of the overall focus group trends (see Figure
2). In 1992 there were no publications that reported multiple focus group venues; however, by 2011 the number of publications grew to 35.

**Figure 2.** Focus group publications by telephone, Internet, and multiple venues

Another large percent increase was seen when the past two decades were compared with a 1,243% increase between decades. The number of publications that reported multiple venue use was 14 publications the first decade (between the years 1992-2001) to 188 publications in the second decade (between the years 2002-2011). As can be seen, the use of telephone-based focus group venues, Internet-based focus group venues, and researchers implementing multiple venues within the same study, continue to increase creating a need to study the venue effects of these as compared to the traditional face-to-face focus group venue.
Statement of the Problem

As stated, researchers often present focus group findings in the literature as if they are as equally reliable and valid. The number and variety of venues chosen for the research design may well have repercussions to the study’s findings due to the likeliness of exchanged or interchanged venues to confound the data. For example text-based interactions with participants in the same locations may not be compatible or comparable to video-based interactions with participants at different locations. At the extreme of this dilemma, no evidence presented itself in the literature to defend the placement of asynchronous venues in the focus group family of data collection tools. According to definitions found in the literature of what constitutes a focus group, asynchronous venues may not fully meet the criteria:

1. The uniqueness is its [the focus group’s] ability to generate data based on the synergy of group interaction (Green, Draper, & Dowler, 2003; Stewart, Shamdasani, & Rook, 2007).
2. [A focus group] generates data by capitalizing on the interactions that only occur within groups (Sim & Snell, 1996).
3. “[Focus groups] provide an interactive environment. Focus groups enable people to ponder, reflect, listen to experiences and options of other. This interaction helps participants compare their own personal realities to those of others” (Krueger & Casey, 2009, p. 12).
4. “Although focus groups are indeed a form of interviewing, the source of data is the interaction among the participants” (Morgan, 2012, p. 162).
Thus it is questionable whether a data collection tool in which participants contribute from separate locations and at separate times actually has the ability to preserve the interactive environment associated as a fundamental characteristic of focus groups. Thus the question is whether what is currently presented in the literature as “asynchronous focus groups” actually meet the criteria of a true focus group venue.

The number of focus group venue options seem to be only limited to a researchers knowledge and creativity. One of the most popular venues explored in recent years are avatar-based focus group venues conducted in online worlds. Researchers reported that the fundamentals of focus groups have not changed except that the data collection is through virtual worlds rather than in person, indeed it may improve data collection by including the ability to use tools and software created specifically to analyze text, audio, and video on-demand (Smith, Kisiel, & Morrison, 2009). Along with virtually conducted focus groups, other venues have become popular. Table 1 shows a sample of the range of venues reported in recent years.

Despite increased numbers of focus groups conducted each year and the number of choices a researcher has for focus group venues, very few side-by-side comparisons exist. Although there is great interest in these venues, scant research has been conducted on their common and specific ability to elicit content from the participants equal to that obtained through traditional face-to-face venues (Underhill & Olmstead, 2003). In fact, when researchers address focus group venue choice their decisions often focus on cost and accessibility in lieu of the appropriateness of the venue to the research question. However, a few researchers have acknowledged that technology use has led to changes in the nature of research in terms of challenging the underpinning assumptions and opening
Table 1

A Sample of Focus Group Venues Reported in the Literature

<table>
<thead>
<tr>
<th>Venue</th>
<th>Type</th>
<th>Participant Location</th>
<th>Authors and Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>telephone</td>
<td>voice</td>
<td>different</td>
<td>Krueger &amp; Casey, 2000</td>
</tr>
<tr>
<td>Internet synchronous</td>
<td>text</td>
<td>same</td>
<td>Franklin &amp; Lowry, 2001</td>
</tr>
<tr>
<td></td>
<td>text</td>
<td>different</td>
<td>O’Conner &amp; Madge, 2003</td>
</tr>
<tr>
<td></td>
<td>voice</td>
<td>different</td>
<td>James &amp; Bushel, 2009</td>
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<td></td>
<td>Kozinets, 2009</td>
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<td></td>
<td>video</td>
<td>different</td>
<td>Sedgwick &amp; Spiers, 2009</td>
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<tr>
<td></td>
<td>avatar</td>
<td>different</td>
<td>Cowdery et al., 2011</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Jarmon &amp; Sanchez, 2009</td>
</tr>
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<td>Internet asynchronous</td>
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<td>different</td>
<td>Deggs et al., 2010</td>
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<td>Im &amp; Chee, 2006</td>
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<td>James &amp; Bushel, 2009</td>
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<td>Tates et al., 2009</td>
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<td></td>
<td>Turney &amp; Pocknee, 2005</td>
</tr>
<tr>
<td>face vs. telephone</td>
<td>both</td>
<td>both</td>
<td>Graffigna &amp; Bosio, 2006</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Frazier et al., 2010</td>
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<tr>
<td>face vs. Internet</td>
<td>both</td>
<td>both</td>
<td>Nicholas et al., 2010</td>
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<td></td>
<td></td>
<td>Schneider et al., 2002</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Underhill &amp; Olmstead, 2003</td>
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to possible areas to research (O’Conner & Madge, 2003; Poynter, 2010). There are early anecdotal reports stating online focus groups did not produce the same results as face-to-face with researchers encountering limitations in regard to moderator roles, group dynamics, participant anonymity, lack of stimuli, and technical difficulties (Hughes &
Lang, 2003). However, recent years have brought growth and vast improvement to online data collection that may have mitigated these issues.

**Purpose of the Research**

The purpose of this research was to fill an important gap by providing empirical side-by-side comparisons of focus group venues. As detailed, there was concern that certain venues used interchangeably with the face-to-face focus group venue may not meet focus group criteria. Due to this, the researcher decided to compare three venues of close parameters. All venues chosen for this study were voice-based synchronous venues: the face-to-face focus group venue, the telephone focus group venue, and the synchronous online voice-based venue with video feed.

**Significance of the Research**

Sound practice requires that the research question and research design should ultimately guide how a focus group is constructed (Onwuegbuzie, Dickinson, Leech, & Zoran, 2010; Tremblay, Hevner, & Berndt, 2010). This dissertation focused on filling gaps in understanding on how focus group venue may impede or enhance a research design. At one level every research project selecting focus groups as a data collection tool makes the same basic design decisions; the selection, location, and recruiting of participants, the interview questions, who and how to moderate the discussion, and plans for data analysis (Morgan & Bottorff, 2010). Yet there is little empirical guidance available to direct a researcher to make sound choices in focus group venues. The
outcomes of this comparison study will aid researchers to align focus group venues to the research design and questions.

**Research Questions**

This study was interested in measuring whether the application of technology-based focus group venues are equivalent to or at least no worse than the traditional face-to-face venue. Clinical medicine refers to this as a non-inferiority trial and as it is statistically impossible to prove equivalence, the closest equivalence measures to date (Laster & Johnson, 2003; Mascha & Sessler, 2011). The five research questions examined the non-inferiority and equivalence characteristics fundamental to focus groups between treatment and control venue and between the two treatment venues.

1. Are **participant interactions** in the telephone focus group venue equivalent or non-inferior to face-to-face focus group venue? Are **participant interactions** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Are **participant interactions** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

2. Is **breadth of conversation** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **breadth of conversation** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **breadth of conversation** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?
3. Is **depth of conversation** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **depth of conversation** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **depth of conversation** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

4. Is **disclosure of sensitive information** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **disclosure of sensitive information** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **disclosure of sensitive information** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

5. Is **adherence to the topic** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **adherence to the topic** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **adherence to the topic** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

**Research Paradigm**

Researchers have their own worldview or paradigm that influences the design and implementation of studies. The fundamental methodological problem that all researchers
face is “what kinds of connections are possible between ideas, social experience, and social reality” (Blaikie, 2007, p. 13). Quality research requires making these assumptions, paradigms, and frameworks explicit in the writing of a study (Corbin & Strauss, 2008; Creswell, 2007; Creswell & Plano-Clark, 2007; Denzin & Lincoln, 2005; Glesne, 2011; Hatch, 2002; Merriam, 2009; Morgan, 2007; Neuman, 2006). This interconnection of worldview, strategies of inquiry, and research design is illustrated by Creswell (2009):

Researchers need to think through the philosophical worldview assumptions that they bring to the study, the strategy of inquiry that is related to this worldview, and the specific methods or procedures of research that translate the approach into practice.… Although philosophical ideas remain largely hidden in research (Slife & Williams, 1995), they still influence the practice of research and need to be identified. (p. 5)

The paradigm guides researcher inquiries by a basic set of philosophical beliefs or assumptions (Lincoln & Guba, 2005; Mertens, 2009). They represent common elements with differing views on the five philosophical assumptions of research: ontology, epistemology, axiology, rhetorical, and methodological assumptions (Creswell, 2007). Thus, the researcher paradigm is decided by the researcher’s view on the nature of reality (ontology) and stance of how knowledge is gained of what is known (epistemology) (Creswell & Plano-Clark, 2007).

Epistemology is a branch of philosophy concerned with the theory of knowledge (Willig, 2008). It is characterized as the philosophical study of the nature, sources, and limits of knowledge (Moser, Mulder, & Trout, 1998). Of major importance is to determine what counts as knowledge or what it is we claim to know and criteria for deciding when knowledge is both adequate and legitimate (Blaikie, 2010; King & Horrocks, 2010). Establishing “epistemological integrity” between the genre, overall
strategy, research questions, design, and methods is essential (Marshall & Rossman, 2006). However, this is not an easy task, especially in qualitative research inquiry that is not characterized as a homogeneous field and embraces a diverse range of theoretical traditions (Madill, Jordan, & Shirley, 2000). Given such pluralism, researchers may be informed by a broad assortment of assumptions of epistemology and these divergent “lenses” often result in “contested claims about ‘good practice’ in qualitative methodology” (Freeman, 2006, p. 492).

Krauss (2005) states, “epistemology is intimately related to ontology and methodology; as ontology involves the philosophy of reality, epistemology addresses how we come to know that reality” (pp. 758-759). Ontology is considered a starting point of all research, after which one’s epistemological and methodological positions logically follows (Grix, 2004). Further, ontology relates to the nature of reality and its characteristics (Creswell, 2007). Blaikie (2010) asserts:

Ontological assumptions are concerned with the nature of social reality. These assumptions make claims about what kinds of social phenomena do or can exist, the conditions of their existence and the ways in which they are related…. Each of the research strategies entails a particular combination of ontological and epistemological assumptions. (p. 92)

This often taken-for-granted concept frequently is not viewed as something to be brought to light and discussed making ontology especially problematic by eclectically borrowing from a variety of schools with different ontologies (Hojjer, 2008). Collectively, a paradigm is made up from ontological and epistemological assumptions (Mack, 2010).

Cooper (2003) believes there always will be “art” in the conduct of science because “scientists bring their personal insights to decisions about what and how to study” (p. 3). At the extremes of philosophical underpinnings reside those born from a
positivist or realist paradigm and those from a constructivist paradigm. A variety of choices and practices fall along a continuum, where some researchers are closer to positivism and others distance radically from it (Ospina, 2004). While few align themselves as purists to either extremity, people disagree on the fundamental beliefs of the extent to which our understanding of the world can approach objective knowledge, or even some kind of truth about the world (Willig, 2006). The classical distinctions continue to divide the field into artificial extremes as expressed by Freeman (2006):

> While a number of realist [positivist] approaches may be differentiated, all share an assumption that the scientific method is capable of capturing true representations of the world…. In contrast, researchers informed by a constructionist epistemology reject the assumption of a single reality, available to all, revealed by the correct application of method. In contrast, knowledge is characterized as provisional and context dependent, and consequently the re-formation of criteria such as objectivity and reliability is rejected. (p. 492)

Given the nature of the five research questions (participant interactions, breadth of conversation, depth of conversation, disclosure of sensitive information, adherence to the topic), the philosophical assumptions of this study were a post-positivist epistemology with a realist ontological stance subscribed to the view that “real” elements of existence are discoverable using appropriate methods of data collection and analysis (King & Horrocks, 2010). Close to positivism, the post-positivist epistemology accepts the limits of positivism and rather than expecting certainty, acknowledges the limits to absolute truth and objectivity (Crotty, 1998; Maxwell, 2005). The analysis process used a systematic inductive approach to develop and identify the themes, triangulated with a computerized linguistic analysis, and culminated in a deductive, quantitative analysis.
Limitations

For the purposes of this dissertation the major limitation to this study should be considered.

1. This dissertation used extant data derived from an evaluation used to measure the effectiveness of a specific educational practice. As such, the researcher had no control over the original design.

Delimitations

For the purposes of this dissertation several delimitations should be considered.

1. The dissertation research design was restricted to previously determined parameters. While the evaluation design increased strength by employing a replicated Latin square design to control for variance in state, gender, and focus group venue, the study was restricted to 17 degrees of freedom. The dissertation data were also stripped of identifying demographic variables, making it impossible to conduct follow up studies. Thus, it was not possible to follow up with participants or moderators to gather data on how venue affected their willingness and ability to answer questions.

2. The study was also restricted as to the sampling strategy. The original design included a three-phase hierarchical sampling model from which the evaluation team selected three of four intensive states to study. From there a contact from the state team was asked to select a representative sample of schools from a pool of those who received professional development in the target area. At
that point a school contact was asked to select students to participate in the focus groups who met the criteria indicated. Thus, the evaluation team lost control of the sampling during the first phase and the dissertation researcher had no control over the sampling methods whatsoever. Of a pool of over 1,000 students, 64 participated in the focus groups. Further, the researcher had little ability to determine the representativeness of the sample.

3. The original study used a common focus group instrument in all three venues, the instrument itself was not field-tested, thus no reliability was established prior to implementation.

**Definitions**

For the purposes of this study the following words are defined.

**Asynchronous.** In an asynchronous study, participants can log in and answer topics on their own time, through listservs, mailing lists, or discussion groups (Oringderff, 2004).

**Avatar.** An avatar is any digital representation (graphical or textual), beyond a simple label or name, that has agency (an ability to perform actions) and is controlled by a human agent in real time (Bell, 2008).

**Clinical trial.** A clinical trial is defined as a prospective study comparing the effect and value of intervention(s) against a control in human beings (Friedman, Furberg, & DeMets, 1998).
**Content analysis.** This is a generic name for a variety of textual analysis that involves comparing, contrasting, and categorizing a corpus of data to test a hypothesis (Schwandt, 2001).

**Epistemology.** Epistemology is a branch of philosophy concerned with the theory of knowledge (Willig, 2008).

**Equivalence.** Equivalence is defined as the treatment effect being between $-\Delta$ and $\Delta$ (Piaggio, Elbourne, Altman, Pocock, & Evans, 2006).

**Focus group.** A type of interview involving an interviewer and a group of research participants, who are free to talk with and influence each other in the process of sharing their ideas and perceptions about a defined topic (Gall, Gall, & Borg, 2003).

**Latin square design.** The Latin square design is an extension of a within-subjects design that makes it possible to control two nuisance variables (Leroy, 2011).

**Linguistic analysis.** Linguistic analysis identifies semantic entities, relationships, and structure within the given text and hypothesis (Chambers et al., 2007).

**Non-inferiority.** Non-inferiority trials are intended to show whether a new treatment has at least as much efficacy as the standard or is worse by an amount less than $\Delta$ (Piaggio et al., 2006).

**Superiority.** If the lower limit of the CI is greater than 0, then superiority is shown (Ng, 2003).

**Synchronous.** Synchronous studies are similar to traditional face-to-face as they feature real time interaction between the moderator and participants, but use chatrooms or software packages (Oringderff, 2004).
**Venue.** A venue is a place where events of a specific type are held (Merriam-Webster, 2007).

**Organization of This Dissertation**

This study is organized into five chapters. Chapter I is the introduction to the study which provides the background of the study, a discussion of the preliminary study, the purpose of the study, the research problem, research questions, and a brief overview of methodology. Chapter II is the review of important literature about focus group methodology, what is known about focus group venue, Latin square design, discourse analysis as it pertains to focus groups, and qualitative methods for creating themes and codes. Chapter III describes the methodology for the study in detail, which includes the research design, sample characteristics, instrumentation, data collection methods, quality of the data, and data analysis procedures. Results of the study are presented in Chapter IV, and the conclusions and implications are summarized in Chapter V.
CHAPTER II

REVIEW OF LITERATURE

Chapter II provides the foundational context and critical analysis of focus groups that led to the current study. In order to understand the implications of venue on focus groups, one must first know the intended theoretical value for conducting focus groups as well as historical and modern practices. Section one explores the history of focus groups followed by Section two, the current implementation of focus groups. The third section provides the key characteristics of focus groups that lead to the selection of dependent variables. Section four addresses the review and selection of data analysis methods. This is followed by Section five, a review of the range of venues used under the heading “focus group” as well as identified unique attributes each venue contributes. The final section identifies the importance of studying focus group venue.

This dissertation study captured three critical overlapping elements of scientific inquiry. As such, it has the potential to open researcher dialog to even those located at the peripheries of quantitative and qualitative positions. The researcher provided complete transparency of the steps taken to gauge the integrity of an oft used tool typically attributed to qualitative methods. However, in order to conduct this study with rigor, the researcher implemented techniques from quantitative data analysis. Thus to fully understand the actions taken by the researcher, a reader must consider the three overlapping elements. First, and the primary interest to this dissertation study, is the study
of the effects of venue on using focus groups as a data collection tool. However, that testing could not have taken place outside other considerations. The second element of consideration was the characteristics of scientific inquiry and design in which this research was placed. A reflection of the ideology and epistemology which led to the paradigm for the setting of this research was explored in Chapter I. Finally, the third element investigated was hypothesis testing and the consequences due to a multiple comparison study. This study undertook all these and was situated where these three elements overlapped (Figure 3).

![Figure 3. Venn diagram showing the three elements of research](image)

**History of Focus Groups**

The use of focus groups is not new; however, both its use as a data collection tool and the methodological theory surrounding it have varied over time (Lunt & Livingstone, 1996). Focus groups have been in evidence since the 1920s, when social psychologist
Emory Bogadus used group interviews to research social distance, followed a few years later by sociologist Karl Mannheim, who conducted group interviews to study the social construction of generation (Kvale & Brinkmann, 2009; Liamputtong, 2008; Stewart et al., 2007; Tainsh, 2007; Wilkinson, 2004). In the late 1930s, social scientists began investigating alternative ways to conduct group interviews, and as early as 1934, Robert Merton and his colleagues started conducting focused interviews (Ashbury, 1995; Engel & Schutt, 2009; Krueger & Casey, 2009). In the literature, researchers described these interviews conducted in group settings as early as the 1940s (Goldman & McDonald, 1987). Nonetheless, it is difficult to identify and credit one founder of focus groups (Grant & Fitzgerald, 2005). However, Merton tends to be identified as the father of the focus group due to his seminal work with Paul Lazarsfeld to assess audience responses to wartime propaganda radio programs (Bloor, Frankland, Thomas, & Robson, 2001; Bosco & Herman, 2010; Hollander, 2004; Kratz, 2010; Krueger & Casey, 2009; Puchta & Potter, 2004; Stewart et al., 2007; Vaughn, Schumm, & Sinagub, 1996). Merton and Kendall (1946) christened group interview responses as “focused interviews,” the ancestor to the term *focus group* (p. 541).

**Origins of Focus Groups**

Focus groups originated from two distinct theoretical practices: (a) clinical psychological uses of group analysis and therapy, and (2) sociological and social psychological studies of group dynamics (Stewart et al., 2007). Specifically, Goldman and McDonald (1987) state the group depth interview traces its roots to the variegated methods of behavioral science and psychotherapy emphasizing that the core concerns of
these disciplines are obviously quite diverse, each adding a unique layer to the modern-day focus group data collection principles. Moreover, researchers in numerous disciplines continue to rely on focus groups as a primary source of data. A comprehensive literature review confirmed 20 disciplinary fields citing the Merton, Fiske, and Kendall’s (1956) foundational work, *The Focused Interview* (Lee, 2010).

To further complicate the origins, there was also much interdisciplinary collaboration in the early days. The theoretical underpinnings of focus groups emerged from what is described as a rich stew of socio-psychological and psychotherapeutic traditions and techniques (Goldman & McDonald, 1987). These heterogeneous orientations contribute to disagreements regarding how focus groups are used, designed, and fielded (Farnsworth & Boon, 2010). Over time, they produced hybrid forms whose design reflects varying degrees of sociological and psychological influence (Stewart et al., 2007).

Although focus groups had early origins in the social sciences, marketing and advertising researchers readily embraced them, and focus groups became increasingly identified with these fields (Levers, 2005). The focus group pioneers were hardly single-minded, and marked differences of opinion and approach reflect distinctive intellectual priorities within each parent discipline (Rook, 2003; Stewart et al., 2007). Thus, to understand the value of conducting focus groups and the implications of how focus group venue may impact the data collected, it is important to appreciate focus group merits from the three historical influencers: sociology, clinical psychology, and market research.

**Sociology.** The study of groups has a long history and many give credit to sociology as the founder of focus groups (Janesick, 2004; Merton et al., 1956; Webster &
Sociology’s core interest in groups and group behavior led researchers to employ group interviews in their research (Stewart, 2010). The most influential impetus to the growth of focus groups sprang at the frustration of radio researchers’ inability to diagnose why different programs received different likeability scores (Stewart et al., 2007). In 1941, this frustration led Paul Lazarsfeld of the Office of Radio Research at Columbia University to invite Robert Merton to evaluate audience response to radio programs (Bloor et al., 2001; Kamberelis & Dimitriadis, 2005; Krueger & Casey, 2009; Stewart, 2010; Stewart et al., 2007). Lazarsfeld was quantitatively collecting participant reaction to programs and following up with group open-ended questions. Merton felt compelled to suggest improvement by focusing on specifically indicated reactions and eliciting spontaneous expressions rather than researcher guided responses (Djuric, 2005; Merton, 1987). The purpose of radio research was to provide a basis for interpreting statically significant effects of mass communications. However, Merton and Kendall (1946) explained adding a qualitative layer may benefit experimental studies:

In general, experimental studies of effects might well profit by the use of focused interviews in research. The character of such application can be briefly illustrated by examining the role of the focused interview at four distinct points: (1) specifying the effective stimulus, (2) interpreting discrepancies between anticipated and actual effects, (3) interpreting discrepancies between prevailing effects and effects among subgroups—“deviant cases,” (4) interpreting processes involved in experimentally induced effects. (p. 542)

Merton’s ideas led to honing a set of procedures he labeled “focused interviews,” which he implemented fully in the analysis of Army training and morale films for the Research Branch of the U.S. Army Information and Education Division (Merton, Lowenthal, & Kendall, 1990; Lee, 2010). From this work, a set of four criteria were identified to lead productive focused interviews: (1) the criterion of nondirection, where guidance from the
interviewer is minimal; (2) the criterion of specificity, meaning the subject’s definition of the situation is full and specific; (3) the criterion of range, in which the interview maximized the range of evocative stimuli and responses reported by the subject; and (4) the criterion of depth and personal context, in which the interview brings out the affective and value-laden implications of the subjects’ responses (Merton & Kendall, 1946). Many of the aforementioned foundational elements of focused interviews in sociology continue today.

