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Establishing a Normative Profile on the MMPI-2 for Missionary Candidates

Jonathan Dimos
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ESTABLISHING A NORMATIVE PROFILE ON THE MMPI-2 FOR MISSIONARY CANDIDATES

A Dissertation

Presented to

the Faculty of the Morgridge College of Education

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In Partial Fulfillment

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Doctor of Philosophy

by

Jonathan Dimos

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Advisor: Cynthia McRae, Ph.D.
Abstract

The present study examined MMPI-2 data of 377 missionary candidates who presented for psychological assessment at Missionary Care Services. The purpose of the study was to establish a normative profile for missionary candidates to enhance interpretive validity and reduce missionary attrition. Mean T scores were established for the missionary candidate sample on the F, L, and K validity scales and the ten Clinical Scales. Analyses were conducted to compare the mean T scores of the missionary candidate sample to the mean T scores of the nonclinical normative population of persons taking the MMPI-2 for employment purposes. For both males and females, 10 of the 13 scales analyzed were significantly different from the nonclinical normative population. Results indicated that caution is suggested in interpreting the K scale. Further implications for increasing interpretive validity are discussed. Analyses were conducted to assess trends for MMPI-2 profiles of the missionary candidate sample over time. Results indicated that the mean T score on the K Scale for candidates tested between 1992 and 2002 was significantly higher than the mean T scores for candidates tested between 2003 and 2006 and candidates tested between 2007 and 2010. Analyses were conducted to assess trends by date of birth. Results indicated that the mean T score on the K Scale for Generation Y candidates was significantly lower than the mean T scores for
Baby Boomer and Generation X candidates. Results also indicated that the mean T score on Scale 1 for Baby Boomer candidates was significantly higher than the mean T score for Generation Y candidates. Implications of analyses by date of testing and date of birth for the missionary candidate assessment process are discussed. Future research is needed to further enhance the quality of the missionary candidate assessment process.
Acknowledgements

I am incredibly thankful for all the support I have received in getting across this finish line. A special thanks to Doug Feil, Elizabeth Walter and the whole Missionary Care Services team. You have been at the forefront in the missionary candidate assessment process, and I am grateful that you made such an incredibly rich data source available for me to access. I knew there were many great answers sitting in those file cabinets and the biggest challenge was making sure I asked the right questions. I am looking forward to the challenge of continuing to try to ask the right questions to better serve the population about which we are so passionate.

I have more gratitude than I could ever possibly express for my amazing wife, Juli. There is absolutely no way any of this would be possible without your incredible devotion, support, encouragement, and (of course) your perpetual waterfall of brilliant ideas. There have been bigger highs and lows throughout this process than either of us would have guessed—births and deaths, disappointment and success. But we have sailed through it all rowing together in the same boat, which has made the process more gratifying than the destination. You have my thanks and all my love.

And finally, I would like to dedicate this work to my three kids: Lucia, Mercedes, and Ezra. I suspect you will never read this dissertation, but I hope all the work that went into it finds a way to seep into your hearts and encourages you to stay curious, to see the Beauty in science, to find the right questions, and to believe in big goals. I can’t wait to see how each of your paths turns out.
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Chapter 1
Introduction

Missionaries have traditionally been a difficult population to study (Jensma, Pike, Duerkson, & Strauss, 1997). Missionaries often work in isolated parts of the world and tend to be persons who are drawn to work in environments that require independence (Dillon, 1983). Two large scale surveys have been done by the broader Evangelical missions community in an attempt to gather data on what factors are salient in successful missionary ventures. In 1994, the Reducing Missionary Attrition Project (ReMAP) was launched with surveys covering a broad spectrum of topics sent to over 23,000 current and former long-term missionaries from all over the world (Brierley, 1997). It was the first major survey undertaken in the Evangelical missions community and it provided data on missionary attrition and its causes. While the first ReMAP study focused on the individual missionaries and their personal reasons for leaving or staying on the field, in 2002 the ReMAP II follow-up study focused on organizational issues that affected retention and attrition (Hay, Lim, Blocher, Ketelaar, & Hay, 2007). Over 600 missionary organizations from 22 sending countries were surveyed.

The results of the surveys confirmed previous smaller scale research projects that indicated that attrition is a critical issue in the missions community (Ferguson, 1983; Lindquist, 1982). Missionaries who do not complete their contracts negatively affect missions work in several key areas. The economic costs to missions organizations add up
to millions of dollars each year (Arndt & Lindquist, 1975; Lindquist, 1976, 1983; Taylor, 1997; McKaughan, 1997). The emotional, physical, and relational toll on the missionaries who are unable to complete their commitments can be devastating (Taylor, 1997). In addition, the work that the missionaries originally set out to perform is often incomplete. As a result, mission agencies have sought to understand the causes of preventable attrition and to implement strategies for reducing it.

Of most interest to the present study is the indication that a strong candidate assessment process that includes psychological assessment is a key factor in reducing attrition (Hay, Lim, Blocher, Ketelaar, & Hay, 2007). As psychological assessment has shown success in reducing attrition, mission organizations have sought out cost effective methods to screen candidates. The Minnesota Multiphasic Personality Inventory (MMPI-2) has been shown to be an effective tool in this regard (Schubert, 1999; Schubert & Gantner, 1996).

The chief purpose of the present study is to refine and enhance the psychological assessment process in such a way that will provide more accurate and valid interpretations to missions organizations regarding candidates. While the MMPI-2 is an effective tool for assessment, no attempt to date has been made to create a normative profile for missionary candidates. MMPI-2 profiles of missionary candidates have been compared to the nonclinical normative information provided for the MMPI-2. This approach is problematic in establishing interpretive validity for several reasons. First, missionaries tend to be a unique population who “possess unique characteristics,
stressors, and needs” (Keckler, Moriarty, & Blagen, 2008, p. 205). Several studies of MMPI-2 profiles of missionaries have found mean scale patterns that are significantly different from nonclinical normative samples (Adams & Clopton, 1990; Dillon, 1983; Kyne, 1992; Schubert & Gantner, 1996; Sprinkle, 1989).

A normative profile for missionary candidates will enhance interpretive validity of MMPI profiles by establishing mean scale scores by which to compare individual profiles of missionary candidates. Secondly, missionary work involves a unique and stressful work environment (Miersma, 1993). The purpose of psychological assessment of missionary candidates is not necessarily for diagnosis or treatment. Instead, the purpose of assessment is also to identify issues which may influence healthy adjustment to the rigors of missionary work and cross-cultural experiences (Lindquist, 1997). Psychological profiles that may be interpreted as functional in other nonclinical populations may or may not be functional for missionaries on the field. Conversely, profiles that may be functional for missionaries on the field may or may not be functional for other nonclinical populations (Hall & Sweatman, 2002). Therefore, a normative profile for missionary candidates would facilitate interpretation of employment factors that are uniquely salient for this population.

Finally, establishing a normative profile for missionary candidates will help alleviate fears that some Christians have that MMPI-2 scores will unfairly pathologize them because of their faith-oriented worldview. Duris, Bjorck, and Gorsuch (2007) found elevated Lie scale scores for persons that strongly identified with a Christian subculture.
Based on their religious worldview, Christians appear to interpret questions associated with this scale differently than nonclinical normative samples. Therefore Christians may have elevated Lie (L) scale scores for reasons other than trying to “fake good.” No studies to date have examined similar issues with other scales. However, Christians may feel uncomfortable with some MMPI-2 items, such as questions that pertain to hearing voices. They may perceive a double bind in that the question appears to be a measure of psychopathology, but many Christians report experiencing that they hear God talking to them personally. Dissonance can be aroused when Christians are asked to answer questions truthfully that may present them as pathological when the results are interpreted. Clinicians may therefore misinterpret certain profiles. A normative profile for missionary candidates would address this issue by comparing MMPI-2 scale scores to persons of similar faith, worldview, and religious experiences as opposed to the nonclinical normative sample for the MMPI-2.