**Clinical psychology.** The use of focus groups in psychotherapeutic research emerged from quite different priorities than those of clinical diagnosis and treatment (Stewart, 2010). Some of the earliest clinical uses of groups date back to Moreno’s 1934 influential work with psychodrama and play therapy (Stewart et al., 2007). Researchers use psychodrama and role-plays to enact specific interactions and events allowing people to express their thoughts and feelings in spontaneous dramatic ways (Anderson, Braud, & Clements, 2011; Deacon, 2006). Many critics argue this early work is not a dependable data collection method. Edgar (1998) cautions there may be serious criticism of personal and social data collected by orthodox research methods such as focus groups due to a potential lack of truthfulness, issues of procedural reactivity, and biases that can enter the process. Disagreeing, Fern (2001) asserts that focus groups can perform various clinical and experiential tasks to assist a researcher investigate group members beliefs, feelings, and experiences, thus potentially parallel “psychotherapy groups-uncovering suppressed or unknown causes of behavior” (p. 216).

Groups conducted in this tradition tend to share exploratory, interactive, playful, and confrontational qualities of clinical psychological groups (Rook, 2010; Stewart et al.,
By contrast, focus groups rooted in social psychological thinking tend to be more evaluative in purpose, direct questioning, and lower in respondent interaction (Stewart, 2010). Therefore, the clinical approach is more likely to emphasize interactive group discussions and activities, whereas social psychological groups are more directed and controlled (Stewart et al., 2007). In addition, researchers influenced by the psychotherapeutic school tend to favor focus groups that are developmental or exploratory in orientation and design (Brownell, 2010; Elliot, Rivera, & Tucker, 2004; McLeod, 2001; Stewart et al., 2007). An enduring heritage of these clinical origins lies in today’s cadre of focus group moderators with professional backgrounds in traditional psychotherapy (Stewart, 2010).

**Market research.** Following World War II, market researchers discovered the practicality, usefulness, fast turnaround, and economic benefits of focus groups to ascertain consumer attitudes, opinions, and preferences related to designing products and services (Greenbaum, 1998; Krueger, 2009; Stewart et al., 2007; Vaughn et al., 1996). Researchers further developed focus groups for use in marketing and polling so that small groups of unrelated individuals could be brought together to discuss a new product or political candidate (Fontana & Frey, 2000; Jarvis, 2011; Krueger, 1994; Padgett, 2008). The initial emergence in marketing literature is strongly linked to the motivation researchers of the 1950s who typically had grounding in Freudian and non-Freudian thought (Catterall & Maclaran, 2006; Lee, 2010; Samuel, 2010; Stewart et al., 2007). Due to the social science movement towards experimental quantitative methods, by the late 1970s the only discipline reporting the use of the focus group method with any frequency was marketing research (Fern, 2001; Lunt & Livingstone, 1996).
Focus groups are now one of the most popular data collection methods for market research, as evidenced in their widespread use. For example, in qualitative marketing studies, the use of focus groups has grown steadily since the 1970s, and today, business expenditures in focus groups are estimated to account for at least 80% of the $1.1 billion spent annually on qualitative research (Wellner, 2003). While ubiquitous implementation occurred, researchers modified focus group procedures to meet their own distinct needs and to merge it with other types of group interviews that did not include the more statistically-based media focus procedure employed by Merton (Stewart et al., 2007). This resulted in a negative response from Merton (1987):

From what I have read and heard, I gather that much of focus-group research today as a growing type of market research does not involve this composite of both qualitative and quantitative inquiry. One gains the impression that focus-group research is being mercilessly misused as quick-and-easy claims for the validity of the research are not subjected to further, quantitative test. Perhaps the pressures of the marketplace for quick-and-easy-possibly, for quick and relatively inexpensive-research make for this misuse of focus groups.

As can be derived from the argument, today’s focus group takes different forms and does not necessarily follow all the procedures Merton identified in his book on focused interviews (Piercy & Hertlein, 2005; Stewart, 2010). In many ways, market research use of focus groups reflect both the social and clinical psychological traditions; however, the intellectual distinctions between the two schools are largely below the surface and tend to emerge in disconcertingly vague notions about what scientific research is and what falls short (Stewart et al., 2007).
Current Implementation of Focus Groups

The popularity and status of focus groups among behavioral researchers has ebbed and flowed over the years with distinctive patterns in particular fields seen today (Stewart et al., 2007). Whittenbaum and Moreland (2008) expound on the long history of small group research in social psychology, but note that toward the end of the 1950s social psychologists lost interest for awhile. In fact, it was during this period that focus groups fell out of favor in most academic social science arenas as the fields adopted more experimental and quantitative approaches (Stewart et al., 2007). However, focus groups reappear in mainstream social science research by the 1980s (Webb & Kevern, 2001). The 1980s saw an overall revival of sociological interest in qualitative research methods, which contributed to the reemergence of focus groups in applied research (Kress & Shoffner, 2007). Since that time, the number of researchers that report using and the number of disciplines that report accepting focus groups as a legitimate tool has increased, as seen by a three-fold increase in the number of focus group studies published in academic journals to date (Fern, 2001; Kitzinger & Barbour, 1999). Indeed, in the past decade focus groups experienced an unprecedented resurgence of interest in the social and behavioral sciences (Onwuegbuzie et al., 2010). The various patterns of focus group ascendance, decline, and revival make it seem reasonable to conclude that focus group research has never enjoyed such widespread usage across such an array of behavioral science disciplines and subfields as it does today (Stewart et al., 2007). As focus groups gain in popularity, new applications and models continue to appear. Further, as
technology expands beyond traditional boundaries, researcher options for employing focus groups continue to widen.

**Focus Groups as a Research Tool of Choice**

A reported benefit to collecting data by means of focus groups is the ability to gain deeper and richer insights into phenomena (Brown, 1999; Edgar, Freimuth, & Hammond, 2003; Massey, 2010). As a research tool, focus groups are grounded in the dynamics of group communication, group process, language, and thought (Marková, 2004). Focus groups enable researchers to study and understand a particular topic from the perspective of a group of participants rather than from one individual at a time (Wibeck, Dahlgren, & Öberg, 2007). Further, focus groups allow the researcher to probe participants in a way that may not be possible using other tools, for example, observation, one-to-one interviewing, or questionnaire surveys (Gibbs, 1997). The key reported benefit to using a focus group over other data collection tools is the direct interaction with the participants that allow the moderator the ability to clarify ambiguous information, qualify meaning, and probe for greater understanding (Finch & Lewis, 2003).

The dynamics of group discussions may provide benefits to the research at hand. When researchers send out a survey or conduct an interview, a participant will be limited to the ideas prompted by the survey question or interviewer during that session. The interactive nature of a focus group setting is said to encourage and prompt participant reactions, which can lead to discoveries and understanding that researchers may not have been able to discern in advance (Gill, Stewart, Treasure, & Chadwick, 2008; Kontio, Bragge, & Lehtola, 2008; McGarrell, London, & Benitez, 2003). While it is possible that
participant perspectives are independent of a group or its social setting, studies have shown that answers to some research questions are more apt to be revealed in a group setting than individually (Gibbs, 1997). In addition, researchers report participants are more comfortable in a group discussion than an individual interview and therefore responses are often more complete and less inhibited (Connaway & Powell, 2010; Parasuraman, Grewal, & Krishnan, 2007; Wimmer & Dominick, 2011).

The interactive nature of a focus group is recognized to build a combined effect referred to as synergy (Stewart et al., 2007). The discussions and debates that often occur in focus groups allow the researcher to observe multiple and partial viewpoints from collective and individual experiences of the phenomenon under investigation (Moyle, 2011). Moreover, group discussions lend themselves to a “snowballing effect,” in which participants build on previous statements causing the ideas of individual members to be passed around the group, gathering momentum and detail (Blackburn & Stokes, 2000; Piercy, Franz, Donaldson, & Richard, 2011; Stokes & Bergin, 2006). Thus, when compared to interviews that aim to obtain individual perspectives, focus groups elicit multiple points of view and may expand understanding through the group context (Gibbs, 1997).

Focus groups are not the right tool for all research questions; they are not a panacea for all research needs (Stewart & Shamdasani, 1990). Further, in a project of feminist focus groups it was found that focus groups were not effective in every situation and with every group (Jowett & O’Toole, 2006). In fact, a researcher can become quickly overwhelmed as focus groups can be time consuming; costly; and difficult to arrange, facilitate, and transcribe (Rodriguez, Schwartz, Lahman, & Geist, 2011). Additionally,
the researcher may need another data collection tool in instances when a study requires statistical data, when harm may come to people who openly share in a group, when participants are polarized or hold opposing views on controversial issues, and when focus groups are not an efficient or effective way to gather data for the topic of interest (Krueger & Casey, 2010). Thus, a researcher must carefully consider the research goals to determine if conducting focus groups are the best data collection tool to use.

**Characteristics of Focus Groups**

Originally, researchers cultivated focus groups as a process for gathering individual information quickly and efficiently in a group context (Hollander, 2004). Merton (1987) further distinguished characteristics of a focus group as shown in this paraphrase of Goldman and McDonald (1987):

> The distinguishing characteristic of the focused interview is that interviewees had been exposed [in a group] to concrete situations, the “objective” character of which is known to, and has been previously analyzed by, the interviewer. The interviewees have seen a film; heard a radio program; read a pamphlet, magazine, or advertisement; participated in a psychological experiment. In other words, the interview focuses on one experience of the respondent-exposure to a given stimulus situation, a situation which the interviewer has subjected to a “content analysis” which in turn has formed the basis of an “interview guide.” (p. 3)

In the decades following this seminal explanation, researchers shaped the characteristics of the focus group into the data collection tool it is today. Five of these were identified by the researcher as the most important focus group characteristics agreed upon in the literature: (1) participant interactions, (2) breadth of conversation, (3) depth of conversation, (4) disclosure of sensitive information, and (5) adherence to the topic. They distinguish focus groups from other research tools and would cause a researcher to choose
focus groups over other options. As such, this study explored these as the five dependent variables in this dissertation.

**Participant Interactions**

Interaction is the most reported characteristic of focus group studies that differentiate them from other data collection tools and some researchers regard interaction as the most important feature of a successful focus group (Gill et. al. 2008; Grønkjaer, Curtis, de Crespigny, & Delmar, 2011; Hemsley, Balandin, & Togher, 2008; Ho, 2006; Morgan, 1997). Further explained, the hallmark of focus groups is their explicit use of group interaction to produce data and insights that would be less accessible without the interaction found by focusing with a group of participants (Morgan, 1997). Description of this back and forth process is provided by Finch and Lewis (2003):

> Participants ask questions of each other, seek clarification, comment on what they have heard and prompt others to reveal more. As the discussion progresses (backwards and forwards, round and round the group), individual response becomes sharpened and refined, and moves to a deeper and more considered level. (p. 171)

Indeed, “science researchers uniformly agree that group interaction is the key distinguishing feature of focus groups” (Morgan & Lobe, 2011, p. 201).

**Breadth of Information**

Breadth is the coverage of information across key areas of interest (Ritchie & Lewis, 2003). Breadth is a concept from the field of social penetration which relates to the quantity of information as measured by category or frequency (Altman & Taylor, 1973). Category refers to the number of different topics shared and frequency refers to
how much information is given per topic (Derlega, Winstead, & Greene, 2008). Because one is often compromised for the other, a researcher must prioritize a priori between breadth and depth of conversation (Finch & Lewis, 2003). For instance, a researcher that prioritized breadth may choose in favor of having the moderator ask more questions quickly to look for a broad range of information rather than staying on one topic for a long period of time to probe for more detail. In education, the term *breadth* is most often described as being “a mile wide and an inch deep” (Schmidt, Wang, & McKnight, 2005). In business this idea is termed “the 30,000 foot view” and perceived as a vital perspective to program manager productivity (Allen, 2002). Both these definitions can assist a researcher decide between breadth and depth of conversation. If a researcher is interested in revealing the range of perspectives or diversity of opinions on an issue, breadth of conversation will be a variable to prioritize.

**Depth of Conversation**

Depth is the range of information shared, from surface level to core values and beliefs (Altman & Taylor, 1973). Depth refers to the intimacy level of the conversation (Derlega et al., 2008). Social penetration theory suggests an idea of peeling an onion. The outer layers provide the breadth of ideas and tend to be surface level conversations, while the deeper aspects of sharing expose the inner layer of the onion; accordingly, the deeper the penetration the more depth of conversation (Altman & Taylor, 1973). In other words, depth refers to the degree of intimacy that guides the topic discussion (West & Turner, 2007). For instance, a researcher may be interested in honing in on a particular aspect of the topic being studied and therefore limit the number of questions a moderator would ask
but give the moderator a list of probes to elicit greater depth of information about the phenomenon (Morgan, Krueger, & King, 1998). The moderator may direct these probes by simply asking, “Can you tell me more about that? Can you explain that to me?” or the researcher may direct the moderator to ask probes specific to the phenomenon under study (Frantz, 2012). Depth of conversation may be a variable of interest if a researcher is interested in collecting information on participant values, beliefs, principles, or other information that may not surface in typical conversation.

**Disclosure of Sensitive Information**

A fourth characteristic of focus groups is the ability to facilitate the collection of data about sensitive topics (Wutich, Lant, White, Larson, & Gartin, 2010). Undeniably, there is a sizeable body of literature that recommends the use of focus groups to gain access and insight into sensitive topics. Many studies show that participants may be more comfortable sharing their experiences in a homogenous group of people with similar concerns than in one-to-one interviews (Webb & Kevern, 2001). In fact, many researchers believe in and refer to this as “safety in numbers,” where many participants report they actually feel more comfortable disclosing in a group setting (Greenbaum, 2000). Thus, the idea presented in the early works of Merton, that participants revealed more sensitive information when they felt they were in a safe, comfortable place with people like themselves, is still relevant today (Merton et al., 1956). For example, in a focus group study aimed at gathering information to determine the level of racism found in Muslim men in Scotland, men showed a higher rate of disclosure of this sensitive information when groups consisted of a lower number of participants of the same belief as opposed to
individual interviews (Hopkins, 2007). In a review of the literature, focus groups were reported as “exceptionally effective” for the study of sensitive issues on such topics as acute mental distress, HIV/AIDS and other sexual health issues, attitudes toward smoking, sexual abuse, needs of gays and lesbians, and professional responses to changing management (Wong, 2008). For a researcher interested in a topic of sensitive nature, focus groups may prove the most suited data collection tool.

**Adherence to the Topic**

Morgan (1997) proposes there are many topics in which the effort required by natural observation would be excessive; in such cases, focus groups may be preferred to provide a means to steer the conversation. Focus groups may be used to explore broad topics of interest to narrowly focused topics, such as identifying the healthcare needs of children living with HIV/AIDS (Wong, 2008). One of the major benefits to focus groups is the presence of a moderator to focus participants on the topic of research. Furthermore, a focus group is a social situation and calls for a skilled moderator to guide the discussion (Krueger & Casey, 2009). In general, the researcher decides the topic of interest and provides a discussion guide for the moderator to follow (Massey, 2010; Wong, 2008). It is then the responsibility of the moderator to keep the discussion to the area of interest; thereby ensuring participant adherence to the topic (Greenbaum, 2000). The role a moderator plays may range from a more open-ended research agenda where the moderator does little more than bring the group back to the focus of the study from time to time to where the moderator works constantly to keep the participants focused, bringing them back to the main topic when needed (Johnson & Turner, 2003). The data
that emanate from participant responses to moderator questions and prompts provide the researcher insights based on the participants’ own words, their descriptions, interpretations, and commentary on the topics of interest (Massey, 2010). As such, the moderator provides the structure, intuition, and presence to allow and maintain topical adherence (Kahle, 2007; Onwuegbuzie et al., 2010).

**Major Focus Group Venues Found in the Literature**

With the expansion of technology, researchers have increased the use of technology-based tools to collect data and new niches for research have developed. In fact, the past decade has seen the emergence of new research specialties such as social network and virtual analysts. Aligned with this trend, researchers now have a plethora of venues in which to conduct focus groups beyond the traditional face-to-face venue. A growing body of literature includes reports of focus groups conducted in online and offline environments, executed in synchronous and asynchronous formats. In addition, researchers report executing a range of focus group venues exchangeability across studies and interchangeably within studies with no discussion as to the implications to the integrity of the data. Thus, it is imperative that once a researcher has decided focus groups are the appropriate data collection tool for the study, the next step is to determine the most suitable focus group venue. The following is a brief overview regarding venues most oft described in the literature along with the reported advantages and disadvantages of each.
Face-to-Face Focus Group Venue

Face-to-face interviews are often considered the “gold standard” of qualitative research (Hine, 2005; Lofland & Lofland, 1995; McCoyd & Kerson, 2006). When applied to focus groups, this traditional setting is conducted with all participants and moderators together in one location. Often, this approach allows for groups to be video recorded or observed through a one-way mirror (Schneider et al., 2002). Researchers report the advantages of the face-to-face focus group venue includes having a moderator in the room, receiving verbal and nonverbal cues from the moderator and other participants, the availability of visual stimulus to increase participant understanding and response, the play of group dynamics, and the ability to structure ideas from others’ comments (Chase & Alvarez, 2000; Klein, Tellefsen, & Herskovitz, 2007; Schneider et al., 2002). It has been argued that face-to-face focus groups cannot be replaced or replicated in online venues, emphasizing that it is impossible to guarantee security in the Internet environment: “it is virtually impossible to really know who is answering the questions, and whether there is another person sitting with the respondent monitoring what is being communicated in the session” (Greenbaum, 2008, p. 2). Many disadvantages of face-to-face focus groups are cited in the literature. They include cost, transportation, meeting strangers in an unfamiliar location, participation of individuals with visible differences, controlling power dynamics and dominators, problematic side conversations, psychological safety to participant, participants’ inhibition and discomfort in disclosing personal information on sensitive topics (Fox, Morris, & Rumsey, 2007; Hollander, 2004).
Telephone Focus Group Venue

Telephone focus group venues usually occur in a conference call setting with all participants calling into one line for synchronous talk and can be conducted with limited resources (Krueger & Casey, 2002; Tolhurst & Dean, 2004). Others state advantages of the telephone venue as the ability to reach geographically dispersed populations, a fact that permits for greater potential for participation, a decrease in cost and travel expense, an increase in the comfort level of participants who may choose their environment for the call, the ability of the moderator to take unobserved notes without causing discomfort to the participants, a decrease in social pressure, and an increase in anonymity (Carr & Worth, 2001; McCoyd & Kerson, 2006; Novick, 2008; Krueger & Casey, 2002; Tolhurst & Dean, 2004). Many studies report an increase in the amount of disclosure in telephone focus groups as compared to face-to-face focus group venues (Lau, Tsui, & Wang, 2003; Tourangeau, 2004). Participants claim they are more relaxed and perceive the telephone environment as a safe place to disclose sensitive information (Novick, 2008). Many researchers suggested this may be due to participants being in the comfort of their own living environment (Bloor et al., 2001; Fox et al., 2007; Kenny, 2005; O’Conner & Madge, 2003; Rezabek, 2000; Stewart & Williams, 2005; Tates et al., 2009).

Some critical studies signal less favorable outcomes. Researchers reported the major drawback of the telephone focus group venue as the telephone itself. It was difficult to solicit participants with limited telephone access in some region due to the percentage of the population who no longer has landlines (Monette, Sullivan, & DeJong, 2010). Other disadvantages reported in the literature were potential participants using call
blocking and call screening, limited conversations due to the absence of nonverbal and visual cues, and the dealing with participant environmental distractions (Holbrook, Green, & Krosnick, 2003; Pridemore, Damphousse, & Moore, 2005). Researchers warn that in most situations, two-hour telephone calls would not be tolerated by participants (Krueger & Casey, 2002). Thus, telephone focus groups tend to be shorter, have fewer participants, and fewer questions than its face-to-face counterpart, which, for some studies, may mean a loss in data.

**Internet-Based Focus Group Venues**

The Internet has been popularized as a research medium for the collection of primary data (Stewart & Williams, 2005). Cyber interviewing offers a means of altering the conventional spatial and temporal boundaries of focus group settings (Iacobucci, 2001). Initially, the Internet was seen as simply another modality to collect data, with little regard to the effects on the outcomes (Poynter, 2010). The implications for which are understudied. Under further examination, Stewart and Williams (2005) noted that while the expansion to the Internet was readily embraced by market researchers, it has now gained momentum to include all social sciences:

> Internet-based data collection is now part of the mainstream canon of methodological choices. Illustrative of this acceptance is the frequency with which contemporary methods texts in the social sciences now include sections covering the principles of online research. (p. 395)

Today, there are few researchers in the social sciences who could not find some aspect of their research interest manifested on the Internet (Hine, 2005). Moreover, the use of online education research has become well established in the past decade (Busher &
James, 2012). As such, researchers began adapting Internet technologies for conducting focus groups online over a decade ago to include both asynchronous and synchronous data collection (Morgan & Lobe, 2011). A discussion of each follows.

**Asynchronous text-based venue.** As stated earlier, it is questionable if the asynchronous format reported truly meets the definition of a focus group; nonetheless, many researchers are describing this as a focus group venue and it bears further discussion (McCoyd & Kerson, 2006). In a study of online self-help groups, the researcher concluded that computers may provide enough intimacy, despite asynchronous communication, and that researcher and participant both may be able to visualize themselves in the “room” together (Denzin, 1999). Thus, the idea of the environment which serves as the “place” research exists being replicated within an entirely new setting is worth scrutiny. Seminal online research found that adding an avatar image to asynchronous situations seemed to generate a sense of emotional involvement and belonging (Taylor, 2011). Perhaps this furthers Denzin’s idea of being in the room together.

The literature describes several options for asynchronous text-based focus groups. Options include, but are not limited to: message boards, blogs, email, listservs, online forums, social networking walls, and interactive websites (Morgan & Lobe, 2011; Oringderff, 2004; Taylor, 2011; Turney & Pocknee, 2005). Like online synchronous and telephone focus group venues, asynchronous text-based focus group venues provide yet another location that has been shown to appeal to hard-to-reach respondents and thus improve diversity (Im & Chee, 2006). The main advantage to the asynchronous focus group format discussed that the nature of written communication allows the participants
time to edit, check, and change their answers to focus group questions before sending their response (James & Busher, 2009; Mann & Stewart, 2000; Walther, 1996), thus providing an informal a priori member check. Member checks are checking the data with members from whom the data were originally collected and seen as the most crucial step for establishing credibility in qualitative studies (Lincoln & Guba, 1985). However, this “edit and check” opportunity may also lead to implications in regards to the data.