No research to date has attempted to define normative data for missionary candidates. Previous research has attempted to establish MMPI-2 normative profiles for medical outpatient populations (Colligan, et al., 2008), Native American populations (Lacey, 2004), personal injury plaintiffs, (Lees-Haley, 1997), college students (Butcher, Graham, Dahlstrom, & Bowman, 1990), and chronic pain populations (Slesinger, Archer, & Duane, 2002). Like these studies, the present study will establish norms by obtaining mean scores on salient MMPI-2 scales and comparing those mean scores to the normative data already established for the MMPI. In this case, means scale scores will be compared
to the MMPI-2 nonclinical normative sample. In addition, this study will establish normative data by comparing mean scale scores for missionary candidates to the MMPI-2 nonclinical normative sample for elevation differences. And finally, this study will look at the mean scale scores for missionary candidates across time. Data will be divided into roughly three equal time periods starting from 1992 until 2010. Each scale will be analyzed for changes across time. This will assist in making more valid profile interpretations and more accurate recommendations to missions organizations by understanding more clearly what trends may be emerging in missionary candidates over these years.

**Purpose of the Study**

This study seeks to establish normative mean T scores for missionary candidates on the Validity and Clinical Scales of the MMPI-2. Attrition is a problem in the missions community in terms of both human and economic costs. An effective pre-screening process that includes psychological assessment is an important factor in reducing attrition rates. There is little empirical research on either MMPI or MMPI-2 scores of missionary candidates, and no research to date has specifically established normative scores for that population. If agencies that offer pre-field psychological screening for missionary candidates have increased access to MMPI-2 data for this population, their interpretations of MMPI-2 data can be more precise and address psychological factors specific to cross-cultural missions work. Further, if missionary organizations have increased access to psychological data that are critical in identifying effective missionaries, their selection
processes may be more successful, they may be able to better equip hired candidates for the stressors endemic to missionary work, and they may reduce rates of preventable attrition. The present study will establish norms regarding psychological profiles of missionary candidates for the purpose of enhancing the candidate selection process and reducing attrition rates.

**Definitions of Terms in the Study**

**Missionary:** “a person sent by a church into an area to carry on evangelism or other activities, as educational or hospital work” functions as a broad definition (dictionary.com, 2009). For the purposes of this study, a missionary will be defined as a person who performs church work in an international cross-cultural setting as a vocation.

**Missionary candidate:** A person who is formally in the application process to serve as a missionary. Married couples are typically both considered missionary candidates, even if one partner will be doing full-time missionary work and the other partner will be more involved in child rearing or non-missions related work. When sending agencies send married couples for psychological assessment to Missionary Care Services, they typically do not specify which spouse will be the candidate. Unless specifically noted by the sending agency or the candidate couple, MCS considers both partners to be “missionary candidates” (D. Fiel, personal communication, September 9, 2009).

**Mission agency, sending agency, mission organization:** These terms will be used interchangeably throughout this dissertation to refer to organizations that are in the business of hiring and sending missionaries.
**Attrition:** “a gradual reduction in work force without firing of personnel, as when workers resign or retire and are not replaced” (dictionary.com, 2009). With missionary populations, there are four categories of attrition (Taylor, 1997). The first kind of attrition is “acceptable attrition” which refers to expected and normal reasons for missionaries leaving the field, such as retirement, health problems, or a change of job for positive reasons. “Preventable attrition” refers to issues among competent missionaries that, if identified, would not necessarily lead to missionaries leaving the field. These issues include lack of home support, poor pre-field training, poor cultural adjustment, or financial concerns. The third category for attrition is “desirable but unrealized attrition.” This refers to missionaries that are not suitable for missionary work, but manage to stay on the field and cause issues for other missionaries and their host cultures. The fourth kind of attrition is “attrition among the vulnerable,” which typically refers to younger missionaries who are considering leaving the field, but could stay and be productive with increased member care from their sending agency. Attrition is considered an inevitable reality of missionary work; however, Taylor (1997) considers it the responsibility of mission organizations to work to reduce preventable attrition and better serve vulnerable missionaries by improving pre-selection assessment, training, and on-field support.

**Psychological assessment:** The process by which missionary organizations ascertain the psychological fitness of their candidates for the stressors of missionary work. The assessment process usually involves a battery of psychological assessment instruments and a clinical interview, after which recommendations are made to the sending agency.
Typically the spouse or significant other of the candidate is also assessed, as their psychological fitness for the cross-cultural missionary lifestyle has a direct impact on attrition (Schubert, 1999). It is becoming more common for the entire family to be assessed as part of the candidate selection process (Hay, Lim, Blocher, Ketelaar, & Hay, 2007).

Evangelical: “Belonging to or designating the Christian churches that emphasize the teachings and authority of the Scriptures, esp. of the New Testament, in opposition to the institutional authority of the church itself, and that stress as paramount the tenet that salvation is achieved by personal conversion to faith in the atonement of Christ” (www.dictionary.com). Because of the emphasis on personal salvation, Evangelicals place a premium on the importance of sending missionaries all over the world.

Research Questions and Hypotheses

This study will address three broad research questions and five hypotheses. Table 1 contains the research questions, hypotheses, MMPI-2 scales to be considered and how the data will be analyzed.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Hypothesis</th>
<th>MMPI-2 Scales to be Measured</th>
<th>Statistical Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are there differences in means across clinical scale scores on the MMPI-2 for missionary candidates?</td>
<td>1. There is no statistically significant difference for MMPI-2 scale scores of missionary candidates across the Clinical Scales.</td>
<td>Clinical Scales</td>
<td>Repeated Measures Factorial ANOVA</td>
</tr>
<tr>
<td>2. Are there differences in mean scores between the sample population and the non-clinical sample of persons taking the MMPI-2 for employment purposes?</td>
<td>2a. There are no differences between MMPI-2 scales of missionary candidates and normative nonclinical samples for the MMPI-2 on test-taking approach.</td>
<td>Validity scales (F, L, and K)</td>
<td>One-sample t-test</td>
</tr>
<tr>
<td>2b. There are no differences between MMPI-2 scales of missionary candidates and normative nonclinical samples for the MMPI-2 on the original Clinical Scales.</td>
<td>Clinical Scales</td>
<td>One-sample t-test</td>
<td></td>
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<td>3. Are there trends on MMPI-2 scores in those who present for candidacy for missionary service across time?</td>
<td>3a. There are no differences across scores divided into three separate groups according by date of testing on MMPI-2 scores for missionary candidates on test taking approach.</td>
<td>Validity Scales (F, L, and K)</td>
<td>One-way ANOVA</td>
</tr>
</tbody>
</table>
Limitations of the Study

While the proposed study does successfully address important gaps in the literature regarding missionary candidates, there are limitations to the study that should be addressed. Although the sample for this study is relatively large, came from geographically diverse locations, currently serve on six continents, and were sent for psychological assessment from over 60 different mission agencies (D. Fiel, personal communication, September 9, 2009), there are also some issues which may affect generalizability to other missionary candidates or missionaries. MCS is an overtly Evangelical organization that serves only Evangelical missions organizations. While Evangelicalism includes a diverse spectrum of Christian denominations and theological persuasions, it is not representative of all Christian organizations that hire and send missionaries, much less all religious organizations that hire and send missionaries.
Therefore, results may be more generalizable to Evangelical missionaries than non-Evangelical missionaries. However, persons who present for missionary work across the religious spectrum may share many broad common characteristics, and therefore, generalization to all missionary candidates should be cautious but not dismissed.