Asynchrony has been said to affect the impulsiveness and spontaneity of participant response (Oringderff, 2004). At the extreme, researchers report the sense that participants edited out important details that may have dire repercussions to the data (Davis, Bolding, Hart, Sherr, & Elford, 2004).

In contrast to synchronous focus groups, asynchronous text-based focus groups showed greater response and retention rates with participants indicating this was due to the elimination of schedule conflicts (Im & Chee, 2006). Credibility of the data was increased due to participants typing in their own responses, thus eliminating the need for a transcriptionist (James & Busher, 2009; Stancanelli, 2010). Many also stated it was useful to providing the participant with background content or context by being able to integrate multiple technologies into message board focus groups, such as streaming audio, video, interactive polling, and other multimedia options (Deggs, Grover, & Kacirek, 2010). Increased self-disclosure was also attributed to asynchronous online venues, with participants indicating this was due to increased anonymity (Fox et al., 2007; Joinson, 2001). In a side-by-side comparison of live and blogged student interactions, a focus group showed that students who revealed sensitive information found it was easier to disclose in writing than in person (Harper & Harper, 2006).
Researchers reported negative consequences in several studies due to data security issues and fending off hackers (Tates et. al., 2009). Another highly reported consequence was the loss of “synergy” that accompanies face-to-face interactions and group constructed atmosphere obtained from non-verbal cues, body language, tone of voice, and group interactions (Daymon & Holloway, 2011; Heckman, 2000). Research conducted in Internet-based venues, especially those in asynchronous space are absent of social structures found in face-to-face encounters between researchers and participants in which both parties interpret the social features of the other verbally and non-verbally through gesture, tone of voice, and facial expressions (James & Busher, 2007). An important methodological question is, if a participant can check his or her meanings before offering it to the researcher and a researcher can check meanings throughout the data collection process, how does that impact the meaning-making process in asynchronous research (Williams, Giatsi Clausen, Peacock, & McPherson, 2012)?

**Synchronous text-based venue.** Synchronous text-based focus group venues generally occur in chat rooms or multiple-user instant message windows. While it is often thought that online environments negatively impact the cohesive bonding of focus groups, some have found that was not true (Watson, Peacock, & Jones, 2006). The obvious advantages mirror other non-traditional focus group venues: online focus groups can gather opinions from a widely dispersed population and they tend to be less expensive as they do not require meeting space, refreshments, and travel (Anderson & Kanuka, 2003; Schneider et al., 2002). In a study that was based in an online chat room environment the 12-18 year old mixed-gender participants adjusted quickly and the text-based venue transcended both age and gender (Fox et al., 2007). Further, the researchers
reported the virtual environment might actually encourage youth to be candid and without fear of reprisal, stating:

> Age and gender did not seem to affect the content of pace of communication the speed with which the group bonded illustrates the potentially unique properties of synchronous online communication. The exchange was not hampered by appearance-related clues. (p. 544)

The pitfalls highlighted for online focus groups due to lack of non-verbal cues (body language, eye contact, gestures), lack of paraverbal cues (voice inflections, interjections, and laughter), selection bias as participants self-select to participate, and issues around technological difficulties and computer access (Fox et al., 2007; Tates et al., 2009). Other researchers also report that not as many questions and probes may be asked in the text-based online focus group as would normally be asked in a face-to-face venue due to the time it takes participants to type responses, and also discussions may become fragmented unless the moderator is able to keep all threads in order (Adler & Zarchin, 2002; Kramish-Campbell et al., 2001). Underrepresentation is an added issue with non-Internet users and no-show rates high in focus group chat rooms (Schneider et al., 2002).

**Synchronous voice-based venue.** Another option that appeared in the literature was the use of voice over Internet protocol (VOIP) calling using such software as: Skype, Vonage, Adobe iVisit, or even Gmail. Most of these have options for video conferencing, allowing for the closest representation of the traditional face-to-face focus group venue. It is stated that with videoconferences it is possible to have a large number of people observe the proceedings and communicate with the moderator to ensure that the right information is explored during the focus group (Greenbaum, 1996). This video-based Internet venue allows for a combination of reported face-to-face and online advantages.
Much like face-to-face focus groups, Internet video-based focus group venues allow the feeling of having a moderator in the room, visual cues are seen from moderator and other participants, visual stimulus may be made available, and the video allows for the interplay of group dynamics and building off of others comments (O’Conner & Madge, 2003). The online advantages seen are gaining access to hard-to-reach populations who cannot or will not attend face-to-face sessions; there is no limit to geographic location, cost effectiveness, and the comfort level of being at home (Ayling & Mewse, 2009; Krueger & Casey, 2009; Stewart et al., 2007). For all appearances, the online videoconference venue has the potential to become a new model for focus group venue. A survey reports a growing acceptance of focus group video transmission but cautions that end-user researchers need to insist on audio and video quality and reliability (Houlahan, 2009).

Due to the lack of empirical evidence, it is difficult to fully discern the disadvantages for this venue. Not surprising, research from a decade ago reports that instability of technology as the greatest barrier (Greenbaum, 1996). However, technology has seen vast improvements since that time, so many of these difficulties have been overcome. The few studies reporting evidence stated the problematic aspects encountered for transferring from the traditional face-to-face setting to an online interface included creating a priori designs specific to the Internet, restrictions to sampling for online research, the new skill set needed to interview in the virtual environment, environmental lack of visual cues, and the lengthy gaps of silence in online interviewing, (O’Conner & Madge, 2003; Sue & Ritter, 2012; Wright, 2005).
Testing the Equivalence of Focus Group Venues

As stated earlier, researchers report focus group findings with little or no discussion on the implications of using venues exchangeably or interchangeably with traditional face-to-face focus groups. In essence, this absence of discussion implies researcher belief as to the equivalence between focus group venues. This assumed equivalence is mostly untested in the literature. The purpose of this study was to examine the equivalence or non-inferiority for comparisons of telephone focus group venue to face-to-face focus group venue, Internet video-based focus group venue to face-to-face focus group venue, and Internet video-based focus group venue to telephone focus group venue. However, proving that venues are quintessentially equal is impossible with current statistical tools (Gao & Ware, 2008, Lesaffre, 2008).

Overview of Equivalence and Non-Inferiority Testing

Most studies that use hypothesis testing intend to show that there is a difference between two or more groups (Kohlmann & Moock, 2007). There are times though when a researcher aims to show that there is no statistically significant difference between two groups (Christensen, 2007). For example, in a clinical trial, it may be that a researcher is interested in showing a new and perhaps less expensive drug is just as effective as a standard treatment (Ott & Longnecker, 2010). Even so, failure to reject the null is not reason to claim the two groups are equal but merely that the evidence is inadequate to say they are different; there are statistical strategies to determine when the two groups might
have small enough differences to suggest equivalence (Friedman, Furberg, & DeMets, 2010).

The dissertation study aimed to show whether telephone and Internet focus group venues are as effective as the standard face-to-face focus group venue. Two flavors of equivalence testing found in the literature to address the exchangeability of venues were non-inferiority and equivalence testing. Thus the researcher conducted stepwise hypothesis testing to determine if the test venues established as non-inferior and equivalent to the comparator. As the first step, the researcher performed a one-tailed test of non-inferiority of the treatment venue to the comparator. If non-inferiority was established, then as a second step the researcher conducted two one-tailed tests to determine if the treatment venue was not only non-inferior but also met the criteria for equivalence.

Tests of non-inferiority. The purpose of non-inferiority tests is to demonstrate that the new treatment is not worse than an active comparator by more than a pre-specified amount (Committee for Medicinal Products for Human Use, 2005). In order to determine that data collected through the test venues are not worse than that collected in a comparator venue, the researcher conducted one-tailed tests of non-inferiority for the variables of interest (Schumi & Wittes, 2011). Non-inferiority trials have their history in clinical research to test new treatments when it would be unethical to implement a trial using a placebo (Friedman, et al., 2010). For instance, in cancer trials it would be unethical to use a placebo control when approved and effective therapies are already available (Chow & Shao, 2005). To respond ethically, a non-inferiority test is conducted against the already proven drug. Pocock (2003) defines this:
The term “non-inferiority trial” is commonly used to refer to a randomized clinical trial in which a new test treatment is compared with a standard active treatment rather than a placebo or untreated control group. (p. 483)

While many believe non-inferiority trials are conducted to prove one product is not inferior to the standard product, in actuality a non-inferiority trial aims to demonstrate that a product is not worse than the comparator by more than an inconsequential amount referred to as the non-inferiority margin, or delta (Committee for Medicinal Products for Human Use, 2005; Hwang, 2005; Ng, 2008; Osman & Ghosh, 2011, Tyron & Lewis, 2009). Gao and Ware (2008) explain the reason to select a non-inferiority trial:

Since the control treatment is presumed to be effective, it is assumed not to be necessary to demonstrate that the test treatment is more effective than (superior to) the control treatment. Rather, the test treatment might offer a more convenient formulation, fewer side effects, or other features that make it a legitimate alternative to the established treatment. Thus, the goal of the non-inferiority trial is to demonstrate that the test and comparable treatments are equally effective. (p. 393)

Further explained, the goal of this study was to show the test treatment focus group venues were no worse than the standard focus group venue by the non-inferiority margin. Applied to the current study, the researcher compared the control (face-to-face focus group venue) to the test treatments (telephone and Internet video-based focus group venues in separate tests) and further the two test treatments to each other (telephone and Internet video-based focus group venues). Chow and Shao (2005) explained this process as testing a new therapy to an established efficacious therapy referred to as an active control agent. Stated in Blackwelder’s (1982) the original non-inferiority formula was:

\[ H_0 = II_{ST} - II_{ET} \geq \Delta_{BW} \]  

\[ H_1 = II_{ST} - II_{ET} < \Delta_{BW}. \]
A trial designed in this framework would be successful if the outcome of the test therapy (IIET) was no worse than the outcome of the active control (IIST), by some clinically tolerable amount ($\Delta_{BW}$), usually envisioned as a small fractional part of the effect attributed to the active control (Laster, Johnson, & Kotler, 2005). In this study for $k = 3$, this would signify:

\[
H_0 = II_{face-to-face} - II_{telephone} \geq \Delta_{BW} \\
H_1 = II_{face-to-face} - II_{telephone} < \Delta_{BW} \\
H_0 = II_{face-to-face} - II_{Internet video-based} \geq \Delta_{BW} \\
H_1 = II_{face-to-face} - II_{Internet video-based} < \Delta_{BW} \\
H_0 = II_{telephone} - II_{Internet video-based} \geq \Delta_{BW} \\
H_1 = II_{telephone} - II_{Internet video-based} < \Delta_{BW}.
\]

Meaning, if $H_0$ is met for the first two tests, the treatment (telephone or Internet video-based) is considered non-inferior or no worse than the active control agent (face-to-face) in the sense that the effect of the test therapy when compared with the efficacy of the active control agent is not below the indicated margin (Schumi & Wittes, 2011). Further, if $H_0$ is met for the final test, the treatment (Internet video-based) is considered non-inferior or no worse than the active control agent (telephone). These outcomes could increase researcher assurance of the exchangeability of venues.

**Tests for equivalence.** The intention for equivalence testing is to confirm the absence of a meaningful difference between treatments (Committee for Proprietary Medicinal Products, 2001). To test for equivalence, the researcher must define a range of
differences considered as inconsequential effects. This is referred to in the literature as
the region of equivalence, equivalence zone, or equivalence margin (Tyron & Lewis,
2009). As with non-inferiority, the margin is delta. Different from non-inferiority, where
a one-tailed or one-directional test is conducted, equivalence is tested by implementing
two one-tailed tests: one for the upper margin (Δ) and the second for the lower margin(-Δ). A test that resulted in a conclusion of equivalence would show confidence intervals
that reside between the upper and lower margins. Thus, for the purposes of this study,
once non-inferiority was met, the second tail of the equation was considered for
equivalence. Again the goal of hypothesis testing is to fail to reject the null of statistical
difference between the groups. For \( k = 3 \), there are three pairs of hypothesis for
equivalence:

\[
\{ H_0 = II_{\text{face-to-face}} \leq II_{\text{telephone}} - \Delta: II_{\text{telephone}} \leq II_{\text{face-to-face}} - \Delta \},
\]

\[
\{ H_0 = II_{\text{face-to-face}} \leq II_{\text{Internet video-based}} - \Delta: II_{\text{Internet video-based}} \leq II_{\text{face-to-face}} - \Delta \},
\]

\[
\{ H_0 = II_{\text{telephone}} \leq II_{\text{Internet video-based}} - \Delta: II_{\text{Internet video-based}} \leq II_{\text{telephone}} - \Delta \}.
\]

Röhmel (2011) cautions that a sample standard deviation much higher than expected will
reduce the power of the study, so equal sample sizes are preferred when aiming for
equivalence between pairs. This study made comparisons at the group level giving to the
same number of treatments across samples.

Figure 4 shows an example graph of the outcomes for equivalence testing. The
two solid red horizontal reference lines set the \(-\Delta, \Delta\) set at with a third middle reference
line indicating zero or no difference. The plots show horizontal lines to indicate the lower
and upper bound confidence levels with a large dot to illustrate the mean or test treatment
effect. The tests in the equivalence family have five possible outcomes: equivalence, non-inferiority, inferiority, superiority, and an inconclusive test. If the confidence interval is wholly above zero the conclusion is that the test treatment is superior to the standard. If the confidence interval is entirely above \(-\Delta\) the conclusion is that the test treatment is non-inferior to the standard. Alternately, if the confidence interval is completely below zero the conclusion is that the test treatment is inferior to the standard. To conclude equivalence both confidence interval bounds must be tucked between the margins of \(-\Delta\) and \(\Delta\). The final outcome for an equivalence test happens when the confidence interval straddles over \(-\Delta\) and 0. This represents a trial that has not shown superiority, inferiority, non-inferiority, or equivalence, the conclusion therefore is inconclusive.

Figure 4. Example plot for equivalence testing
Figure 4 is a visual presentation of these outcomes. The first plot shows that the entire confidence interval lies within the equivalence margin (\(-\Delta < x < \Delta\)); thus it may be concluded that the expression is equivalent. The second output shows a span reaching beyond the margins of \(-\Delta\) and 0; thus the researcher would determine this study to be inconclusive. In the middle plot, the confidence intervals range from below zero to less than \(-\Delta\). It may be concluded that the results of this treatment are inferior to the standard. The fourth plot indicates a confidence interval span from above \(-\Delta\) to beyond \(\Delta\); thus a researcher would conclude non-inferiority. The final scenario displays all confidence intervals spanning above \(\Delta\), thus leading to a conclusion of superiority.

**Clinical tolerance.** An important issue in non-inferiority trials is the choice of non-inferiority margins or clinical tolerance, which must be determined a priori (Bloch, Lai, Su, & Tubert-Bitter, 2007). This pre-specified difference is critical to the study design as it is one of the main determiners of sample size and choice of analytic methods (Durkalski & Berger, 2009). Further explained, Span, TenVergert, van der Hilst, & Stolk (2006) state:

> To infer clinical non-inferiority, a “maximally clinically insignificant” difference, or equivalence limit (\(\Delta\)), has to be defined. Several strategies are possible in choosing the value for \(\Delta\), but generally it is accepted that the choice for the region of therapeutic equality should be made by the clinician and should not be made solely on statistical grounds. (p. 262)

Further, the margin must range from “the smallest value that would represent a clinically meaningful difference or the largest value that would represent a clinically meaningless difference” (Wein, 2002, p. 8). Therefore, if \(\Delta\) is too large, rejecting the null in favor of the alternative is meaningless, if too small then the power of the test will be reduced, thus as the difference required decreases, the number of subjects required increases (Russo,
2004). These ideas weighted heavy on this study which has no precedent value to place on $\Delta$. Hence, Le Henanff, Giraudeau, Baron, and Ravaud’s (2006) call for the margin to be based both on statistical reasoning and clinical judgment was employed. Based on researcher judgment a clinical tolerance set at $-5 < x < 5$ for all dependent variables. Thus, to meet non-inferiority the average of the test treatment was no less than 5% below that of the comparator and to meet equivalence the average of the test treatment was no less than 5% below and no greater than 5% above the comparator.

**Conditional Considerations**

This study sought to determine whether focus group venues (face-to-face, telephone, and Internet video-based) were each equivalent to the other, or if the telephone venue was non-inferior to face-to-face, the Internet video-based venue was non-inferior to face-to-face, and if the Internet video-based venue was non-inferior to the telephone venue. Because proof of perfect equivalence is impossible, a pre-stated margin or what might be termed a cut score of the smallest value that would place the scores in the range of equivalence was decided by the researcher. Based on experience, the researcher determined the score thought to be a clinically important effect for each of the five variables of interest. To test for non-inferiority, the non-inferiority margin was set at $-5$. To test for equivalence the marginal range was set at $-5 < x < 5$.

Remembering that non-inferiority is not a symmetric measure, if the comparison group confidence interval lower bound was above the margin of $-5$, then the comparison group showed at least as much efficacy as the reference group, thus meeting the condition to be considered non-inferior to the comparator. In other words, the treatment group
confidence interval lower bound was within the lower margin (Δ) of the comparator. If the comparison group met the non-inferiority criteria, then a confidence interval upper bound of +5 for the same margin in the opposing direction was tested. If the comparison group score was between the two margins of −5 < x < 5 for the comparator, it was determined that the two scores are statistically close enough to be considered equivalent.

**Type I error rate.** There are three major sources of uncertainty when making conclusions from a non-inferiority study: (1) the uncertainty of the active-control effect over a placebo as estimated from historical data, (2) the control effect may change over time violating the assumption of constancy or the historical difference between active-control and placebo, and (3) the risk of making a wrong decision from the test leading to a type-I error (Chang, 2011). This study did not make use of data that allow the examination of the first two areas of uncertainty. However, the risk of making a Type I error was increased to the nature of multiplicity.

**Multiplicity.** Multiplicity is a well-known area of concern for equivalence trials. Statisticians worldwide are concerned with multiple treatment comparisons, multiple outcome variables, composite variables, subgroup analysis and the like (Phillips et al., 2003). Three issues of multiplicity appear in this study. First is the issue of multiple dependent variables within a research question, as can be seen when the variable of interest is measured by both content and linguistic analysis. The second is the issue of multiple dependent variables among research questions, as seen by the inclusion of five dependent variables: participant interactions, breadth of conversation, depth of conversation, disclosure of sensitive information, and adherence to the topic. The final is the use of pairwise comparison tests for more than two groups (n = 3): face-to-face,
telephone, and Internet video-based focus group venues. This study was not interested in a direct comparison of models (issue one), but did seek to resolve issues two and three. For issue two, a correlation matrix was produced to determine the degree the variables of interest were correlated and provide one measure as to the degree of multiplicity among research questions. A Bonferroni adjustment was made to alpha to lessen the likelihood of a Type I error; a full explanation of this adjustment follows in Chapter III.

**Multiplicity within the research question.** Regarding the first issue of multiplicity, multiple dependent variables within a research question, no solution was needed. Parallel tests without multiplicity correction were conducted due to the emphasis on the end conclusions. No statistical comparisons were made between the content analysis and the linguistic analysis and in practice a researcher would not normally conduct both content and linguistic analysis. These two measures tend to reside in different paradigms. Thus, a conceptual comparison of findings is offered, not a statistically weighted interpretation.

**Multiplicity among research questions.** For social science, the current “state of the art” reflects using multiple research questions (Tashakkori & Creswell, 2007). However, in a search for a method to address this area of multiplicity, no consistent standard appears in the social science literature for applying multiplicity adjustments. Table 2 presents a correlation matrix for the seven variables of interest with the knowledge that the higher the correlation; the higher the multiplicity. Some of the most damaging errors arise when researchers perform statistical analysis on non-independent data (Hanson & Bunzl, 2010). For this study, a high correlation, identified as $r \geq 0.7$
(Cohen, Manion & Morrison, 2000), was considered too strong a linear relation for the variables to be considered independent.

Table 2

Correlations Matrix for the Dependent Variables (n = 18)

<table>
<thead>
<tr>
<th>Variables</th>
<th>PI_C</th>
<th>PI_L</th>
<th>BRD</th>
<th>DPTH</th>
<th>DSC_C</th>
<th>DSC_L</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI_C</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI_L</td>
<td>0.4648</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRD</td>
<td>–0.4795*</td>
<td>–0.4027</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPTH</td>
<td>–0.3714</td>
<td>–0.6350**</td>
<td>0.3036</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSC_C</td>
<td>–0.5905**</td>
<td>–0.6645**</td>
<td>0.4720*</td>
<td>0.4963*</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>DSC_L</td>
<td>0.0283</td>
<td>–0.4703*</td>
<td>0.0089</td>
<td>0.5296*</td>
<td>0.1447</td>
<td>1.000</td>
</tr>
<tr>
<td>ADHR</td>
<td>–0.0399</td>
<td>0.3437</td>
<td>–0.1741</td>
<td>–0.3297</td>
<td>–0.1542</td>
<td>–0.2897</td>
</tr>
</tbody>
</table>

*p < 0.05. **p < 0.01.

As can be seen in Table 2, several significant moderate correlations existed between dependent variables. The operationalization of these variables is found in Chapter III. While the researcher attempted to measure completely autonomous dependent variables, significant moderate correlations were found between PI_C and BRD: \( r (18) = –0.4795, p < 0.05 \); PI_C and DCS_C: \( r (18) = –0.5905, p < 0.01 \); PI_L and DPTH: \( r (18) = –0.6305, p < 0.01 \); PI_L and DSC_C: \( r (18) = –0.6645, p < 0.01 \); PI_L and DSC_L: \( r (18) = –0.4703, p < 0.05 \); BRD and DSC_C: \( r (18) = 0.4720, p < 0.05 \);
DPTH and DSC_C: \( r (18) = 0.4963, p < 0.05 \); DPTH and DSC_L: \( r (18) = 0.5296, p < 0.05 \). It seemed reasonable to find that the three variables DPTH, DSC_C, and DSC_L negatively correlated with PI_L. This may be interpreted to mean that as depth and disclosure by both content and linguistic analysis increased, participant interactions decreased. These focus groups were time-limited with the average being 45 minutes and no focus group lasted more than one hour. Therefore, it seems logical to conclude when participants take time to answer questions with in-depth information (DPTH, DSC_C, and DISC_L), then the number of opportunities for participants to converse in an interactive back and forth manner decreased. Similarly, PI_C was negatively correlated with BRD and DSC_C. Thus, as interactions as measured by content analysis increased, the breadth of conversation and disclosure of sensitive information as measured by content analysis decreased.