Another consideration is the racial diversity of the proposed sample. While there has been no demographic information on ethnicity collected in candidates’ files, results of an informal survey of the assessors at the site where the data were collected estimated that more than 90% of the present sample of American missionary candidates were European-American, with approximately 1-2% of the applicants being African-American, 1-2% Asian-American, and 1-2% applicants Latino (D. Fiel, personal communication, September 9, 2009). Generalization of the results to ethnic and racial minorities should only be undertaken with great reservation and caution, with specific mindfulness of the implications of bias on specific MMPI-2 interpretations (Sue & Sue, 2007).

A final consideration is that this study does not seek to differentiate between missionary candidates who were ultimately hired or not hired. Neither does the study seek to differentiate between candidates who went on to be hired and were either successful or not in their positions as missionaries. This study is not intended to ascertain predictive norms for missionary candidates as to whether they will be (or should be) hired or whether they will be considered successful in their work. Instead, this study proposes to establish norms based on the available sample for those who present in the hiring process for missionary work. Perhaps further research can build upon the present study
using other samples of missionary candidates to extend the generalizability of the results that are found or seek to ascertain which MMPI-2 scales predict attrition or success when they diverge from the normative sample.
Chapter 2
Review of the Literature

Research related to missionary candidate assessment is a relatively recent phenomenon (Ferguson, 1983). The first known empirical study was published in 1975 (King). This early investigation was a study measuring depressive symptoms of overseas workers in which the sample included some missionaries. The concept, however, of assessment of missionary candidates is a very old one that predates the existence of psychological assessment as a formal discipline.

Overview

This literature review begins by providing an historical overview of the missionary candidate assessment process for the purpose of giving a sense of the challenges involved in missionary selection in the absence of formal psychological assessment. This section is followed by a discussion of the influence of psychological assessment and empirical research on current missionary selection. This section reviews the literature regarding the need for a strong assessment process for the purpose of reducing high attrition rates in the missions community. This section also addresses the use of the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) specifically as an accepted and useful tool for enhancing the missionary candidate assessment process. Next, the literature review will address the history and statistical validity of the MMPI-2.
This section will include a review of how the MMPI-2 has been utilized in the employment assessment field in other high attrition settings. Finally, the small number of empirical studies for MMPI results of missionary populations will be thoroughly reviewed.

**Early Missionary Candidate Selection**

Hiney’s *On the Missionary Trail* (2000) pieces together from diaries and public records the attempts of the London Missionary Society (LMS) to recruit and send missionaries to foreign lands at the end of the 18th century and the beginning of the 19th century. James Cook’s successful voyages and the birth of trans-oceanic travel had made recruiting and sending missionaries to exotic locales possible. What is recorded from the LMS process is an early example of how a strong candidate selection process was considered a vital part of successful missionary work. An LMS interviewing committee decided desirable characteristics of potential missionaries. It was determined that young age and physical hardiness were considered “infinitely preferable to all the learning of the schools; and would possess in the skill and labour of his hands, advantages which barren science could never compensate” (p. 10). This speaks to a pragmatic, ordered, and logical candidate selection process rather than an ideological or faith inspired (“God will bring us the right people”) approach. It appears that this trend continues to the present day.

While many of the candidates who volunteered for this dangerous and almost certainly one-way trip were enthusiastically accepted, the committee was also wary of “more than one charlatan and wild-eyed fanatic” (p. 12). This continues to be an issue that mission
agencies screen for in their candidate selection process, even if their terminology is now more refined.

By 1796, 36 missionaries had been chosen, including 6 married couples. Only four of the missionaries were ordained ministers. All were considered to be in excellent physical condition. Most would never see their native land again and several would die gruesome deaths from exotic disease or violence. Few of their mission posts would last beyond their lifetimes, and some that did would exact devastation on the culture and peoples of the places they went to serve. However, some would succeed beyond what was anticipated by the LMS and leave an enduring heritage of peace, faith, and community.

Another example from missions history that is relevant to the question of candidate assessment is the case of Dorothy Placket Carey, the wife of William Carey, who is widely considered to be “the father of modern missions” (Beck, 1993). William Carey was a missionary to India in the late 18th century who gained a reputation as a pioneer for the Evangelical missions movement because of his efforts to build schools for Indian children (including girls), his care for leper communities, and his ability to establish thriving churches (Timothy, 1992). He is also considered visionary for his establishment of a strong and sustainable overseas operation that fit the cultural milieu (Winter, 1994). His wife, however, is far less known and generally has the reputation of being an unworthy drag on the greatness of William Carey’s legacy (Beck, 1993). While it is unknown if the suspicions were unjustified, it is likely that she suffered from
Delusional Disorder, Jealous Type for 14 years on the mission field before succumbing to a fever and dying in 1807. In that span, she had been mostly locked in a room in her house because of attempted violence towards her husband. She had resisted going to the mission field from the beginning and considered herself mentally and physically unsuited for such stressful conditions as were found in rural India at that time.

While formal clinical procedures did not exist at that time to understand or treat Dorothy’s symptoms, evidence suggests that Dorothy was able to functionally cope with her symptoms in her home environment, but not in her host environment. It is likely that with some basic pre-screening of both Dorothy and William, the issues which led to her misery, confinement, and even her death could have been assessed and a plan could have been formulated. A workable plan might have created an environment in which Dorothy could have thrived and perhaps contributed. It is even likely under such a scenario that William’s work would have been more successful with the reduced stress and augmentation of his wife’s contributions (Beck, 1993). The question invited by the failures and successes of these early attempts to send out missionaries is a question that continues to be asked: how can the candidate selection process help ensure the success of such a large, important, and expensive undertaking as missionary work?

Missionary Psychological Assessment

Due to the independent and isolated nature of the typical missionary position, gathering data on missionary populations has been a difficult venture (Jensma, Pike, Duerkson, & Strauss, 1997). However, mission agencies have long been aware of the
many costs involved when missionaries prematurely leave the field (Ferguson, 1983). Some of those costs are the major financial expense involved from a failed investment, including the financial investment involved in training the missionary or in moving the missionary from their country of origin to the mission field. Financial losses can be up to 2.5 times the cost of the base salary of the missionary (Lindquist, 1982). Other costs are emotional, health, and career problems that result when missionaries return home early because of overwhelming challenges on site (Jensma, Pike, Duerkson, & Strauss, 1997). Although the exact figures are difficult to calculate across time and different organizations, attrition rates are high for missionaries, human capital is wasted, and there appears to be an exponential effect in terms of financial loss (Arndt & Lindquist, 1975; Lindquist, 1976, 1983; McKaughan, 1997; Taylor, 1997). Attrition costs sending agencies millions of dollars each year (Kyne, 1992).

Mission agencies have looked for salient factors that would help them predict attrition (Ferguson, 1983). Among those factors, mission organizations have become increasingly interested in psychological factors which predict success or attrition as opposed to physical or theological factors (Foyle, 1986; Ferguson, Kliweber, Lindquist, Williams, & Heinrich, 1983; Jensma, Pike, Duerkson, & Strauss, 1997). Initially, the integration of psychology into the missions community was slow because of the evangelical suspicion of psychology as a rival and a competing narrative to biblical authority (Hall & Schram, 1999). In the 1980s and 1990s the field of psychology became more accepted in the Evangelical community and its role in providing services to
missions organizations became more pronounced (Platt, 1997). Specifically, missions organizations began to take advantage of clinical and research developments to increase member care, reduce attrition rates, and increase focus on prevention—all while maintaining tight budgets (Hall & Schram, 1999).