In contrast, significant positive correlations were found between DSCL_C and BRD: \( r (18) = 0.4720, p < 0.05 \); DSCL_C and DPTH: \( r (18) = 0.4963, p < 0.05 \); and DSCL_L and DPTH: \( r (18) = 0.5296, p < 0.05 \). Breadth showed significant positive moderate correlations with disclosure of information as measured by content analysis. Thus as BRD increased, so did DSC_C. In addition, depth showed significant positive moderate correlations with disclosure of sensitive information for both content and linguistic analysis. Therefore, as DPTH increased, so did the disclosure of sensitive information. Again, it seemed logical that in order for participants to disclose information of a sensitive nature, they would need to use more words (breadth) and deeper layers of meaning (depth) to do so.
ADHR did not demonstrate even moderate correlations of the other dependent variables. Thus, the amount of on-topic conversation did not appear to significantly impact any other variable in the study. It was also interesting that PI_C and PI_L and DSC_C and DSC_L also did not demonstrate a significant correlation. By suggesting independence, the two methods used to analyze the constructs may assist to triangulate the results for participant interactions and disclosure of sensitive information.

Multiplicity of repeated group comparisons. As described in Chapter III, alpha was adjusted to address the multiplicity of pairwise comparisons. The researcher was interested in comparing both test treatment groups (telephone and Internet video-based venues) to the standard (face-to-face), but was also interested in comparing test treatments to each other. This type of repeated use of the data inflates the chance of a Type I error, or the chance of a “false positive.” Hence, the likelihood of incorrectly rejecting the null hypothesis in favor of the alternative is inflated. It has been recognized that performing multiple comparisons with a per-comparison rate of $\alpha = 0.05$ can considerably inflate the probability of making this error, known as the familywise error (FWER) rate and that each of several confidence intervals contains the true treatment is substantially lower than 95% (Proschan & Waclawiw, 2000). At the least, without accounting for the multiple comparisons being conducted, users of the study may draw unwarranted conclusions (Schochet, 2009). For tests involving clinical trials, safety must be ensured. Hence, the FDA regulators will not accept your findings without controlling for the FWER (Burman, Miller, & Wong, 2011).

The analysis for this study included a series of $t$ tests. Each time a $t$ test is run, there is a probability that the null is actually true but will be rejected in error, meaning
there is no relationship between the independent variable and dependent variables (Gau, 2012). In simple terms, the researcher would cry wolf when no wolf is there (Mitchell & Jolly, 2009). This probability of incorrectly rejecting a true null or alpha, attaches to each $t$ test. Thus, when running a series of these, the Type I error rate increases exponentially. When the hypothesis tests are considered together, the combined Type I error rate is inflated. If a researcher ran five independent tests, the chance of finding at least one spurious impact, inflates to 0.23 using the equation $1 - (1 - \alpha)^N$, 0.64 for 20 tests, and 0.92 for 50 tests (Schochet, 2009). The usual recommendation is to reduce the significance level for each test so the FWER Type I error rate stays at the chosen level (Quinn & Keough, 2002). The standard given for clinical trials is to control the Type I error rate at the 5% level with the most common approach using a Bonferroni correction (Burman et al., 2011). To control for multiplicity, the researcher implemented a Bonferroni adjustment for this study, setting alpha at 0.05 and divided by three (0.0167), one for each of the venues studied.

**Data Analysis**

For any piece of research, researchers have to manage their data and begin making sense of it and focus groups are no exception (Liamputtong, 2011). Just as with any other scientific approach, the analysis and interpretation of focus group data requires a great deal of judgment and care (Stewart et al., 2007). Most forms of qualitative research and focus groups in particular, generate large amounts of data (Rabiee, 2004). At some point, many researchers find themselves with a desk of transcripts piled high, wondering what to do with them (Myers & Macnaghten, 1999).
Transcription as Data Analysis

Transcribing audio or video recorded data is usually the first step of focus group data analysis (Stewart et al., 2007). The entextualization of the social into transcription “data” is a hallmark feature of qualitative social science (Bucholtz, 2007a; Slembrouck, 2007; Vigouroux, 2007). In social and human sciences, research often involves making observations and audiotape or videotape recordings of social interaction followed by verbatim transcription, coding, and analysis (Lapadat & Lindsay, 1999). Reliance on transcribed conversations is now the norm for qualitative analysis with some researchers seeing electronic recording transcription as finally allowing “human social interaction to be studied scientifically, since ‘the data’ are preserved and can be reproduced” (Hammersley, 2010, p. 555). However, many researchers view transcription as mechanical and mundane work often paying for the service (Lapadat, 2000). In fact, the trend is reported that the larger the research study, the greater likelihood that someone will be hired to transcribe the research tapes (Tilley, 2003). However, researchers question whether transcription is merely reproducing spoken word or is a practice of representation and part of the analysis process that constructs meaning (Bucholtz, 2007a, Hammersley, 2010). It is believed there are two key issues to transcription: transcribing as an interpretive process and as a representational process, with the following emphasis:

Central to these conceptualizations is the understanding that a transcript is a text that “re”-presents an event; it is not the event itself. Following this logic, what is re-presented is data constructed by a researcher for a particular purpose, not just talk written down. (Green, Franquiz, & Dixon, 1997, p. 172)

Reflection on these ideas in the transcription process is important as a first step of the research process. Although reflection on transcription practice cannot ultimately
overcome methodological difficulties, it may alert scholars to important choices made by
the researcher, the limitations from these, and the socio-political issues that surrounded
and informed those choices (Slembrouck, 2007). The idea of the researcher created
artificial environment is described as “the ironic issue that we have to use artefactualized
simulacra of lived language in order to be able to study it” (Blommaert, 2007, p. 828).

Due to the variation in transcription creation and use based on theoretical
investments, researcher questions, and transcript use, it is important for the researcher to
disclose their analytic perspective (Bucholtz, 2007b). Rejecting the idea of mechanical
transcription, Mondada (2007) states:

A transcript is an evolving flexible object; it changes as the transcriber engages in
listening and looking again at the tape, endlessly checking, revising, reformatting
it. These changes are not simply cumulative steps towards an increasingly better
transcript … a transcript is not an “immutable mobile” (Latour, 1986) …but [that]
to which different properties and meaning are attributed within different practices
of producing, reading, and using them in analysis. (p. 810)

Further, it is impossible to hold in mind the transient, multidimensional, and often
overlapping events on an interaction as they unfold in real-time (Edwards, 2001). In fact,
standardized transcription is thought to aid in handling, comparing, and sharing data, but
language meanings and processes that are situated in time and place, and always
negotiated or emergent, evade such neat description (Lapadat & Lindsay, 1999).

Problematically, despite its centrality in qualitative data collection, transcription practices
remain superficially examined (Oliver, Serovich, & Mason, 2005). To address this need
for transparency, discussion of transcription practice for this study follows in Chapter III.
Common Forms of Qualitative Focus Group Analysis

There are a number of reported approaches for analyzing qualitative data. However, to date there is no single framework provided that delineates the types of qualitative analysis techniques available for focus group analysis (Onwuegbusie et al., 2010). In fact, textbooks claim data analysis in qualitative research remains somewhat of a mystery (Marshall & Rossman, 2006). In practice, most researchers use a combination of approaches (Green & Thorogood, 2004).

How focus group data are analyzed often goes back to such decisions as researcher paradigm and research design. Much as the qualitative researchers range across paradigms, so then do analysis. Marshall and Rossman (2011) present the idea of an qualitative analytic continuum with the far left containing a prefigured technical quasi-statistical approach to analysis and the far right an emergent intuitive immersion technique. Onwuegbusie et al. (2010) suggested four analytical techniques that lend themselves to focus group data: constant comparison analysis, classical content analysis, keywords-in-context, and discourse analysis. Two of these techniques were adopted for this dissertation study: classical content analysis and discourse analysis in the form of linguistic analysis.

Unit of Analysis

Researchers using focus groups for data collection suggest focusing on one of five different measurement levels or units of analysis: the aggregated dataset of all focus groups conducted for a study, subgroups within the focus group study (Collins,
Onwuegbuzie, & Jiao, 2010). Thus for these data a researcher might be interested in comparing data at the state level, each individual focus group as a separate unit, the individual participant level, or at the smallest unit the participant’s individual utterances. However, some argue that responses in a focus group are interdependent due to lack of response from some participants and group pressure from others, making the group itself the unit of analysis (Fern, 2001). Conversely, still others attest to the need for careful consideration to recognize focus group discussions are the product of individuals nested within the group (Hennink, 2007). Along this line, Morgan (1997) went so far to state that “neither the individual nor the group constitutes a separate unit of analysis” but interplay between these two levels of analysis (p. 60). To measure the variables of interest, the researcher located the unit of analysis at the level of focus group (n = 18), which allowed the comparison of focus group venues.

**Dependent Variables**

Researchers select focus groups when collective data are anticipated to increase the quality of evidence on a subject of research (Willis, Green, Daly, Williamson, & Bandyopdahyay, 2009). Fundamental to group data collection is a setting in which participants are encouraged and feel free to openly interact with each other. In such a situation, the researcher is allowed a unique opportunity to experience: responses from multiple participants at one time, participant’s perspectives as they operate within a social network, an opportunity to match nonverbal and verbal cues to the participant’s response, and the immediate ability to probe deeper on the topic of interest (Franklin & Lowry, 2001; Madriz, 2000). Further, focus groups allow participants to react to and build on
comments made by other members of the group, hence potentially enriching the data by increasing insights that might not surface in surveys or one-on-one interviews (Creswell & Plano-Clark, 2007; Dransfield, Marrot, Martin, & Ngapo, 2004). Herewith, the researcher selected dependent variables reported as relevant to collecting data through a focus group venue: participant interactions, the breadth of conversation, the depth of conversation, disclosure of sensitive information, and adherence to the topic.

Measurement of Variables

Two approaches were used to measure the variables of interest: qualitative content analysis and linguistic analysis. Many see these as situated in two paradigms with qualitative content analysis requiring interpretation of the data through the systematic classification process of identifying themes or patterns of core consistencies and meanings (Hsieh & Shannon, 2005; Patton, 2002). In contrast, linguistic analysis eliminates the bias of interpretation by using operational word-based definitions of the variables, using their linguistic markers, and running a statistical analysis of their use in the data (Smith, Dong, & Ren, 2011). The researcher used content analysis to measure participant interactions (RQ1), breadth of conversation (RQ2), disclosure of sensitive information (RQ4), and adherence to the topic (RQ5). After creating operational definitions, the research used linguistic analysis to analyze participant interactions (RQ1), depth of conversation (RQ3), and disclosure of sensitive information (RQ4). This allowed the researcher to measure RQ1 and RQ4 using both content and linguistic analysis, thus providing an approach to triangulate the data. Data analysis triangulation is the
combination of two or more methods of analyzing the data to determine similarities or validate the data (Kimchi, Polivka, & Stevenson, 1991).

**Content Analysis**

Transcriptions were hand coded to conduct a content analysis. Content analysis was administered for only four of the five research questions: RQ1, RQ2, RQ4, and RQ5. No sound content analysis method to measure RQ3, the depth of conversation given by participants, was found in the literature. Consequently, RQ3 is measured by linguistic analysis only.

**Linguistic Analysis**

The transcripts were further analyzed using computerized language analysis software, Linguistic Inquiry and Word Count 2007 student edition (LIWClite7) to obtain linguistic and semantic quantitative information for the variables of interest (Turk, Brown, Symington, & Paul, 2010). The premise of LIWClite7 software analysis is that language may be objectively analyzed (Pennebaker, Booth, & Francis, 2007). LIWClite7 is an advanced word counter that adds text to various categories (Houghton & Joinson, 2012). The software includes a dictionary defining categories that have been rigorously developed and refined over numerous years (Monrouxe & Rees, 2011). LIWClite7 analyzes and classifies in respect to standard linguistic dimensions, psychological processes, relativity, and personal concerns found in its dictionaries (Hirsh, Raymond, & Peterson, 2012; Turk et al., 2010). The dictionaries are the heart of the program, with a dictionary referring to the collection of words that define a particular category (Tausczik
& Pennebaker, 2010). The software reads each word of a designated text file searching the dictionary for a match. If a target word and the dictionary match, the word count for aligning variables is increased (Freitag, Grimm, & Schmidt, 2011). This procedure generates a word count based on the number of words in a submitted text that matched words in the LIWClite7 dictionaries. The scoring system divides the number of words identified in each category by the total number of words in the text sample in order to obtain a percentage of total words that are represented by that category (Owen, Hanson, Preddy, & Bantum, 2011). Use of this tool is a simple procedure in which the automated program analyzes all text simultaneously and almost instantly (Gonzales, Hancock, & Pennebaker, 2010), a fact much appreciated when over 500 pages of transcripts for this study were batch analyzed in under two minutes. All output variables except for word count and words per sentence reflect the percentage of total words.

LIWC was originally constructed by having groups of judges evaluate the degree to which words or word stems related to each of several dozen categories (Mohtasseb & Ahmed, 2010). Over the seven years of development, all of its subjective linguistic categories were assessed and validated by independent groups of raters (Pennebaker & Graybeal, 2001). The initial judging took place between 1992 and 1994, revision judging in 1997, and finally in 2007 to streamline the original program and dictionaries (Tausczik & Pennebaker, 2010). Other text analysis programs are available, but LIWC has been shown to have superior signal detection indices (Bantum & Owen, 2009). As shown, the LIWC categorization process is highly correlated with that of trained judges, indicating good external validity (Hirsh & Peterson, 2009).
Transcriptions were edited and analyzed using linguistic analysis. Linguistic analysis was administered for only three of the five research questions: RQ1, RQ3, and RQ4. No sound method to measure RQ2, the breadth of conversation given by participants, or RQ5, adherence to the topic, was found in the literature. Consequently, RQ2 and RQ5 were measured by content analysis only.

**Importance of Studying the Effects of Focus Group Venue**

Despite the growing number and variations of focus groups conducted each year, insufficient side-by-side research has been completed to examine the comparable differences among focus group venues. Although there is much discussion as to the benefits of one venue over another, sparse research has been conducted on their common and specific ability to elicit content from the participants equal to that obtained through traditional face-to-face venues (Underhill & Olmstead, 2003). A long-time focus group expert, Morgan (2012) implores researchers to consider the decisions they make in regard to research design due to the interconnection between the research’s design and how a group functions stating “although it is up to the participants themselves to initiate and sustain their own discussions, the decisions that we make as researchers can have a major influence on the nature of that discussion” (p. 161). Further, Stewart et al. (2007) warn:

> A focus group that is designed and fielded completely at odds with the method’s core logic is likely to generate questionable results … despite its widespread use; the focus group has been the object of rather little systematic research, particularly in recent years. (pp. 8-9)

It is alarming to note that focus group venue seems to be more often determined by cost and accessibility than appropriateness to the research question. With the growing
availability of technology, many researchers are employing less expensive, telephone-based or Internet-based venues for conducting focus groups.

The current study sought to fill an important gap by providing empirical side-by-side comparisons of focus group results, thus comparing the equivalence of information gathered from three comparable venues of focus groups. As detailed, there is concern that certain venues reported may not meet focus group criteria. Due to this, it was felt the three most closely aligned venues to compare were the face-to-face focus group venue, the telephone focus group venue, and the synchronous online voice-based venue with video feed.
CHAPTER III

METHODOLOGY

This study explored the equivalence between focus group venues. This chapter is broken into sections. Section one presents the research questions. This is followed by the research paradigm. Section three is the research design that includes the use of extant evaluation data, sample, instruments, variables, original evaluation design and statistical test of that design. This chapter concludes with Section four relating the data analysis plan including transcription, content analysis, linguistic analysis, equivalence testing, and non-inferiority testing.

Researchers use focus groups as a tool to gather qualitative data. They are distinguished from the broader category of qualitative data collection tools by the explicit use of group interaction to generate data (Barbour & Kitzinger, 1999; Litosseliti, 2003; Murdoch, Poland, & Salter, 2010). Focus groups allow participants to react to and build on comments made by other members of the group, thus potentially enriching the data by increasing understandings not always manifested in surveys or one-on-one interviews (Creswell & Plano-Clark, 2007; Dransfield et al., 2004). In order to exploit this research tool in full, participants must contribute to group knowledge dissemination through interactions with other participants, disclosing information of interest including that of a sensitive nature, and providing enough topical adherence, coverage, and depth to allow the researcher a full enough understanding from which to draw conclusions.
Similar with other research data gathering, the trend for focus groups is to include technology as a data collection venue. As shown in Chapter II, many researchers report the use of multiple focus group venues interchangeably with no discussion as to how the venue affects data quality and integrity. The literature is nearly silent as to this idea of venue equivalence. This study was interested in how venue affects the fundamental qualitative data extracted from focus groups. Do these alternative venues affect data characteristics either positively or negatively as compared to the traditional face-to-face venue? Specifically, are all focus groups venues equivalent in regards to group interaction, breadth of conversation, depth of conversation, disclosure of sensitive information, and adherence to the topic of interest?

**Research Questions**

In 1964, Marshall McLuan coined the phrase “the medium is the message” thereby acquainting society with the subconscious changes to interpersonal relationships through the introduction of new inventions or innovations into human affairs (p. 7). Thus, the “medium” often results in unintended, unanticipated, and unobvious consequences (Federman, 2004). Further, McLuan (1964) warns against distraction by the content of the medium:

> It is the medium that shapes and controls the scale and form of human association and action. The content or uses of such media are as diverse as they are ineffectual in shaping the form of human association. It is only too typical that the “content” of any medium blinds us to the character of the medium. (p. 9)

Pivotal to this dissertation were the consequences of the introduction of technology-based focus group venues (medium) to the nature and characteristics of the data (message).
Accordingly, the study was interested in measuring whether the application of new focus group venues are indeed similar enough to be considered equivalent or at least “no worse than” the standard face-to-face venue. While there is no direct test to prove perfect equivalence, testing can suggest if the “message” collected from different venues are similar enough to assume equivalence. When equivalence cannot be met, another option is to test to determine if the venue is at least “no worse than” the standard. Clinical medicine refers to this as a non-inferiority trial (Laster & Johnson, 2003; Mascha & Sessler, 2011). The five research questions examined the equivalence and non-inferiority characteristics fundamental to focus groups between test treatment venues and control venue. They were:

1. Are participant interactions in the telephone focus group venue equivalent or non-inferior to face-to-face focus group venue? Are participant interactions in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Are participant interactions in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

2. Is breadth of conversation in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is breadth of conversation in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is breadth of conversation in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?
3. Is **depth of conversation** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **depth of conversation** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **depth of conversation** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

4. Is **disclosure of sensitive information** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **disclosure of sensitive information** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **disclosure of sensitive information** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

5. Is **adherence to the topic** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **adherence to the topic** in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **adherence to the topic** in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

**Study Design**

This study used extant data from an educational evaluation conducted in 2011. The researcher of this dissertation was a member of the evaluation team from which the
extant data were derived. As such, the researcher was interested in exploring how the data may have been influenced by venue choice. Described briefly below are characteristics of the NSTTAC evaluation (Kohler, Gothberg, Coyle, & Peterson, 2011) that had a direct bearing on this dissertation study. The details of the NSTTAC evaluation are presented within to provide a design context or the reader’s benefit.

**Institutional Review Board Approval**

The Human Subjects Institutional Review Board (HSIRB; Appendix A) at Western Michigan University determined that:

Approval is not required for you to conduct this project because you are evaluating a practice to determine the effectiveness of the practice and to provide information for decision-makers (NSTTAC), not to add to generalizable knowledge.

**Extant Data: NSTTAC Evaluation**

This study used extant data derived from a summative evaluation project conducted by the National Secondary Transition Technical Assistance Center (NSTTAC). NSTTAC is a national Technical Assistance and Dissemination center funded from January 1, 2006 through December 31, 2011 by the U.S. Department of Education’s Office of Special Education Programs (OSEP) (Award #H326J050004). One of the primary tasks for NSTTAC is to assist the 50 states and U.S. territories to build capacity for transition education and services, and help youth with disabilities and their families achieve desired post-school outcomes. As part of this model, four states received intensive technical assistance at the state level, and to assist states create model projects,
each state selected a limited number of local school districts to also receive NSTTAC technical assistance. All the local districts in these states identified the need to increase student self-determination skills as one of their primary goals. During the 2008-2009 and 2009-2010 school years, NSTTAC provided intense technical assistance to these districts to support increased student self-determination. To evaluate the impact of their technical assistance on student learning and outcomes, NSTTAC conducted 18 focus groups with students who participated in self-determination curriculum implementation in these local districts. The evaluation included focus groups using three different venues: face-to-face, telephone, and Internet video-based. This dissertation used the de-identified pre-existing data to examine the equivalence and non-inferiority as exemplified in the research questions from data collected through the three different venues.

The current study used extant data; therefore, the NSTTAC team controlled the study design and implementation including instrument development, field-testing, sampling procedures, implementation, data collection, transcription, and original analysis. The transcriptionist deleted all identifying information from the original to create an anonymous dataset for the current project. The details of the original study are included in detail here to allow examination within the framework of the current project.

**NSTTAC Participants**

NSTTAC provided self-determination workshops to over 120 high schools and middle schools in the four states that received intensive technical assistance. NSTTAC determined transition-aged students (ages 16-26) would provide the most information to analyze the effectiveness of the curriculum, so the evaluation was limited to high school
Evaluators choose three of the four states to participate in the focus groups, with one state not participating due to curriculum implementation with students having disabilities that would make it difficult to communicate in a focus group setting. A contact from the state transition planning team was asked to identify schools that implemented the curriculum for at least one semester. A school representative was then contacted and asked to participate. School districts that sent teachers to the self-determination training, implemented that training, and responded to the state request to participate in focus groups had an equal chance of inclusion in the study. The state representative then shared with NSTTAC the names of the districts interested in participating and contact information. NSTTAC staff contacted those willing to participate and sent out student inclusion criteria. Once identified, the district representative selected the individual school and participants from the sample of students who met the criteria to participate in a focus group. NSTTAC had no control over the selection process at individual schools; however, the sample represented a cross-section of students with different ethnicities, disability labels, and socioeconomic status as indicated by free and reduced lunch status. In most cases, all students from a school who met the criteria participated in a focus group according to the design requirements; some schools provided all male groups, all female groups, or mixed gender groups. To be included in the study, the student was required to have participated in self-determination
curricula or lessons, a current individualized education program (IEP), the ability to understand questions and communicate answers, the stamina to participate in a 45-minute focus group, and to be available to participate during the school day. As an incentive, NSTTAC provided pizza to the students. Sixty-four students participated in the focus groups.

NSTTAC Evaluation Design

In order to increase the rigor of the evaluation design by controlling and thereby improving data-based decision making, NSTTAC implemented a $3 \times 3$ Latin Square design (LSD). In LSD, the number of rows, columns, and treatments are always equal with a treatment occurring only once (Agarwal, 2006). The main goal of using Latin squares is to avoid order effects by rotating the order of treatments, so for A, B, and C treatments, where there are three subjects and three orders of treatment, Subject 1 would receive treatments ABC in that order, the order for Subject 2 would be BCA, and so on (Vogt, 2005). Rows and columns are each a complete block within itself; therefore, one can visualize the $3 \times 3$ square as blocks of three treatments both vertically (columns) and horizontally (rows) (van Emden, 2008). Therefore, where rows and columns are parameters to block, each cell is the level of the factor of interest.

The $3 \times 3$ LSD allowed the evaluators to control variation in two directions; e.g., control for two hypothesized confounding sources of variance. LSDs are useful when the factors of interest have more than two levels and it is known ahead of time or assumed that there are no interactions between factors (Hill & Lewicki, 2006). In the LSD as
opposed to a fully crossed factorial design, these interactions are systematically confounded. To complete the LSD design, NSTTAC selected three independent variables. Two factors were controlled—location (state) and gender (groups of all male, all female, and mixed)—to allow the measurement of the variable of interest, focus group venue (face-to-face, telephone, and Internet video-based). The validity of the LSD rests on the assumption of minor or insignificant interactions between gender and location and location and venue. To construct randomized LSD, SAS (9.2) was used to draw factor levels until it exhausted all degrees of freedom, after which row, column, cell selection was completed until all nine possibilities were met. To further increase the rigor, evaluators replicated the LSD study, increasing the number of groups from 9 to 18. It was felt replication strengthened the evidence of study results by conducting the same research study with a different group to determine if the duplication confirms the original findings (Collins, 2010; Hartas, 2010). Replication adds strength and clarity to research findings (Roberts, 2010). If results of the study are replicated a second time, the likelihood that the original study’s findings were obtained spuriously by chance or error is greatly reduced (Hancock & Mueller, 2010; Marczyk, Marczyk, DeMatteo, & Festinger, 2005). In addition, replication allows for greater generalizability of the findings (Aparasu, 2010; Grinnell & Unrau, 2010; Marczyk et al., 2005) including generalizing qualitative research findings (Huberman & Miles, 2002; Johnson & Christensen, 2010) albeit with caution (Morse, 2008; Polit & Beck, 2010; Yin, 2010).

Randomizing a Latin square involves randomly permuting the row, column, and treatment values independently. NSTTAC evaluators used SAS (9.2) [PROC PLAN] to randomize the basic Latin square $3 \times 3$ design (see Appendix D). States were assigned to
rows with 1 = Colorado, 2 = New Mexico, and 3 = Oklahoma. Venues were assigned to columns with 1 = face-to-face, 2 = telephone, and 3 = Internet video-based. Finally the treatments were assigned as 1 = male, 2 = female, and 3 = mixed gender (see Table 3).

Table 3

*3 × 3 Latin Square Study Design for Focus Groups*

<table>
<thead>
<tr>
<th>Face-to-Face</th>
<th>Telephone</th>
<th>Internet Video-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>Male</td>
<td>Mixed</td>
</tr>
<tr>
<td>New Mexico</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>Mixed</td>
<td>Female</td>
</tr>
</tbody>
</table>

**NSTTAC Focus Group Procedures**

NSTTAC recruited four evaluators, two internal, two external, as well as two additional moderators for the project. All members involved in the focus groups understood self-determination concepts and the expectations from participation in a self-determination course, as indicated by their role in special education. NSTTAC project directors and evaluation team members collaborated to identify key questions for the focus groups. They jointly created an interview protocol to include four major evaluation areas that were identified as intended outcomes across all sites: student learning, student participation in the IEP, student behavior and attitude change, and student reflections and recommendations (see Appendix B).

**Universal Design for Evaluation Checklist.** In order to ensure the integrity of the evaluation design for the population under study, the *Universal Design for Evaluation*
Checklist (Sullivan Sulewski & Gothberg, 2012) was utilized (see Appendix C). Checklists are inventories consisting of “factors, properties, aspects, components, criteria, tasks, or dimensions” that guide users (Scriven, 2007, p. 1). Checklists are known to improve compliance, processes, data acquisition, outcomes, and in the medical field, save lives (Gaffney, Harden, & Seddon, 2005; Gawande, 2009; Good, 2006; Henderson, Fung, Bhatt, & Bdesha, 2012; Varela & Brunt, 2012). When applied to evaluation, “checklists provide guidance for the collection of relevant evidence used to determine the merit, worth, or significance of an evaluand” (Martz, 2010, p. 215). Further, Stufflebeam (2000) outlines a number of benefits associated with use of an evaluation checklist, including the ability to clarify criteria, provide a reminder of important criteria, enhance objectivity and reproducibility, and a checklist is useful to help assess an enterprise’s outcomes.

The evaluators were especially aware that the sample population was high school students with disabilities. Accordingly, the checklist was applied during the evaluation design phase to address known and unknown accessibility factors in advance. The checklist was designed to assist the evaluator to include all individuals, people of all ages and all abilities (Sullivan Sulewski & Gothberg, 2012). It was structured according to the seven principles of Universal Design originating in the field of architecture: equitable use, flexible in use, simple and intuitive, perceptible information, low tolerance for error, low physical effort, and size and space for approach and use (Preiser & Smith, 2010). The use of the checklist helped the evaluation team design, develop, and implement the original evaluation and focus group data collection tools in an accessible and inclusive manner that resulted in an evaluation that was able to claim a 98% participation rate.
**Moderator training.** Each focus group was led by a moderator that was experienced with working with people with disabilities, understood self-determination concepts, and understood the intended student outcomes from participation in the self-determination course. In addition to knowing the content, moderators were carefully chosen as someone who would build rapport and trust in the students. It was determined that although the moderators may be employees of the district, they were not to be a classroom teacher, building administrator, or paraprofessional who might make the student uncomfortable with sharing their true perceptions. The moderators included two NSTTAC personnel, two personnel from a university local to the participants, and two local transition specialists who were not directly involved with teaching the student participants.

No formal moderator training was given and moderators were not chosen for their knowledge of the research process. However, moderators were given the standard protocol in advance along with standardized probes for each question and asked to follow the script verbatim (see Appendix C). Prior to the focus group, NSTTAC team members followed up with moderators through email and telephone to ensure understanding and answer questions. It was expected that moderators would ask questions in numeric order and use the scripted probes when needed to gain clarify from the students.

For face-to-face groups, moderators were asked to arrive 15 to 20 minutes in advance to set up and ensure the audio recorders were working. However, NSTTAC provided advanced assistance for all telephone and Skype video-based focus groups. In several districts special technology and permissions had to be set up weeks in advance. At least one week prior to conducting a focus group, a trial run was conducted from the
telephones and computers used in the focus groups. This study asked that students be in different locations for telephone and Internet focus groups. In a couple of instances this was not possible with a limited number of options. Thus for some of the groups all of the students were in separate locations and in some groups students were divided between all possible locations.

In a few focus groups “guests” attended the session to assist with technology, translation, or interpretation, and in one instance to support good student behavior. Moderators were aware this could happen and prepared to share the restrictions in which these guests were welcome. Guests were asked to only translate word-for-word what was said by the moderator and participant. They were encouraged to hold opinions to themselves and not interrupt the flow of conversation. In the case of technology support, schools were asked to restrict support to employees from outside the classroom so students would not feel restricted in what they could and could not share. In all instances where support personnel were included, the support person left the room during the focus group unless a technical problem occurred.

Each focus group session began with an introduction that explained why students were asked to participate, how the data would be used, and how their identities would be protected. Students were then asked to recall the self-determination course and the teacher who taught it. Moderators were given names for these in the event students needed prompting to remember. This was to ascertain that students actually participated in the course and that they remembered participating in the course. At this point, participants were informed the audio recording would begin and moderators led discussions from the standard protocol. At the end of each focus group session, students were asked to share
any information they felt was important but was not addressed by the standard protocol.

Most groups had at least one participate relate information at this time, but that information tended to be very locally and contextually defined.

**Transcription and Operationalization of the Constructs**

In the original study, NSTTAC employed two professional transcriptionists to transcribe audio and videotaped focus groups in the traditional verbatim style. NSTTAC made these available for the current study. To run linguistic analysis of the data, this study required cleaning of the transcripts. The researcher used the de-identified transcripts and hand edited them for linguistic analysis. The transcripts were updated to avoid abbreviations (e.g., U.S., p.e.), acronyms (e.g., IEP, sped), dates (e.g., 3-13, Jan 4), numerals (e.g., 4/15/12, 5 minutes), slang (e.g., gotta, ’cause), noninfluences (huh? um, uh), and filler words (e.g., you know, I mean). Also, the researcher corrected punctuations, eliminated sidebar notes, and transcriber time stamps.

**Independent Variables**

This study adopted the three independent variables from the original evaluation: focus group location, gender of participants, and focus group venue. Previous research has reported that a lack of geographic diversity can affect the generalizability of the research results (Abrams, 2010; Bickman & Rog, 2009; Fern, 2001). In order to maximize the usefulness of the findings to other settings, the original design included 18 focus groups equally divided between three locations: Arkansas ($n = 6$), Colorado ($n = 6$), and Oklahoma ($n = 6$). Previous research showed gender bias in the areas of participant
interaction, depth of conversation, and self-disclosure of sensitive information (Brown, 2004; Fern, 2001; Hollander, 2004; Petronio, 2002; Stewart et al., 2007). Thus, this study controlled the gender mixture of the focus group participants by including an equal number of all male \( n = 6 \), all female \( n = 6 \), and mixed gender groups \( n = 6 \). Finally, the study classified and adopted as the chief variable of interest, focus group venue that included face-to-face groups \( n = 6 \), telephone groups \( n = 6 \), and Internet video-based groups \( n = 6 \).

**Participant interaction.** The main purpose of a focus group is to encourage interactions among and between participants, so a range of views is elicited and discussion generated (Payne, 2007). In Research Question 1, this ability for interaction generation is fundamental to focus groups and researchers may see it as the most important aspect of this data collection tool. Berry and Landry (1997) offered this definition:

> An interaction occurs when you and at least one other person pay attention to one another and adjust your behavior to one another…. A conversation is the clearest example of an interaction. Person A says something. Person B responds, and so forth. (p. 272)

The researcher measured, dependent variable one, PL\_C as participant-to-participant interactions, not participant-to-moderator interactions. Therefore, the total number of interactions was equated by subtracting the number of lines the moderator spoke (MODSPK) from the total number of lines any person spoke (TTLSPK) divided by the number of participants (TTLPRT). The researcher averaged the number of interactions at the focus group level.
Thus, the higher the average score, the greater the participant-to-participant interaction found in a focus group.

RQ1 also employed linguistic analysis to measure participant interactions (PI_L). Interactions are seen as key to social relationships (see Table 4 for LIWC dictionary descriptions). As such, linguistic markers identified as social interactions appear in Social Penetration Theory (Altman & Taylor, 1987). Analysis for PI_L was limited to the default LIWC 2007 dictionary.

Table 4

*Dictionary of Linguistic Markers Attributed to PI_L*

<table>
<thead>
<tr>
<th>Linguist Category</th>
<th>Words in Dictionary</th>
<th>Examples of Words in Dictionary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st person plural</td>
<td>12</td>
<td>we, us, our</td>
</tr>
<tr>
<td>positive emotion</td>
<td>406</td>
<td>love, nice, sweet</td>
</tr>
<tr>
<td>assents</td>
<td>30</td>
<td>agree, yes, okay</td>
</tr>
<tr>
<td>questions</td>
<td>1</td>
<td>sentences ending in “?”</td>
</tr>
</tbody>
</table>

As stated, linguistic analysis was used as a second approach to operationalize participant-to-participant interactions (PI_L). Patterns in language are seen as rich tools for studying interactions, because so much of the interplay between individuals is carried out through language (Tausczik & Pennebaker, 2010). This type of conversation relational linguistic analysis identifies markers for participant interactions as the...
percentage of total words used for the following word categories: 1st person plural pronouns (WE), assents (ASSENT), positive emotions (POSEMO), and questions (QMARKS) (Scholand, Tausczik, & Pennebaker, 2010). These markers were combined to provide a linguistic measure for interaction at the level of focus group.

\[
PI_{L} = \left( \frac{WE + ASSENT + POSEMO + QMARKS}{TTLWRD} \right) \times 100. \tag{5}
\]

**Breadth of information.** One of the key qualities of using focus groups for data collection is the ability to elicit detailed conversations to assist the researcher in a full understanding of the study focus. Social Penetration Theory developed an idea that for relationships and understanding between people to grow, conversation must include dynamics of both breadth and depth (Altman, Vinsel, & Brown, 1981). Both concepts are important to the process of social penetration through sharing a wide range of topics or breadth and personally revealing or detailed information known as depth (Yum & Hara, 2005). Dependent variable three (BRD) was breadth. Breadth was measured as the number of words spoken (WRDS) per idea (IDEAS). Thus, if a participant spoke 100 words during the focus group on 10 different ideas (100/10), he or she would receive a score of 10. Scores were then averaged at the level of focus group.

\[
BRD = \left( \frac{WRDS}{IDEAS} \right). \tag{6}
\]

**Depth of conversation.** Conversations can vary in depth and complexity (Tausczik & Pennebaker, 2010). Depth can range from surface level information in which
a participant only shares demographic information to deeper aspects of core values and beliefs (Houghton & Joinson, 2012). Social Penetration Theory compares depth of conversation to the layers of an onion, with real depth being those inner layers that may bring tears to your eyes (Altman & Taylor, 1987). Although focus group participants may add a lot of surface level information or breadth, it is often harder for a moderator to gain enough trust in one meeting to uncover the inner layers of the onion or depth. Because depth through a hand count or even full content analysis is exceedingly difficult, it was felt the approach to analyze depth of conversation was best operationalized through the use of linguistic markers. Linguistic markers identified for measuring conversational depth comprise the percent of the total number of words that include prepositional phrases, exclusives, conjunctions, and cognitive words a participant uses (Hirsh & Peterson, 2009; Houghton & Joinson, 2012; Pennebaker & Graybeal, 2001; Tausczik & Pennebaker, 2010).

Linguistic markers identified for measuring conversational depth include the percent of the total number of words that include prepositional phrases (PREP), conjunctions (CONJ), exclusives (EXCL), and cognitive words (COGMECH) a participant uses (Hirsh & Peterson, 2009; Houghton & Joinson, 2012; Pennebaker & Graybeal, 2001; Tausczik & Pennebaker, 2010). As can be seen, the researcher combined these variables and divided by TTLWRD to measure dependent variable four (DPTH).

\[
DPTH = \left( \frac{\text{PREP}+\text{CONJ}+\text{EXCL}+\text{COGMECH}}{\text{TTLWRD}} \right) \times 100.
\] (7)
Thus, the researcher combined these variables to measure DPTH (see Table 5 for LIWC dictionary descriptions). Analysis for DPTH was limited to the default LIWC 2007 dictionary.

Table 5

*Dictionary of Linguistic Markers Attributed to DPTH*

<table>
<thead>
<tr>
<th>Linguist Category</th>
<th>Words in Dictionary</th>
<th>Examples of Words in Dictionary</th>
</tr>
</thead>
<tbody>
<tr>
<td>prepositional phrases</td>
<td>60</td>
<td>to, with, above</td>
</tr>
<tr>
<td>conjunctions</td>
<td>28</td>
<td>and, but, whereas</td>
</tr>
<tr>
<td>exclusives</td>
<td>17</td>
<td>but, without, exclude</td>
</tr>
<tr>
<td>cognitive words</td>
<td>730</td>
<td>know, because, should, maybe, always, include</td>
</tr>
</tbody>
</table>

**Disclosure of sensitive information.** Self-disclosure has a long history as a variable of interest to researchers (Greene, Derlega, & Mathews, 2006). However, Chelune’s warning in 1979 that self-disclosure is difficult to measure due to its complexity and the general disagreement over its definition and operationalization stands today (Houghton & Joinson, 2012). Nevertheless, self-disclosure is still seen to provide catharsis, increase social control, and validate perspectives in relational settings (Petronio, 2002) and as such a variable of interest in the study of focus group conversations. For the purpose of this study, disclosure of sensitive information is seen as the act of revealing private information (thoughts, feelings, and experiences) to others (Dindia, 2000) and consequently, this level of demands a certain degree of trust, risk, and vulnerability (Kjeldskov et al., 2004).
Researchers report intentionally using focus groups to solicit disclosure of sensitive information (Miles & Gilbert, 2005). Studies show smaller focus groups are most successful at collecting information of a sensitive nature (Bloor et al., 2001). The groups in this study ranged from three to seven participants. In addition, the participants were 16-21 years of age and researchers report this age range is known to disclose sensitive personal information in focus groups with their peers (Oliveira, 2009). However, depending on the perceived consequences, participants may disclose or withhold information weighing the benefits and risks (Miles & Gilbert, 2005). Risks include giving information to the wrong people, sharing information at inappropriate times, and giving too much information (Gerber & Price, 2012). This study asked participants to reveal information about themselves in six areas: (1) disclosure of disability (DDIS), (2) affects of disability (ADIS), (3) disclosure of need for accommodations (DNEED), (4) disclosure of personal accommodations needed (DACCM), (5) disclosure of changes in attitudes and behavior (DATTBR), and (6) disclosure of personal stories (DSTRY) that collectively can represent the disclosure of sensitive information. To determine level of disclosure, each participant scored a zero (no disclosure) or a one (disclosed) in each area yielding a maximum score (DISTTL) of six per participant over the entire focus group period. For dependent variable five (DISCLOS_C), the researcher combined these scored and divided by the maximum score DISTTL to determine the amount of disclosure at the level of focus group.

\[
DSC_C = \left( \frac{DDIS+ADIS+DNEED+DACCM+DATTBR+DACCM}{DISTTL} \right) \times 100. \tag{8}
\]

Hence, the higher the average score, the greater the disclosure of sensitive information.
Linguistic analysis provided an additional measure for the variable of interest, disclosure of sensitive information (DSC_L). In their study on secrets, Houghton and Joinson (2012) identified 16 linguistic markers relating to sensitive self-disclosure including: personal pronouns, social words used to describe relationships, affective processes showing emotion, cognitive processes in which the participant illustrates cause and effect, perceptual processes, biological processes, relativity, and personal concerns: dealing with work, leisure activities, personal achievements, home, money, religion, and death. Thus, linguistic markers identified for measuring conversational depth are the percent of the total number of words that include: functional words of personal pronoun use (FNCT), social words used to describe relationships (SCL), affective processes showing emotion (AFT), cognitive processes (COG) in which the participant illustrates cause and effect, relativity (RTV), perceptual processes (PP), biological processes (BIO), and personal concerns (PRCN) dealing with work, describing leisure activities, personal achievements, home life, money, religion, and death (Bantum & Owen, 2009; Hirsh & Peterson, 2009; Houghton & Joinson, 2012; Joinson & Paine, 2007; Newton, Kramer, & McIntosh, 2009; Spiekermann, Grossklags, & Berendt, 2001). The researcher combined these and divided by the total number of words (TTLWRD). These were then averaged at the level of focus group.

\[
\text{DSC}_L = \left( \frac{\text{FNCT} + \text{SCL} + \text{AFT} + \text{COG} + \text{RTV} + \text{PP} + \text{BIO} + \text{PRCN}}{\text{TTLWRD}} \right) \times 100. \tag{9}
\]
As shown, the researcher combined the 16 linguistic markers and divided by the total word count to measure DCS_L (see Table 6 for LIWC dictionary descriptions). Analysis for DSC_L was limited to the default LIWC 2007 dictionary.

Table 6

Dictionary of Linguistic Markers Attributed to DSC_L

<table>
<thead>
<tr>
<th>Linguist Category</th>
<th>Words in Dictionary</th>
<th>Examples of Words in Dictionary</th>
</tr>
</thead>
<tbody>
<tr>
<td>functional words</td>
<td>464</td>
<td>I, me, we, us, they, she, him</td>
</tr>
<tr>
<td>social processes</td>
<td>455</td>
<td>talk, family, friend, neighbor, baby</td>
</tr>
<tr>
<td>affective processes</td>
<td>915</td>
<td>happy, hurt, worried, nervous, annoyed, sad</td>
</tr>
<tr>
<td>cognitive processes</td>
<td>730</td>
<td>know, because, should, maybe, always, include</td>
</tr>
<tr>
<td>perceptual processes</td>
<td>273</td>
<td>heard, feel, saw, listen, feel, touch</td>
</tr>
<tr>
<td>biological processes</td>
<td>567</td>
<td>eat, hands, flu, love, eat, pain</td>
</tr>
<tr>
<td>relativity</td>
<td>638</td>
<td>motion, space, time</td>
</tr>
<tr>
<td>personal concerns</td>
<td>62-327</td>
<td>work, leisure, home, money, religion, death</td>
</tr>
</tbody>
</table>

Adherence to the topic. The researcher experience previous studies that showed a difference in off-topic conversations between venues. At times, it was difficult for the moderator to bring participants back to focus questions, thus limiting the utility. Off-topic conversation, by virtue of its name, does not address the topic in which the participants are asked to engage (Cade, Lehman, & Olney, 2010). Therefore, the researcher felt it important to measure topic adherence as Research Question 5. For this purpose, the
researcher dichotomously scored each line of text as either on-topic (ONT) or off-topic (OFFT) as in the following example:

Moderator: Please describe a time you told someone about your disability.

Participant 1: Since taking this class, I told my boyfriend (ONT)

Moderator: You mean he didn’t already know?

Participant 2: Brandy doesn’t tell him about a lot of thing (OFFT)

Participant 3: Yeah remember the time we went to the beach? (OFFT)

Participant 1: Uh and like he found out, he was so mad (OFFT)

Participant 3: I can’t believe he didn’t break up (OFFT)

Moderator: Brandy, how did he react when you told him about your disability?

Note that moderator’s verbalizations are not included in this coding framework. The previous passage shows one on-topic line, four off-topic lines, and five lines of participant text. To determine adherence to the topic at the level of focus group the percent of on-topic conversation as the total number of lines on-topic (ONT) was divided by the total number of lines (TTLLN) multiplied by 100. These were then averaged at the level of focus group.

\[ ADHR = \left( \frac{ONT}{TTLLN} \right) \times 100. \]  

(10)

Therefore, the higher the total percentage score, the greater the adherence to the topic. The example above would score 1/5 or 20% on-topic conversation.
Study Analysis

Before proceeding with the current study, the data from the evaluation study were analyzed to determine if the replications could be combined. Due to the nature of the LSD design, the number of degrees of freedom is small thus to strengthen the design and add statistical power, the LSD was replicated a second time using an identical $3 \times 3$ design with additional participants. Further, it was hoped that the replicated design would be statistically similar to allow the two replications to be collapsed into one design increasing the degrees of freedom.

Because of the restricted layout, one observation per treatment in each row and column, the model is orthogonal, meaning, if the row and column effects are random, the treatment effects and treatment means are orthogonal to the row and column effect. Row and column effects may be tested and are often included to reduce the error variation but the focus of interest in a Latin square design is on the treatments (Montgomery, 2009). Using the SAS (9.2) program for general linear models [PROC GLM], it was found that differences in the mean responses between treatment groups for content analysis and linguistic analysis for all variables of interest were both similar and found as not statistically different across replicates (see Table 7). Thus, the researcher was confident to move forward with a combined analysis.

Statistical Analysis

Data from content and linguistic analysis were imported from Excel into SAS (9.2) for statistical analysis. As a first step in analysis a general linear test was conducted
Table 7

*General Linear Model to Test for Combining Replications*

<table>
<thead>
<tr>
<th></th>
<th>PI_C</th>
<th>PI_L</th>
<th>BRD</th>
<th>DPTH</th>
<th>DSCL_C</th>
<th>DSCL_L</th>
<th>ADHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Total ($df = 17$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS</td>
<td>429.67</td>
<td>174.37</td>
<td>8356.44</td>
<td>233.26</td>
<td>8826.49</td>
<td>982.58</td>
<td>148.29</td>
</tr>
<tr>
<td>Error ($df = 10$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>34.66</td>
<td>10.31</td>
<td>330.19</td>
<td>12.19</td>
<td>409.68</td>
<td>81.82</td>
<td>11.48</td>
</tr>
<tr>
<td>Model ($df = 7$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>11.86</td>
<td>10.18</td>
<td>722.08</td>
<td>15.90</td>
<td>675.67</td>
<td>23.48</td>
<td>4.79</td>
</tr>
<tr>
<td>$F$</td>
<td>0.34</td>
<td>0.99</td>
<td>2.19</td>
<td>1.30</td>
<td>1.65</td>
<td>0.29</td>
<td>0.42</td>
</tr>
<tr>
<td>$p$</td>
<td>0.92</td>
<td>0.49</td>
<td>0.13</td>
<td>0.33</td>
<td>0.23</td>
<td>0.94</td>
<td>0.87</td>
</tr>
</tbody>
</table>

to determine if the two replicates ($n = 9$) were not significantly different, thus allowing the researcher to combine datasets and increase power by increasing the sample size ($n = 18$). As seen in previously, no $p$ values at the model level showed a statistically significant difference allowing the researcher to combine the two replicates. A one-tailed $t$ test was conducted to determine non-inferiority. If non-inferiority was met, then an analysis to test for equivalence was run. A common method used for equivalence testing between two treatments is to perform two one-sided tests (TOST) (Schuirmann, 1987). Accordingly, a $t$ test implementing TOST was conducted to determine if the criteria for equivalence was met. For equivalence and non-inferiority measures, a $t$ test was conducted with alpha set at 0.05, confidence set at 95% for the two-tailed equivalence test and 97.5% for the one-tailed non-inferiority test, and tolerance set at a five-point
difference. Thus, if focus groups were within five points difference positive or negative, they were considered equivalent for that variable. Further, if a group was not found equivalent but the confidence interval lower bound for the test treatment was greater than \(-5\), the test treatment was considered as non-inferior to the standard.

**Multiplicity Adjustment**

Literature poses several solutions for adjusting the Type I error rate for multiplicity but converge to three approaches: a Bonferroni, a Bonferroni-Holms, and a Benjamini-Hochberg. Often these are reported with no discussion as to the selection. As seen by the What Works Clearinghouse (2011), some adopt one over the other without cautioning the researcher to consider the appropriateness of the adjustment choice to a particular dataset or research design. Statistical literature, such as that found in biostatistics, suggest that the Bonferroni needs to be applied with caution as it tends to be the most conservative measure and leads to a loss of power.

The data used for this dissertation were from a study that implemented a strong Latin square design that included a replication. It was felt that a little sacrifice in statistical power resulting from a Bonferroni adjustment could be tolerated given the strong design strategy. Thus, to control for the issue of multiplicity, a Bonferroni adjustment was made using the formula $\frac{\alpha}{0.5k(k-1)}$ where $k =$ number of groups. As previously stated, alpha was set at 0.05 and $k = 3$, making the formula $0.05/0.5*3 (3–1)$ or $0.05/3 = 0.0167$. A focus group that was deemed not equivalent but was above the negative value for the lower confidence interval was then considered non-inferior for that
variable. Finally, the plot procedure was conducted to visually understand the data by plotting the means and confidence intervals for each variable of interest.
CHAPTER IV

RESULTS

This chapter presents the participant demographics and results of data analysis for this study. Section one presents participant demographics. This is followed by the conditional considerations. Finally, Section three presents results for the research questions.

Participant Demographics

Each focus group member \((n = 64)\) participated in a high school self-determination course taught as part of his or her special education program. Therefore, students who participated in self-determination courses were on an Individualized Education Program (IEP) indicating 100% of participants had a school-recognized disability. However, students had an option whether or not to disclose their disability label. Students that opted to report \((n = 51)\) had school assigned disability labels of: autism spectrum disorder \((3.92\%, n = 2)\), emotionally impaired \((1.96\%, n = 1)\), hearing impaired \((1.96\%, n = 1)\), mentally retarded \((1.96\%, n = 1)\), otherwise health impaired \((19.61\%, n = 10)\), physical disability \((3.92\%, n = 2)\), specific learning disability \((64.71\%, n = 33)\), and traumatic brain injury \((1.96\%, n = 1)\).

Demographic characteristics of participants by focus group venue are presented in Table 8 for gender and high school grade. Overall participation favored males \((53.13\%, n = 34)\),
\( n = 34 \) over females \((46.87\%, n = 30)\), which closely mirrors the general population, where males are referred to special education services at a slightly higher rate than females (Wehmeyer & Schwartz, 2001). In addition, Table 8 also provides descriptive statistics for grade level. The majority of students participating in the focus groups ranged from 10\(^{th}\) – 12\(^{th}\) grade (94.54%). With most states providing special education services until age 21, this placed the participants between 16 and 21 years of age.

Table 8

*Descriptive Statistics for Gender and Grade by Venue and Replicate \((n = 64)\)*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Face-to-Face</th>
<th>Telephone</th>
<th>Internet</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( n ) ((%))</td>
<td>( n ) ((%))</td>
<td>( n ) ((%))</td>
<td>( n ) ((%))</td>
</tr>
<tr>
<td>Female</td>
<td>12 ((18.75))</td>
<td>9 ((14.06))</td>
<td>9 ((14.06))</td>
<td>30 ((45.31))</td>
</tr>
<tr>
<td>Male</td>
<td>9 ((14.06))</td>
<td>9 ((14.06))</td>
<td>16 ((25.00))</td>
<td>34 ((54.69))</td>
</tr>
<tr>
<td>Total</td>
<td>21 ((32.81))</td>
<td>18 ((28.13))</td>
<td>25 ((39.06))</td>
<td>64 ((100.00))</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>( n ) ((%))</th>
<th>( n ) ((%))</th>
<th>( n ) ((%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>9(^{th})</td>
<td>1 ((1.82))</td>
<td>1 ((1.82))</td>
<td>0 ((0.00))</td>
</tr>
<tr>
<td>10(^{th})</td>
<td>7 ((12.73))</td>
<td>5 ((9.09))</td>
<td>4 ((7.27))</td>
</tr>
<tr>
<td>11(^{th})</td>
<td>4 ((7.27))</td>
<td>6 ((10.91))</td>
<td>7 ((12.73))</td>
</tr>
<tr>
<td>12(^{th})</td>
<td>5 ((9.09))</td>
<td>6 ((10.91))</td>
<td>8 ((14.55))</td>
</tr>
<tr>
<td>Grad</td>
<td>0 ((0.00))</td>
<td>0 ((0.00))</td>
<td>1 ((1.82))</td>
</tr>
<tr>
<td>Total</td>
<td>17 ((30.91))</td>
<td>18 ((32.73))</td>
<td>20 ((36.36))</td>
</tr>
</tbody>
</table>

*Note.* Grade missing = 9

In addition, some students opted to share their socio-economic status as reported in free and reduced lunch and ethnicity from their school records. Of those that opted to
report socio-economic status \((n = 24)\), school records revealed 58.54% qualified for reduced or free lunch. School records for students that opted to share ethnicity \((n = 38)\) showed 79.32% as White not Hispanic, 13.16% as Hispanic or Latino, 7.89% as Black not Hispanic, and 2.63% as American Indian.

**Research Question 1**

Research Question 1 (RQ1) asked, *Are participant interactions for the test treatments equivalent or non-inferior to the comparator?* RQ1 had three subcomponents comparing telephone to face-to-face focus group venues, Internet to face-to-face focus group venues, and Internet to telephone focus group venues. Two methods were used to analyze this variable: content analysis and linguistic analyses. Specifically the questions were:

- Are *participant interactions* in the telephone focus group venue equivalent or non-inferior to face-to-face focus group venue?
- Are *participant interactions* in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue?
- Are *participant interactions* in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

PI_C

Participant interactions were measured using the content analysis described in Chapter III. As outlined, the researcher tallied the number of lines spoken per focus group
and subtracted the number of moderator lines spoke. This total was divided by the number of participants in the focus group to measure participant interaction.

The results from the $t$ test using TOST indicated different results for each of the pairwise comparisons (see Table 9). The results from the $t$ test using TOST indicated non-equivalence when comparing participant interactions in the face-to-face and telephone focus group venues. Even more, the results suggested that telephone focus group venues may be inferior to face-to-face with the CI upper bound below 0 and the lower bound stretching below the lower margin ($96\% \ CI = -30.166 \leq II_1 - II_2 \leq -6.631$). Further testing may be of interest to determine if telephone focus groups are indeed inferior to face-to-face focus group venues for participant interactions. The results from the $t$ test using TOST were inconclusive when comparing participant interactions in the face-to-face and Internet video-based focus group venues with both the CI upper and lower bounds ranging above 0 and below the lower margin ($96\% \ CI = -25.310 \leq II_1 - II_2 \leq -6.631$). In conclusion, as seen in Figure 5, results for equivalence testing suggested non-inferiority for the comparison of Internet video-based and telephone focus group venues ($96\% \ CI = -2.607 \leq II_2 - II_3 \leq 15.893$). Given that, the second more stringent one-tailed non-inferiority test was conducted. Results for non-inferiority confirmed the findings of equivalence testing for Internet video-based and telephone focus group venues with the CI lower bound above the lower margin for clinical tolerance ($98.33\% \ CI = -4.123 \leq II_1 - II_2 \leq 17.409$). Thus, for all pairwise comparisons of $PI_C$, the tests indicated non-equivalence and suggested inferiority for the comparison of face-to-face and telephone focus group venues, tests were inconclusive for face-to-face and
Internet video-based focus group venues, and Internet video-based was found to be non-inferior to telephone focus group venues.

Table 9

**Participant Interactions as Shown by Content Analysis**

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>−18.399</td>
<td>−30.166</td>
<td>−6.631</td>
<td>Non-equivalent, inferior suggested</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>−11.756</td>
<td>−25.310</td>
<td>1.799</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>6.643</td>
<td>−2.607</td>
<td>15.893</td>
<td>Non-equivalent, non-inferior</td>
</tr>
</tbody>
</table>

*Figure 5. SGPlots of participant interactions for content analysis*
**PL_L**

Participant interactions were measured using the linguistic analysis described in Chapter III (see Table 10). As such, the percentage of words attributed to person plural pronouns, assents, positive emotions, and questions were analyzed. PL_L yielded different results than content analysis for participant interactions.

The results were inconclusive when comparing PL_L in the face-to-face and telephone focus group venues with the CI upper bound below the upper margin of clinical tolerance, but the CI lower bound stretching below the lower margin (96% CI = –7.193 ≤ II₁ – II₂ ≤ 3.543). The inconclusive results were also shown for the comparison of face-to-face and Internet video-based with the CI upper bound below the upper margin of clinical tolerance but the CI lower bound stretching below the lower margin (96% CI = –6.087 ≤ II₁ – II₂ ≤ 4.748). In conclusion, as seen in Figure 6, results for equivalence testing suggested both equivalence and non-inferiority for the comparison of Internet video-based and telephone focus group venues with the CI lower bound above the lower margin for clinical tolerance and the CI upper bound below the upper margin for clinical tolerance (96% CI = –1.729 ≤ II₂ – II₃ ≤ 4.040). A more stringent one-tailed t test for non-inferiority was conducted. Results for the one-tailed t test for non-inferiority confirmed the findings of the t test using TOST equivalence testing for Internet video-based and telephone focus group venues with the CI lower bound above the lower margin for clinical tolerance and the CI upper bound below the upper margin for clinical tolerance (98.33% CI = –2.201 ≤ II₁ – II₂ ≤ 4.513). Thus, for all pairwise comparisons of PL_L, the tests were inconclusive for the comparisons of face-to-face and telephone...
### Table 10

**Participant Interactions as Shown by Linguistic Analysis**

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>-1.825</td>
<td>-7.193</td>
<td>3.543</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>-0.670</td>
<td>-6.087</td>
<td>4.748</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>-1.156</td>
<td>-1.729</td>
<td>4.040</td>
<td>Equivalent, non-inferior</td>
</tr>
</tbody>
</table>

**Figure 6.** SGPlots of participant interactions for linguistic analysis

Focus group venues and face-to-face and Internet video-based focus group venues; however, Internet video-based was found to be both equivalent and non-inferior to face-
Research Question 2

Research Question 2 (RQ2) asked, *Is breadth of conversation for the test treatments equivalent to the comparator?* RQ2 had three subcomponents comparing telephone to face-to-face focus group venues, Internet to face-to-face focus group venues, and Internet to telephone focus group venues. Only the content analysis method was used to analyze this variable. Specifically the questions were:

- Is breadth of conversation in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue?
- Is breadth of conversation in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue?
- Is breadth of conversation in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

BRD

Breadth of conversation (BRD) was limited to content analysis (see Table 11). As described in Chapter III, the researcher divided the number of ideas participants generated during a focus group by the number of words participants produced to measure BRD. Thus, if a group generated 10 ideas and used 300 words to describe those ideas, they would score a 30.
The results were inconclusive when comparing BRD in the face-to-face and telephone focus group venues with the CI lower bound stretching well below the lower margin and the CI upper bound well above the upper margin of clinical tolerance ($96\% \ CI = -10.649 \leq II_1 - II_2 \leq 33.927$). Inconclusive results were also shown for the comparison of telephone and Internet video-based with the CI lower bound stretching below the lower margin and the CI upper bound well above the upper margin of clinical tolerance ($96\% \ CI = -9.375 \leq II_1 - II_2 \leq 53.006$). However, as seen in Figure 7, results for equivalence testing suggested non-inferiority for the comparison of face-to-face and Internet video-based focus group venues with the CI lower bound above the lower margin for clinical tolerance and the CI upper bound well above the upper margin for clinical tolerance ($96\% \ CI = 4.455 \leq II_2 - II_3 \leq 62.454$). A more stringent one-tailed $t$ test for non-inferiority was conducted. Results for the one-tailed $t$ test for non-inferiority confirmed the findings for face-to-face and Internet video-based focus group venues with the CI lower bound above the lower margin for clinical tolerance and the CI upper bound again well above the upper margin for clinical tolerance ($98.33\% \ CI = -0.300 \leq II_1 - II_2 \leq 67.208$). Thus, for all pairwise comparisons of PI_L, the tests were inconclusive for the comparisons of face-to-face and telephone focus group venues and telephone and Internet video-based focus group venues; however, Internet video-based was found to be non-inferior to face-to-face focus group venues for the breadth of conversation as measured by content analysis.
### Table 11

**Breadth of Conversation as Shown by Content Analysis**

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>11.639</td>
<td>−10.649</td>
<td>33.927</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>33.454</td>
<td>4.455</td>
<td>62.454</td>
<td>Non-equivalent, non-inferior</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>21.815</td>
<td>−9.375</td>
<td>53.006</td>
<td>Non-equivalent, inconclusive</td>
</tr>
</tbody>
</table>

**Figure 7.** SGPlots of breadth of conversation for content analysis
Research Question 3

Research Question 3 (RQ3) questioned whether depth of conversation for the test treatments were equivalent to the comparator. RQ3 had three subcomponents comparing telephone to face-to-face focus group venues, Internet to face-to-face focus group venues, and Internet to telephone focus group venues. Only the linguistic analysis method was used to analyze this variable. Specifically the questions were:

Is depth of conversation in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is depth of conversation in synchronous Internet video-based focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is depth of conversation in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

DPTH

Depth of conversation (DPTH) was restricted to linguistic analysis, as described in Chapter III. The linguistic markers associated with prepositional phrases, conjunctures, exclusions, and cognitive mechanical words were analyzed with the LIWClite07 software. The researcher then divided this total by the total number of words to create a percentage of words identified to create DPTH.

Results of $t$ tests using TOST suggested non-inferiority between the telephone and face-to-face focus group venues ($96\% \text{ CI } = -3.245 \leq II_1 - II_2 \leq 8.797$), and Internet video-based and face-to-face focus group venues ($96\% \text{ CI } = -2.657 \leq II_1 - II_3 \leq 6.739$).
However, the results for Internet video-based and telephone focus group venues (96% CI $=-5.483 \leq \Pi_2 - \Pi_3 \leq 4.374$) were inconclusive with the CI lower bound just below the lower margin of clinical tolerance (see Table 12).

Given that the results of equivalence testing for telephone and Internet video-based, both suggested non-inferiority to face-to-face focus group venues with the CI lower bound above the lower margin of clinical tolerance, a second more stringent one-tailed $t$ test was run (see Figure 8). Results for non-inferiority confirmed the findings of equivalence testing for telephone and face-to-face focus group venues ($98.33\% \, CI = -4.232 \leq \Pi_1 - \Pi_2 \leq 9.784$) and Internet video-based and face-to-face focus group venues ($98.33\% \, CI = -3.427 \leq \Pi_1 - \Pi_3 \leq 7.510$). Thus, for all pairwise comparisons of DPTH, the test was inconclusive for the comparisons of telephone and Internet video-based focus group venues; however, telephone and Internet video-based were found non-inferior to face-to-face focus group venues for the depth of conversation as measured by linguistic analysis.

Table 12

*Depth of Conversation as Shown by Linguistic Analysis*

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>2.776</td>
<td>–3.245</td>
<td>8.797</td>
<td>Non-equivalent, non-inferior</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>2.041</td>
<td>–2.657</td>
<td>6.739</td>
<td>Non-equivalent, non-inferior</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>–0.735</td>
<td>–5.843</td>
<td>4.374</td>
<td>Non-equivalent, inconclusive</td>
</tr>
</tbody>
</table>
Research Question 4

Research Question 4 (RQ4) asked, *Is disclosure of sensitive information for the test treatments equivalent or non-inferior to the comparator?* RQ4 had three subcomponents comparing telephone to face-to-face focus group venues, Internet to face-to-face focus group venues, and Internet to telephone focus group venues. Both content and linguistic analysis was used to analyze this variable. Specifically the questions were:

Is **disclosure of sensitive information** in the telephone focus group venue equivalent or non-inferior to the face-to-face focus group venue? Is **disclosure of sensitive information** in synchronous Internet video-based focus group venue
equivalent or non-inferior to the face-to-face focus group venue? Is disclosure of sensitive information in synchronous Internet video-based focus group venue equivalent or non-inferior to the telephone focus group venue?

DSC_C

Disclosure of sensitive information (DSC_C) was measured using the content analysis as described in Chapter III. DSC_C was measured dichotomously on six areas for disclosure of sensitive information. If a participant revealed sensitive information in an area they received a score of one, otherwise they received a zero. These measures were aggregated, divided by six, and multiplied by 100 for an overall percent score.

Results from equivalence testing suggested non-inferiority and perhaps superiority of telephone as compared to face-to-face focus group venues (96% CI = 7.797 \(\leq\) II_1 – II_2 \(\leq\) 65.165) with the CI lower bound well above the upper margin of clinical tolerance. However, as shown in Table 13, Internet video-based compared to face-to-face (96% CI = –17.958 \(\leq\) II_1 – II_2 \(\leq\) 51.370) and Internet video-based compared telephone focus group venues proved inconclusive (96% CI = –43.175 \(\leq\) II_1 – II_2 \(\leq\) 3.625). Therefore, the researcher conducted a stricter one-tailed test to determine non-inferiority. As shown in Figure 9, non-inferiority was held in the stricter test of telephone focus group venue as compared to face-to-face focus group venue, as did the suggested superiority resulting in a CI lower bound above 0 with the CI upper bound well above the upper margin of clinical tolerance (98.33% CI = 3.095 \(\leq\) II_1 – II_2 \(\leq\) 69.867). However, superiority telephone focus group venue over face-to-face focus group venue is not assumed as testing this was beyond the scope of this dissertation. Further testing is encouraged to
Table 13

**Disclosure of Sensitive Information as Shown by Content Analysis**

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>36.481</td>
<td>7.797</td>
<td>65.165</td>
<td>Non-inferior, superior suggested</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>16.706</td>
<td>-17.958</td>
<td>51.370</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>-19.775</td>
<td>-43.175</td>
<td>3.625</td>
<td>Non-equivalent, inconclusive</td>
</tr>
</tbody>
</table>

*Figure 9. SGPLOTS of disclosure of sensitive information for content analysis*
determine if a test of superiority would also hold. Thus, for all pairwise comparisons, results were inconclusive for Internet video-based focus group venue compared to face-to-face and telephone focus group venues. However, the telephone was found non-inferior to face-to-face focus group venues and confirmed with the stricter test for non-inferiority.

**DSC\_L**

For these questions disclosure of sensitive information was measured using the linguistic analysis as described in Chapter III. The linguistic markers associated with this variable included the percentage of functional, social, affective, cognitive, relativity, perceptual, biological, and personal words a participant used during the focus group were analyzed with the LIWClite07 software. The researcher then divided this total by the total number of words to create a percentage of words identified to create DSC\_L.

Results from the $t$ test using TOST were inconclusive for all pairwise comparison (see Table 14). Thus no conclusion was reached for the comparison of telephone focus group venue and face-to-face focus group venue with the CI lower bound below the lower margin for clinical tolerance and the CI upper bound well above the upper margin for clinical tolerance ($96\% \, CI = -9.496 \leq \Pi_1 - \Pi_2 \leq 17.096$). As seen in Figure 10, the test was inconclusive for Internet video-based focus group venue and face-to-face focus group venue with the CI lower bound below the lower margin for clinical tolerance and the CI upper bound well above the upper margin for clinical tolerance ($96\% \, CI = -11.015 \leq \Pi_1 - \Pi_2 \leq 14.520$). The comparison of telephone focus group venue and Internet video-based focus group venue was also inconclusive with the CI lower bound below the lower
Table 14

*Disclosure of Sensitive Information as Shown by Linguistic Analysis*

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>3.800</td>
<td>-9.496</td>
<td>17.096</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>1.753</td>
<td>-11.015</td>
<td>14.520</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>-2.047</td>
<td>-8.419</td>
<td>4.325</td>
<td>Non-equivalent, inconclusive</td>
</tr>
</tbody>
</table>

*Figure 10.* SGPlots of disclosure of sensitive information for linguistic analysis
margin for clinical tolerance and the CI upper bound below the upper margin for clinical
tolerance (96% CI = −8.419 <= II_1 – II_2 <= 4.325). Thus, for all pairwise comparisons,
results were inconclusive for telephone focus group venue and face-to-face focus group
venue, Internet video-based focus group venue and face-to-face focus group venue, and
telephone focus group venue and Internet video-based focus group venue.

**Research Question 5**

Research Question 5 (RQ5) asked, *Is adherence to the topic for the test treatments
equivalent or non-inferior to the comparator?* RQ5 had three subcomponents comparing
telephone to face-to-face focus group venues, Internet to face-to-face focus group venues,
and Internet to telephone focus group venues. Only content analysis was used to analyze
this variable. Specifically the questions were:

Is **adherence to the topic** in the telephone focus group venue equivalent or non-
inferior to the face-to-face focus group venue? Is **adherence to the topic** in
synchronous Internet video-based focus group venue equivalent or non-inferior to
the face-to-face focus group venue? Is **adherence to the topic** in synchronous
Internet video-based focus group venue equivalent or non-inferior to the telephone
focus group venue?

**ADHR**

Another concern of conducting focus groups is keeping participants on topic. This
question was measured by content analysis only. This variable measured the total number
of on-topic lines divided by the total number of lines a participant spoke to achieve an ADHR percentage.

As seen in Table 15, results from the t test using TOST indicated equivalence of telephone and face-to-face focus group venues (96% CI = -4.210 ≤ II1 - II2 ≤ 3.287) with both the CI upper and lower bounds within the upper and lower margins. As seen in Figure 11, Results were inconclusive for comparisons of Internet video-based and face-to-face focus group venues with the CI lower bound below the lower margin for clinical tolerance and the CI upper bound below the upper margin for clinical tolerance (96% CI = -6.265 ≤ II2 - II3 ≤ 2.868) and Internet video-based and telephone focus group venues with the CI lower bound below the lower margin for clinical tolerance and the CI upper bound below the upper margin for clinical tolerance (96% CI = -5.864 ≤ II2 - II3 ≤ 3.390). A stricter test for non-inferiority was conducted on the first finding. Equivalence held for telephone compared to face-to-face focus group venues (98.33% CI = -4.824 ≤ II1 - II2 ≤ 3.901), again with both the CI upper and lower bounds within the upper and lower margins. Thus, for all pairwise comparisons, results were inconclusive for Internet video-based compared to face-to-face and telephone focus group venues, but the telephone was found equivalent to the face-to-face focus group venue even at the stricter level.
Table 15

Adherence to the Topic as Shown by Content Analysis

<table>
<thead>
<tr>
<th>Comparison Group</th>
<th>Mean</th>
<th>CI LB</th>
<th>CI UB</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face vs. Telephone</td>
<td>–0.461</td>
<td>–4.210</td>
<td>3.287</td>
<td>Equivalent, non-inferior</td>
</tr>
<tr>
<td>Face vs. Internet</td>
<td>–1.699</td>
<td>–6.265</td>
<td>2.868</td>
<td>Non-equivalent, inconclusive</td>
</tr>
<tr>
<td>Telephone vs. Internet</td>
<td>–1.237</td>
<td>–5.386</td>
<td>3.390</td>
<td>Non-equivalent, inconclusive</td>
</tr>
</tbody>
</table>

Figure 11. SGPlots of adherence to the topic by content analysis
CHAPTER V

DISCUSSION, LIMITATIONS, AND RECOMMENDATIONS

Chapter V opens with a summary of the findings, reviewing the results of each research question presented in Chapter IV. The second section provides a discussion of the findings from the perspective of the venue and in the light of qualitative study. The next section addresses the limitations of the study. The final section presents the practical implications and recommendations for future research.

Discussion of the Research Findings

The purpose of this study was to conduct a side-by-side comparison of the focus group venues: face-to-face, telephone, and Internet video-based. As confirmed in Chapter I, researchers choose focus groups as a research data collection tool more often and continue to widen the boundaries of focus group venue, expanding beyond conventional spatial and temporal boundaries (Iacobucci, 2001). Further, the use of focus groups has escalated exponentially in educational and other social science arenas (Scott & Morrison, 2006; Singh, 2008). It is imperative to understand the implications of those decisions. This study was designed to fill a gap and contribute to the knowledge base regarding the effects of implementing an assortment of focus group venues on the defining characteristics attributed to their selection as a data collection tool. Results of this study revealed that some characteristics of the three venues do not behave equally. The
following section summarizes findings for each of the research questions in the context of their implications, limitations, and future use.

Research questions were analyzed using methods from two fields. Content analysis is a popular tool used in qualitative research to identify themes found in the data. The linguistic analysis tool used for this dissertation is popular in psychological, discourse, and communication fields. While no direct comparison between content and linguistic analysis was conducted, using multiple methods to analyze the data afforded a higher degree of confidence to the research findings.

**Qualitative Perspective**

In qualitative research, the use of multiple methods enhances the idea of trustworthiness. Much like a quantitative researcher’s objective to show validity, reliability, generalizability, and significance, qualitative researchers seek the four arms of a trustworthy study: credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). As focus groups are situated and employed under both, a discussion of both is of importance. The following discussion explores the trustworthiness of this study in a qualitative context and provided as backdrop for discussion of research findings.

**Credibility**

Credibility establishes that the research findings are believable from the perspective of the participants and likened to internal validity (Lincoln & Guba, 1985). The extant data were de-identified; thus, the researcher was unable to provide credibility at the participant level. However, the moderators probed participants to ensure a full
understanding of participant meaning asking: What do you mean, you like how it is? Give me an example of a time when you had to do that. Tell me a little more about that. How are you going to be different? Well can you give me an example of how you’re more assertive? Answers to these questions aided the researcher’s ability to more fully understand participant meaning.

Credibility at the dissertation level was provided through methods recognized in literature: the adoption of well established research methods, triangulation of data analysis, peer scrutiny of the research project, credibility of the researcher, and examination of previous research findings (Shenton, 2004). In addition, research methods identified operational measures that match the construct, as identified throughout the dissertation and in the discussion of research finding in this chapter (Yin, 2009).

**Transferability**

Transferability is the idea that qualitative results are transferable to other settings much like generalizability (Lincoln & Guba, 1985). The idea of qualitative external validity is the extent to which the findings of this study can be applied to other situations (Gall et al., 2003). The Latin square design allowed a high degree of transferability with the use of multi-site, multi-state data. Often focus group designs are not extended across or within state lines; thus, the scope of this study aids in transferability.

**Dependability**

Dependability demonstrates that if a researcher would obtain the same results twice by accounting for changing conditions. Early qualitative researchers suggested
several options to enhance dependability (Denzin, 1994). One of these is through stepwise replications also referred to as time triangulation. This study collected replicated data over the course of two school years, thus lending it to provide consistency over time. Applied to the dissertation study, one manner of assessing dependability is full disclosure of research design and implementation by “describing what was planning and executed at a strategic level” (Shenton, 2004, p. 71). To address this, the researcher provided comprehensive detail of the design and steps to implement of this research project.

**Confirmability**

Confirmability measures how well the inquiry findings are supported by the data collected (Lincoln & Guba, 1985). In other words, a reader of this dissertation should be able to confirm the results and interpretations. For this study, original data were not included for confidentiality reasons; however, definitions from the LIWC dictionary were included in the text, and the focus group protocol, database search criteria, and SAS programs are included in Appendix D to assist in this effort.

**Summary of Research Question 1**

Research Question 1 (RQ1) asked, *Are participant interactions for the test treatments equivalent or non-inferior to the comparator?* A critical reason for selecting focus groups as a data collection tool is participant interaction (Gill et al., 2008; Grønkjaer et al., 2011; Hemsley et al., 2008; Ho, 2006; Morgan, 1997). RQ1 was analyzed using the two methods from two fields, thus addressing both the more rigorous
quantitative linguistic analysis and qualitative content analysis. Additionally, the multiple methods address data analysis triangulation (Kimchi et al., 1991).

Although the results of the two methods for analyzing RQ1 did not provide identical conclusions, the patterns revealed in the plots mirror each other (see Figures 5 and 6). The confidence intervals for PI_C showed a greater range between upper and lower bounds than PI_L, but both concluded non-equivalence for comparisons of telephone and Internet video-based focus group venues with face-to-face focus group venues and the lower bounds were below the lower margin of clinical tolerance. For both PI_C and PI_L, the Internet video-based focus group venue was found non-inferior to the telephone focus group venue with the lower bound above the lower margin of clinical tolerance. With the dual findings of PI_C and PI_L, a researcher can feel confident that participant interactions in the Internet video-based focus group setting would closely mirror that of the telephone focus group venue.

These results were not confirmed for the comparisons of Internet video-based and telephone focus group venues with face-to-face. Both PI_C and PI_L indicated non-equivalence of either venue with face-to-face with content analysis suggesting inferiority of participant interactions in the telephone focus group venue as compared to face-to-face. Researcher prudence is recommended. Content analysis used a procedure of line-by-line analysis, back and forth counts for participant interaction. Thus, if a researcher’s main interest in conducting focus groups is to elicit lively conversational data through group interactions, this may be impeded in the telephone focus group venues. If participant interactions are a key design priority, the safest choice to would be to implement focus groups in a face-to-face venue.
Summary of Research Question 2

Research Question 2 (RQ2) asked, *Is breadth of conversation for the test treatments equivalent or non-inferior to the comparator?* Breadth of conversation is the coverage or scope of information across key areas of interest (Ritchie & Lewis, 2003). BRD may be the area of focus when the goal is more exploratory in nature or a researcher is hoping to gain awareness of a variety of information across several topics in a short amount of time. BRD may be of particular interest when a researcher wants to gain multiple perspectives and vantage points in relation to the area of inquiry and may often use the focus group to narrow down topics of interest (Gregory & Russell, 2003). Results revealed that BRD for the Internet video-based focus group venue, although not equivalent, was non-inferior to face-to-face focus group venue. In contrast, telephone focus group venue was found non-equivalent but inconclusive to face-to-face, and Internet video-based focus group venue was found non-equivalent but inconclusive to telephone focus group venue. Consequently, based on these results, a researcher could support exchanging the Internet video-based and face-to-face focus group venues when breadth of conversation is the main objective of the study. These results, however, do not support the use of Internet video-based focus groups when the research design demands a wide range of information. The variability of data collected in telephone focus groups appears to range from truncated conversations to conversations which lend great amounts of information containing little detail. Further study with larger samples sizes are needed to determine the nature of non-equivalence for comparisons of telephone to face-to-face focus group venues and Internet video-based to telephone focus group venues.
Summary of Research Question 3

Research Question 3 (RQ3) questioned whether depth of conversation for the test treatments was equivalent or non-inferior to the comparator. Depth refers to the intimacy level of the conversation (Derlega et al., 2008). DPTH may be a variable of interest if a researcher is interested in collecting information on participant values, beliefs, principles, or other information that may not surface in typical conversation. All three comparison groups kept within a tight range of confidence intervals for DPTH. Non-equivalence and non-inferiority were shown for comparisons of telephone and Internet video-based focus groups venues to face-to-face focus group venue. However, Internet video-based focus group venue was non-equivalent and inconclusive to telephone focus group venue. Thus, caution should be used when deciding to use Internet video-based over telephone focus group venues. However, a researcher can feel confident to exchange telephone or Internet video-based focus groups with face-to-face focus group venue when the primary consideration is to gain a depth or density of information.

Summary of Research Question 4

Research Question 4 (RQ4) asked, *Is disclosure of sensitive information for the test treatments equivalent or non-inferior to the comparator?* Focus groups are depicted to have the ability to facilitate the collection of data about sensitive topics (Wutich et al., 2010). Many studies confirm that participants may be more comfortable sharing their experiences in a group than in one-to-one interviews (Webb & Kevern, 2001). Further,
the literature suggests a positive correlation between increased anonymity levels of the venue and the rate of disclosure of sensitive information (Qian & Scott, 2007).

RQ4 was analyzed using the two methods from two fields, thus utilizing the more rigorous quantitative linguistic analysis and qualitative content analysis. Additionally, the multiple methods address data analysis triangulation (Kimchi et al., 1991). Both linguistic and content analysis reached conclusions of non-equivalence by inconclusive measures for comparisons of Internet video based focus group venue to face-to-face focus group venue and Internet video-based focus group venue and telephone focus group venue. However, while linguistic analysis found non-equivalence by inconclusive results for the comparison of telephone and face-to-face focus group venue, content analysis showed not only non-inferiority but suggested superiority of using the telephone focus group venue over face-to-face. The measure for DSC_C was tightly aligned with intended outcomes for the focus groups, measuring disclosure of information specifically related to disabilities. The DSC_L was not programmed to target its analysis in this manner and measured the variable of interest with generalized linguistic markers known to indicate the construct. Thus, operationalization of DSC_C measured only the disclosure of sensitive information of interest to the research agenda. The results from this analysis hint that there may be value in conducting an additional analysis to test for superiority of telephone focus group venue to see if they are indeed superior for collecting information of a sensitive nature. If this proved true, a researcher interested in studying extremely sensitive topics may choose to use this venue. While the data from this study analyzed a sensitive topic of a personal nature, a research may benefit from greater anonymity when topics are politically, socially, or personally sensitive. The results here provide evidence
that may substantiate that using a telephone focus group venue may indeed increase disclosure rates. However, with both linguistic and content analysis giving an inconclusive report, a researcher should use caution when implementing Internet video-based for sensitive topics.

Summary of Research Question 5

Research Question 5 (RQ5) asked, *Is adherence to the topic for the test treatments equivalent or non-inferior to the comparator?* Focus groups may be used to explore broad to narrowly focused topics of interest (Wong, 2008). One of the major benefits to focus groups is the presence of a moderator to focus participants on the topic of research (Krueger & Casey, 2009). Results revealed that participants stayed on-topic to a larger degree when in a face-to-face or telephone focus group setting. In fact, the telephone focus group venue was found to be equivalent to face-to-face focus group venue. These findings were unanticipated as the literature reports that face-to-face focus group venues tend to be interrupted with sidebar conversations. It is possible that sidebar conversations occurred but may not have been picked up by the recording device or transcribers did not transcribe this information. Not expected was that the Internet video-based venue was found to be non-equivalent by inconclusive results when compared to both telephone and face-to-face focus group venues. While it may be anticipated that off-topic conversation occurred due to troubleshooting technical difficulties, this was not the case. Although off-topic conversation was not measured for content, the researcher noted in many cases, students spent time conversing about logistics dealing with social issues such as lunch or rides home. This type of off-topic conversation may be due to the contextual nature of
collecting data from students during the school day and may not carry over into Internet video-based conversations with different participants. Therefore, according to these results, a researcher may decide to use either telephone or face-to-face focus group venue with confidence. However, although this study shows them equivalent, caution is advised due to the amount of literature that describes face-to-face focus group as more difficult in staying on-topic.

**Overall Summary**

In summary, focus groups are reported as a useful data collection tool for research projects aimed at collecting data in a group setting. In particular, the five variables studied in this dissertation play critical roles in making this a valuable tool to researchers: participant interactions, breadth of conversation, depth of conversation, disclosure of sensitive information, and adherence to a topic. As shown, each of these responds differently and independently in each of the focus group venues. The traditional face-to-face focus group venue holds as the preeminent venue in the area of participant interactions. As this is the most reported benefit to conducting focus groups, a researcher needs to determine if a research goal is to elicit data through participant interactions. In this study, telephone focus group venue provided a second choice to face-to-face focus group venue for research projects whose goal is to extract depth of conversation or to keep the participants on-topic. Additionally, if the researcher’s main goal is to gain access to sensitive information, the telephone focus group venue appears the most suited for this task. Finally, the Internet video-based focus group venue may provide a viable option to face-to-face focus group venue when the researcher needs to explore a breadth or depth of
information. However, the Internet video-based focus group venue only proved equivalent or non-inferior to the telephone focus group venue for participant interactions. Based on the results, a researcher needs to consider the research question and design to guide how a focus group is constructed (Onwuegbuzie et al., 2010; Tremblay et al., 2010).

**Implications**

This dissertation studied a gap in research methods addressing the implications of conducting focus groups in a telephone or Internet video-based venue. While this study did not employ experimental control group design, it did implement tests of acceptable rigor for both the quantitative and qualitative fields to provide an ability to determine qualitative implications and provide a degree of statistical inferences related to focus group venue. However, the number of inconclusive results alerts to the need for replicated studies and studies with a greater sample size. On a practical level, this study provides guidance to: (1) inform researchers to make sound choices in future studies, (2) help the reader gain a clear enough understanding of the procedures to reproduce the study, and (3) highlights areas of the greatest concern for future exploration.

**Limitations**

Findings should be interpreted within the context of the following limitations:

1. This dissertation used extant data derived from an evaluation used to measure the effectiveness of a specific educational practice. As such, the researcher had no control over the original design.
2. The transcripts did not provide details as to technical difficulties encountered in a focus group. Therefore, data may have been lost.

3. Multiple moderators were used in the original study, each with their own personality and knowledge of sound moderator practices. As such, the moderator may have biased the data.

4. One moderator used a voice activated audio recorder and in several instances the first few words a participant spoke were cut with no option for recovery.

5. A few of the focus groups had interpreters or aids to assist student participation. There was no systematic measure of how their presence may have affected the conversation of the students.

6. Focus groups provide an assortment of possible variables to study. The variables of this study were analyzed independently and this study did not provide an overall assessment of the equivalence of focus group venue, only an assessment of individual characteristics of focus group venues.

Recommendations

The purpose of this study was to examine the equivalence or non-inferiority of focus group venues. The findings contribute information to the field in regard to researcher selection of focus group venue. Given the limitations of this study, it is recommended that further research implementing a larger sample size of comparisons be conducted. This study examined only five of the focus group measures that could have been examined. Further research should examine a greater variety of focus group venue measures using a more powerful design.
In the comparison of telephone and face-to-face focus group venue, the finding of equivalence in regards to topical adherence was not anticipated. While this study identified the occurrence of topical adherence, it offered no explanation for why it was found. As such, it is recommended to further study this phenomenon. Additionally, an important finding of this study was that telephone focus group venues were identified as non-inferior to face-to-face focus group venues for disclosure of sensitive information with a suggested outcome of telephone as superior to face-to-face for this variable. Further analysis of this data to determine superiority was not planned a priori and post-priori was beyond the scope of this dissertation. It bears further investigation to inform the field if indeed telephone respondents are more likely to disclose sensitive information over the telephone. This study also did not explore any methods to minimize moderator influence on the data and did not identify or conduct analysis to determine the effects associated with aggregating variable data to produce an overall measure. Hence, the following topics are suggestions for further research:

1. Conduct a similar study using a strong design to determine if these findings hold.
2. Conduct a similar study using greater power to decrease the likelihood of further non-equivalent by inconclusive results.
3. Control for moderator effects by first providing comprehensive training to the moderators to ensure fidelity of implementation. Next, training the moderators on a standardized method for determining if there is a need for a participant to include a guest in the focus group for communication purposes and how to
appropriately include that guest in the focus group. Finally, limiting the number of moderators conducting focus groups.

4. While outside the scope of the current study, an exploration of ethics in technology based venues is advised. Greenbaum (2008) suggested the idea of increased security of non-face-to-face venues, to address the issue of an unknown person attending the focus group in an environment where you do not see others and therefore may not know who is listening.

5. Another area to explore is how to address the technical support for issues that may arise during a telephone or Internet based focus group without gaining guests in the focus group. In this study, it proved difficult to remove someone assigned to provide technical support during the focus group, especially in the situation where a student was accessing the focus group through technology owned by a teacher or administrator.

6. There is a need in the social science literature for methods to determine equivalence and non-inferiority margins of clinical tolerance. Researchers are encouraged to ground their decision of these margins from previous research findings. However, there were no previous studies that used equivalence and non-inferiority testing for this topic. Hence, there were no practical measures to determine delta.

7. This study analyzed only the exchangeability of focus group venue and did not analyze the effects of aggregating data from multiple venues in the same study. Therefore, researchers are encouraged to analyze the effects of aggregating data when using multiple venues within the same study.
8. The final recommendation is for researchers to study the effects of multiplicity to provide recommendations to the field. This study implemented a Bonferroni adjustment that may have been too conservative.
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Appendix A

Human Subjects Institutional Review Board Approval Letter
Date: February 9, 2012

To: Brooks Applegate, Principal Investigator
Paula Kohler, Co-Principal Investigator
June Gothberg, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: HSIRB Project Number 12-02-24

This letter will serve as confirmation that your research project titled “The Role of Focus Group Venue: A Comparative Study of Face-to-Face, Telephone, and Internet Video-Based Focus Groups” 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: February 9, 2013
Appendix B

Focus Group Protocol
National Secondary Transition Technical Assistance Center NSTTAC

Student Self-Determination Outcomes

Focus Group Protocol
March-June 2011
Introduction (10 minutes):

Good afternoon. We would like to thank you all for participating in this conversation. I am (_______) from Western Michigan University and I work for the National Secondary Transition Technical Assistance Center or NSTTAC for short. This is my colleague (_________) who will be working with NSTTAC.

You were asked to talk with us because you took (teacher name)’s (name of class) class in (semester/year of class). This class talked about: setting your goals, participating in your IEP, and thinking about how to prepare for your future (any of all of these). NSTTAC worked with your school to start this class and we are interested in how this class is helping you speak for yourself and how you believe it will help you in the future. The information you give us today will teach us what works and what doesn’t work for students. We will use this information to help future students in other schools. We really appreciate you taking the time to help us.

Before we get started, there are a few things you should know.

• We are very interested in everyone’s point of view. It is okay if you have different opinions; we would like to hear all of them. There are no wrong answers.

• It is very important that you do not speak at the same time. We would like to be able to hear each of you. So, please take turns and avoid side conversations.

• We will remain objective. So, we ask that you please say what you think, not what you think we want to hear.

• The conversation will be audio recorded. This will allow us to go back and listen, take notes, and then write a short summary about what was said. We want to reassure you that we will not share this audio recording. All of your comments will remain anonymous. This means your names will stay secret and won’t link you to what you said.

Do you have any questions before we begin?

Participant Introductions:

We may have met some of you in last year, but not all of you. So, let’s start off by going around the table with introductions.

Please tell us:
• Your first and last name
• Your grade
• Whether or not you remember taking this class (more prompts may be needed—could come from other students in the group)
Section 1: Student Learning (15-20 minutes)

**Evaluation questions addressed in this section:** Now that students have participated in a semester long (or more) class, did they learn what they were supposed to learn (self-directed IEPs, self-determination, self-advocacy skills, about their disability, about help, supports, and accommodations)? If yes, do they use the skills they learned?

**Question 1:** Please give us an example of something you learned in this class.
*(You may need to prompt again with the teacher and class information)*

**Question 2:** Did you learn about disabilities in your class?
Did you learn about your disability?
*(Confirm these with the students first and then ask the question below)*

Please give us an example of a time you have told someone about your disability.

**Question 3:** Accommodations are: changes, adaptations, modifications to help you in school. Did you learn about accommodations in your class?
Did you identify your accommodation needs?
*(Confirm this with the students first and then ask the question below)*

Please tell us about a time you have asked someone for accommodations.
Section 2: Student Participation in the IEP (30-40 minutes)

Evaluation questions addressed in this section: Did the class prepare the students to participate in the IEP? What do students need to learn to participate in their IEP? Are students able to identify what they need to reach their goals? This section will help identify what the students learned, how they used what they learned, and how they were able to apply this to the IEP process.

Question 1: Did you learn about IEPs in your class?  
(Confirm this with the students first and then ask the question below)

What did you learn about your IEP?

Question 2: Did you learn about making decisions about what you want to do after high school?  
(Confirm this with the students first and then ask the question below)

Do you think the class helped you to make decisions about what you want to do after high school?

Question 3: Before taking this class what did you think an IEP was?

How did you feel about your IEP meeting before taking this class?
Before taking this class, how did you participate in the IEP?
(Prompts: planning the IEP, inviting people to the IEP, presenting information about yourself, setting school goals, setting goals for after high school)

**Question 4:** How do you feel now about your IEP?

How do you participate now in the IEP?
(Prompts: planning the IEP, inviting people to the IEP, presenting information about yourself, setting school goals, setting goals for after high school)
Section 3 Resiliency: Student Behavior and Attitude Changes (30-40 minutes)

Evaluation questions addressed in this section: Do students notice a change in their own attitude or behavior (in school, outside school, with their family, with their friends, with their self)?

Question 1: What differences do you think having this class has made in how you feel about yourself?

Question 2: What differences do you think having this class has made in how you feel about your future?

Question 3: What changes have you noticed about how you handle challenges at school, at work, at home, with your friends?
Section 4: The Last Word

Question 1: Are there other things you think are important to tell us that we didn’t ask?

Question 2: Would you recommend this class to a friend? Why or why not?

Conclusion: Thank you all for participating in this conversation. I appreciate your openness and look forward to seeing you in the future. If you have any questions or concerns please don’t hesitate to call or email me: __________, xxx-xxx-xxxx (office), 269-xxx-xxxx (cell).
Appendix C

Universal Design for Evaluation Checklist
The purpose of this checklist is to provide support for program evaluators who design, develop, implement, and disseminate evaluations. This checklist is designed to assist the evaluator to include all individuals in the evaluation process; people of all ages and all abilities. To do this, evaluators are encouraged to use the seven principles of Universal Design. “Universal design asks from the outset how to make the design work beautifully and seamlessly for as many people as possible. It seeks to consider the breadth of human diversity across the lifespan to create design solutions that work for all users”. This checklist is best implemented during the planning phase of the evaluation project in order to ensure full participation for all populations.

**Principle One: Equitable Use** *The design is useful and marketable to people with diverse abilities.*

- Evaluation plan represents people of all ages, gender, ethnicity, culture and ability as staff, advisors, and/or co-researchers.
- Evaluation plan prepares for locating diverse study participants and providing accessible recruitment materials.
- Informed consent materials are simple and accessible with alternate forms available.
- Informed consent materials allow participants to understand the plan for data use and dissemination.
- Evaluation plan is transparent with all steps understood; including proper procedures for publishing for community, cultural, and tribal participants.
- Evaluation plan is grounded in context with consideration for community and cultural appropriateness of methods used for gathering information.
- Evaluation plan follows all IRB processes including community, cultural, and tribal protocols.

**Principle Two: Flexibility in Use** *The design accommodates a wide range of individual preferences and abilities.*

- Evaluation plan shows evidence of preparation to:
  - Communicate with participants of diverse abilities, communication styles, and cultural backgrounds.
  - Quickly solve problems in regards to individual needs.
  - Include a variety of data collection tools to accommodate communication preferences or needs.
  - Include extra time for participants with slower cognition or language barriers.
  - Include extra time to observe cultural practices.
**Principle Three: Simple and Intuitive** *Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. Eliminate unnecessary complexity.*

**Data collection instruments and materials:**
- Provide for different communication preferences or needs.  
- Are available to people with a variety of reading levels and backgrounds.  
- Use simple language, concrete questions, and show cultural competency.  
- Meet low vision and color blind requirements.  
- Are free from acronyms, jargon, slang, and colloquial terms.

**Principle Four: Perceptible Information** *The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.  

- Sensory issues are addressed.  
- Multiple media options are used to present information.  
- All printed publications are available immediately or in a timely manner in alternate formats.  
- A statement is included in all materials about procedures for requesting accommodations or assistance.  
- Online materials adhere to web accessibility standards (see: www.w3.org/WAI/).  

**Principle Five: Tolerance for Error** *The design minimizes hazards and the adverse consequences of accidental or unintended actions.*

**Instruments and protocols:**
- Are pilot tested with participants who resemble your target audience.  
- Are easy to understand and responses intuitive, even if people don’t read the instructions.  
- Avoid “skipping” (e.g. “if you answer no please skip to number 17”).  
- Avoid lengthy instructions keeping them to 12 words or less.  
- Avoid confusing instructions.  
- Allow different response options for different reading and/or cognitive levels.  
- Allow verbal or written responses outside the standard instrument.  
- Include optional probes or explanations to make questions accessible to a wider audience.  
- Online options provide a long time out period for those with dexterity and processing challenges.  
- Online options are available to save and return later.
**Principle Six: Low Physical Effort** The design can be used efficiently and comfortably, and with a minimum of fatigue.

**Location and meetings:**
- Are accessible on a bus line, in a central location, close to building with parking, ramps, and elevators allowing access to wheelchairs.
- Are held at times and locations of the participants’ choosing.
- Provide comfortable seating options
- Allow for break time, shortened time, or multiple sessions.
- Include options for collecting data, communicating, and/or sharing information online.

**Principle Seven: Size and Space for Approach and Use** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user’s body size, posture, or mobility.

**Site:**
- Ensures accessibility for interviews, focus groups, meetings, presentations, or other project-related gatherings
- Has accessible restrooms, the room is quiet, the space is well-lit, and provides enough space for sign language interpreters, readers, or personal assistants.
- Allows transportation accessibility, with event timed around transportation availability.
- Allows for on-site accommodation (e.g., adding a reader or interpreter)

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This checklist is being provided as a free service to the user. The provider of the checklist has not modified or adapted the checklist to fit the specific needs of the user and the user is executing his or her own discretion and judgment in using the checklist. The provider of the checklist makes no representations or warranties that this checklist is fit for the particular purpose contemplated by user and specifically disclaims any such warranties or representations.

2. other languages, in Braille, at lower reading levels, large print, verbal, pictorial, electronic, and audio format
3. second language interpreters, sign language interpreters, readers, large text, and Braille.
4. interviews, focus groups, observations
5. choice of in-person, telephone, and online venues; written, drawn, or oral responses, and use of smart tools (smart phones, iPad, tablets)
6. having multiple versions for different respondent types, or having optional explanations or probe questions
7. types of scales, number of units, probes or explanations, keeping questionnaires short and simple, questions with cultural competency
8. provided in simple high contrast black on white or white on black, 12 point font or greater, with font chosen being evenly spaced, having high crossbars and consistent width, distinct under slinging, and avoids the use of cursive, italics, and colored text and backgrounds
9. lower lighting, no flickering florescent lights, minimal noise, seating away from doors and windows, quiet ‘fidget’ toys -think stress ball
10. Likert-like responses increase from left to right in an intuitive manner and are consistent throughout the survey
11. three-point Likert-like scale instead of five- or seven-point scale, pictorial responses such as smiles or frowns for younger or non-readers
12. bus or cab fare, buses that provide transportation from homes may only run at prearranged times during the day, personal drivers
Appendix D

SAS Code
Creating the Latin square design
*--------------------------------------------------------------------------*
OPTIONS LS=80 PS=66 NODATE;
TITLE 'A 3 BY 3 LATIN SQUARE DESIGN for Student Focus groups';
OPTIONS LS=80 PS=66 NODATE;
TITLE 'A 3 BY 3 LATIN SQUARE DESIGN';
PROC PLAN SEED=12345;
FACTORS ROWS=3 ORDERED COLS=3 ORDERED /NOPRINT;
TREATMENTS TMTS=3 CYCLIC;
OUTPUT OUT=LAT33
ROWS NVALS=(1 2 3)
COLS NVALS=(1 2 3)
TMTS NVALS=(1 2 3);
RUN;
QUIT;
PROC TABULATE;
CLASS ROWS COLS;
VAR TMTS;
TABLE ROWS, COLS*TMTS;
RUN;
QUIT;
*--------------------------------------------------------------------------*
Participant Interactions Content Analysis
*--------------------------------------------------------------------------*
PROC TTEST DATA=Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR Hcgpint;
Title 'Participant Interactions Content Analysis';;
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR Hcgpint;

Title2 'Face-to-Face vs. Internet';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR Hcgpint;

Title2 'Telephone vs. Internet';
run;
******************************************************************************
Participant Interactions Linguistic Analysis
******************************************************************************;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR interC;
Title 'Participant Interactions Linguistic Analysis';
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR interC;

Title2 'Face-to-Face vs. Internet';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR interC;
Title2 'Telephone vs. Internet';
run;
*******************************************************************************
Breadth of Conversation Content Analysis
*******************************************************************************;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR Hcbreadc;
Title 'Breadth of Conversation Content Analysis';
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR Hcbreadc;
Title2 'Face-to-Face vs. Internet';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR Hcbreadc;
Title2 'Telephone vs. Internet';
run;
*******************************************************************************
Depth of Conversation Linguistic Analysis
*******************************************************************************;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR depthc;
Title 'Depth of Conversation Linguistic Analysis';
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR depthc;

Title2 'Face-to-Face vs. Internet';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;

WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR depthc;

Title2 'Telephone vs. Internet';
run;
******************************************************************************
Disclosure of Sensitive Information Content Analysis
******************************************************************************

PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;

WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR Hdisclc;
Title 'Disclosure of Sensitive Information Content Analysis';
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;

WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR Hdisclc;

Title2 'Face-to-Face vs. Internet';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;

WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR Hdisclc;

Title2 'Telephone vs. Internet';
run;
Disclosure of Sensitive Information Linguistic Analysis

PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR disclosC;
Title 'Disclosure of Sensitive Information Linguistic Analysis';
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR disclosC;
Title2 'Face-to-Face vs. Internet';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR disclosC;
Title2 'Telephone vs. Internet';
run;

Adherence to the Topic Content Analysis

PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '1ttrt');
CLASS lvl;
VAR HadherC;
Title 'Adherence to the Topic Content Analysis';
Title2 'Face-to-Face vs. Telephone';
run;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('Control', '2ttrt');
CLASS lvl;
VAR HadherC;
PROC TTEST DATA =Fg_diss.vnue dist=normal tost(-5, 5) ALPHA=0.0167;
WHERE lvl IN ('1ttrt', '2ttrt');
CLASS lvl;
VAR HadherC;

Title2 'Telephone vs. Internet';
run;

Title2 'Face-to-Face vs. Internet';
run;

Correlation of variables of interest at group level
************Correlation of Dependent Variables
Title 'Correlation of Dependent Variables';
Title2 'Across all focus group levels';
run;

/*Define the PDF output filename.*/
ods listing close;
ods pdf file="G:\June's Files\LSD\SAS_output\LSD_bygrp_byrep_output.pdf";
ods graphics on;
proc glm data=Fg_diss.vnue2;
   class lsd state group venue;
   model Hcbreadc = lsd state group venue;
      title1 "Breadth of Information Given by Replicate @ Group Level Content Analysis";
      title2 "Number of words / number of ideas";
run;
proc glm data=Fg_diss.vnue2;
   class lsd state group venue;
   model depthc = lsd state group venue;
      title1 "Depth of Information Given by Replicate @ Group Level Linguistic Analysis";
      title2 "prepositions + conjections + exclusionary + cognitive mechanical words";
run;
/*Participant interactions*/
proc glm data=Fg_diss.vnue2;
  class lsd state group venue;
  model Hcgpint = lsd state group venue;
  title1 "Interactions between Participants by Replicate @ Group Level Content Analysis";
  title2 "Total number of times participants spoke - number of times moderator spoke";
run;
proc glm data=Fg_diss.vnue2;
  class lsd state group venue;
  model interc = lsd state group venue;
  title1 "Interactions between Participants by Replicate @ Group Level Linguistic Analysis";
  title2 "personal pronouns used + assents + positive emotions+ questions asked";
run;
/*Adherence to the topic*/
proc glm data=Fg_diss.vnue2;
  class lsd state group venue;
  model Hadherc = lsd state group venue;
  title1 "Adherence to the Topic by Replicate @ Group Level Content Analysis";
  title2 "total number of on-topic lines / total lines";
run;
/*Disclosure of sensitive information*/
proc glm data=Fg_diss.vnue2;
  class lsd state group venue;
  model Hdisclc = lsd state group venue;
  title1 "Disclosure of Sensitive Information by Replicate @ Group Level Content Analysis";
  title2 "Count of participant responses to sensitive questions (n=6)";
run;
proc glm data=Fg_diss.vnue2;
  class lsd state group venue;
  model disclosc = lsd state group venue;
  title1 "Disclosure of Sensitive Information by Replicate @ Group Level Linguistic Analysis";
title2 "functional + social +affective +cognitive + perception + biological + relative + personal interest words";
run;
/* Close the PDF destination */
ods pdf close;
ods graphics off;
*******************************************************************************************************
SG Plots created from individual M, CI LB, and CI UB files
*******************************************************************************************************;

proc sort data=Fg_diss.hinter;
by descending var;
run;
Title 'Participant Interactions Content Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.hinter UNIFORM=GROUP noautolegend;
   REFLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
   REFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue)LABEL = '-5';
   band y=var lower=-5 upper=5 /transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
      markerattrs= (symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
   xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
proc sort data=Fg_diss.inter;
by descending var;
run;
Title 'Participant Interactions Linguistic Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.inter UNIFORM=GROUP noautolegend;
   REFLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
   REFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue)LABEL = '-5';
   band y=var lower=-5 upper=5 /transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
      markerattrs= (symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
   xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
proc sort data=Fg_diss.hbread;
by descending var;
run;
Title 'Breadth of Conversation Content Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.hbread UNIFORM=GROUP noautolegend;
   REFLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
   REFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue)LABEL = '-5';
   band y=var lower=-5 upper=5 /transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
      markerattrs= (symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
   xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
REFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '-5';
   band y=var lower=-5 upper=5 / transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
   markerattrs=(symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
proc sort data=Fg_diss.depth;
by descending var;
run;
Title 'Depth of Conversation Linguistic Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.depth UNIFORM=GROUP noautolegend;
   RREFLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
   RREFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '-5';
   band y=var lower=-5 upper=5 / transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
   markerattrs=(symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
proc sort data=Fg_diss.hdisc;
by descending var;
run;
Title 'Disclosure of Sensitive Information Content Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.hdisc UNIFORM=GROUP noautolegend;
   RREFLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
   RREFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '-5';
   band y=var lower=-5 upper=5 / transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
   markerattrs=(symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
proc sort data=Fg_diss.disc;
by descending var;
run;
Title 'Disclosure of Sensitive Information Linguistic Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.disc UNIFORM=GROUP noautolegend;
   RREFLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
   RREFLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '-5';
   band y=var lower=-5 upper=5 / transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
   markerattrs=(symbol=circlefilled size=12) transparency=0;
   yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
markerattrs= (symbol=circlefilled size=12) transparency=0;
    yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
    xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;

proc sort data=Fg_diss.hadher;
by descending var;
run;
Title 'Adherence to the Content Analysis';
Title2 'Equivalence and Non-Inferiority Plot';
proc sgplot data=Fg_diss.hadher UNIFORM=GROUP noautolegend;
    RERLINE 5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '5';
    RERLINE -5 / AXIS = X lineattrs=(thickness=2 color=blue) LABEL = '-5';
    band y=var lower=-5 upper=5 /transparency=.8 fillattrs=graphdata1;
scatter y=var x=m / xerrorlower=lowerci xerrorupper=upperci
    markerattrs= (symbol=circlefilled size=12) transparency=0;
    yaxis display = (nolabel noticks) grid values=(-30 to 30 by 10) ;
    xaxis label="Mean and Confidence Intervals" grid values=(-30 to 30 by 10);
run;
Appendix E

Search Terms
PsychInfo Focus Group Search Options

FOCUS GROUP
“focus group*”

TELEPHONE
all(telephone) AND all("focus group*”) OR all(cell) AND all("focus group*”) OR all(cellular) AND all("Focus group*”) OR all(phone) AND all("Focus group*”) OR all(text) AND all("focus group*”) OR all("conference call") AND all("focus group*”) OR all(telephone) AND all("focus group*”) OR all(cell) AND all("focus group*”) OR all(cellular) AND all("Focus group*”) OR all(phone) AND all("Focus group*”) OR all(text) AND all("focus group*”) OR all("conference call") AND all("focus group*”) OR all(telephone) AND all("focus group*”) OR all(cell) AND all("focus group*”) OR all(cellular) AND all("Focus group*”) OR all(phone) AND all("Focus group*”) OR all(text) AND all("focus group*”) OR all("conference call") AND all("focus group*”)

INTERNET
all(Internet) AND all("focus group*”) OR all(Online) AND all("focus group*”) OR all(Web) AND all("focus group*”) OR all(email) AND all("focus group*”) OR all(blog) AND all("focus group*”) OR all("second life") AND all("focus group*”) OR all(avatar) AND all("focus group*”) OR all(asynchronous) AND all("focus group*”) OR all(virtual) AND all("focus group*”) OR all(video) AND all("focus group*”) OR all(ipod) AND all("focus group*”) OR all(ipad) AND all("Focus group*”) OR all(tablet) AND all("Focus group*”) OR all(asynchronous) AND all("focus group*”) OR all(Skype) AND all("Focus group*”) OR all(youtube) AND all("Focus group*”) OR all(ustream) AND all("Focus group*”) OR all(itracks) AND all("Focus group*”) OR all(focus) AND all("focus group*”) OR all(Facebook) AND all("Focus group*”) OR all(Mikogo) AND all("Focus group*”) OR all("Video conference*”) AND all("Focus group*”)

COMBINATION
all(telephone) AND all("face-to-face") AND all("focus group*”) OR all(cell) AND all("face-to-face") AND all("focus group*”) OR all(cellular) AND all("face-to-face") AND all("focus group*”) OR all(text) AND all("face-to-face") AND all("focus group*”) OR all("conference call") AND all("face-to-face") AND all("focus group*”) OR all(Internet) AND all(telephone) AND all("focus group*”) OR all(Online) AND all(telephone) AND all("focus group*”) OR all(Web) AND all(telephone) AND all("focus group*”) OR all(email) AND all(telephone) AND all("focus group*”) OR all(blog) AND all(telephone) AND all("focus group*”) OR all(cell) AND all(telephone) AND all("focus group*”) OR all(cellular) AND all(telephone) AND all("focus group*”) OR all(text) AND all(telephone) AND all("focus group*”) OR all("conference call") AND all(telephone) AND all("focus group*”) OR all(Internet) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all("focus group*”) OR all(cellular) AND all("focus group*”) OR all(text) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all("focus group*”) OR all(Internet) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Online) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(cellular) AND all(email) AND all(cell) AND all("focus group*”) OR all(text) AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all("conference call") AND all(cell) AND all(email) AND all(cell) AND all("focus group*”) OR all(Internet) AND all(cell) AND all(email) AND all(cell) AND all("focus group*")
all(blog) and all(cellular) AND all("focus group") OR all("second life") and all(cellular) AND all("focus group") OR all(avatar) and all(cellular) AND all("focus group") OR all(asynchronous) and all(cellular) AND all("focus group") OR all(virtual) and all(cellular) AND all("focus group") OR all(video) and all(cellular) AND all("focus group") OR all(ipod) and all(cellular) AND all("focus group") OR all(ipad) and all(cellular) AND all("focus group") OR all(tablet) and all(cellular) AND all("focus group") OR all(Internet) and all(phone) AND all("focus group") OR all(online) and all(phone) AND all("focus group") OR all(avatar) and all(phone) AND all("focus group") OR all(asynchronous) and all(phone) AND all("focus group") OR all(virtual) and all(phone) AND all("focus group") OR all(video) and all(phone) AND all("focus group") OR all(ipod) and all(phone) AND all("focus group") OR all(ipad) and all(phone) AND all("focus group") OR all(tablet) and all(phone) AND all("focus group") OR all(Internet) and all(text) AND all("focus group") OR all(online) and all(text) AND all("focus group") OR all(avatar) and all(text) AND all("focus group") OR all(asynchronous) and all(text) AND all("focus group") OR all(virtual) and all(text) AND all("focus group") OR all(video) and all(text) AND all("focus group") OR all(ipod) and all(text) AND all("focus group") OR all(ipad) and all(text) AND all("focus group") OR all(tablet) and all(text) AND all("focus group") OR all(Internet) and all("conference call") AND all("focus group") OR all(online) and all("conference call") AND all("focus group") OR all(Web) and all("conference call") AND all("focus group") OR all(email) and all("conference call") AND all("focus group") OR all(avatar) and all("conference call") AND all("focus group") OR all(asynchronous) and all("conference call") AND all("focus group") OR all(virtual) and all("conference call") AND all("focus group") OR all(video) and all("conference call") AND all("focus group") OR all(ipod) and all("conference call") AND all("focus group") OR all(ipad) and all("conference call") AND all("focus group") OR all(tablet) and all("conference call") AND all("focus group") OR all("face-to-face") AND all("focus group") OR all(online) and all("face-to-face") AND all("focus group") OR all(Web) and all("face-to-face") AND all("focus group") OR all(email) and all("face-to-face") AND all("focus group") OR all(avatar) and all("face-to-face") AND all("focus group") OR all(asynchronous) and all("face-to-face") AND all("focus group") OR all(virtual) and all("face-to-face") AND all("focus group") OR all(video) and all("face-to-face") AND all("focus group") OR all(ipod) and all("face-to-face") AND all("focus group") OR all(ipad) and all("face-to-face") AND all("focus group") OR all(tablet) and all("face-to-face") AND all("focus group") OR all(synchronous) and all("focus group")