In the most recent large-scale survey project undertaken by the international missions community, a strong positive correlation was found between a strong candidate selection process and missionary retention (Hay, Lim, Blocher, Ketelaar, & Hay, 2007). As psychological screening has shown effectiveness in predicting success and lowering attrition rates, mission agencies have attempted to ascertain the best use of psychological assessments. Britt (1983) found psychological assessment to be an effective predictor of success on the field, particularly between high and low success groups, with intermediate groupings being harder to differentiate. Hall and Sweatman (2002) have attempted to set standards for ethical and effective psychological assessments in the candidate selection process. They addressed the tendency to overestimate the importance of psychological assessments as having “crystal ball” powers. “From the vantage point of the mission board, many variables which are evaluated go beyond the scope of a psychological assessment, including, but not limited to doctrinal adherence, biblical knowledge, meeting the needs of the field, congruence with the vision of the agency, proven leadership, and perceived authentic Christian living” (Hall & Sweatman, 2002, p. 244). They went on to assert that a key component in the appropriate use of psychological assessment is for the sending agency and the testing agency to agree upon the goals of
assessment before the assessments are done. Due to their training, psychologists tend to look for psychopathology in testing results. In addition, the purpose of assessment is typically to ascertain fit for the unique demands put on a missionary, which are different from a typical employment situation in that:

“a) it is an around the clock, 24/7 job, rather than a 9 to 5, clock-in clock-out job
b) many aspects of the work environment (e.g., the streets of Bogota) cannot be controlled, because there are too many variables to predict
c) it is a representative job, in that the person functions as a representative of God in his or her context; and
d) it requires a cross-cultural transition” (Hall & Sweatman, 2002, p. 246).

Lindquist (1997) suggested four major aspects of attrition that can specifically be screened for during candidate psychological assessment. First, assessment can screen for background issues that are not problematic in the home culture, but may be triggered in cross-cultural contexts. Second, screening can identify unrealistic expectations of what daily work as a missionary will be like. Third, assessment can screen for an inability to manage interpersonal conflict. And lastly, assessing can identify patterns of coping with stressful conditions. Missionary work involves a high amount of environmental stress (Miersma, 1993). One survey found that 80% of their sample of missionaries currently in the field had experienced at least one traumatic stressor as a result of their work, with a mean score of 1.03 traumatic events per missionary (Irvine, Armentrout, & Miner, 2006). Thirty-five percent of missionaries who experienced a traumatic stressor were still
experiencing symptoms related to the traumatic incident ten years post-incident. Missionary work can also be stressful to marriages, as both partners learn to adapt to the unique conditions (Rosik & Pandzic, 2008). Given the unique demands of missionary work and the stressors involved, it is important to assess for resiliency across multiple dimensions of wellness, including spiritual, social, emotional, physical, occupational, and intellectual (Keckler, Moriarty, & Blagen, 2008).

A clear understanding of the candidate’s mental health is obviously important in order to make an informed selection decision. It is not absolutely necessary to exclude persons from consideration for missionary positions due to the presence of psychopathology (King, 1975). Instead, understanding psychopathology as it relates to stress resilience and availability of resources is an important goal of the candidate screening process. Also, knowledge of psychological status of the candidate can be important in knowing how availability of treatment and medications on the field may affect fit for particular placements (King, 1975; Hall & Sweatman, 2002). Ferguson (1983) listed “adaptability, flexibility, maturity, humility, sincerity, and willingness to work with others without the necessity of rewards” (p. 26) as essential and unique demands of missionary positions that should be assessed in the candidate selection process. Because personality disorders also affect stress resiliency, it is important to screen for them in the psychological assessment process (Schubert, 1991; 1993). Married women in missions environments may face more stress due to role strain than married men, which may be attributed to the variability in cultural expectations. Freedom to
choose a role that maximizes congruence with self-image is a salient factor in stress resiliency of married women missionaries (Hall & Duvall, 2003).

Ethical assessment of missionary candidates requires that the assessor has a competent grasp of the unique demands of a missionary position and how psychological assessment can help screen for individuals who will be able to meet these demands. Ethical assessment of missionary candidates also requires that assessment not be reliant on one source of information. A competent process includes a battery of assessments and a clinical interview (Hall & Sweatman, 2002; Schubert, 1999). Even if the assessment process is done holistically, the results of the assessments cannot be used alone to make hiring decisions. Those decisions will be made by the mission organization, as the assessment process is intended to supplement the hiring process, not replace it.

In attempting to standardize the psychological assessment process, Schubert (1999) suggested a seven-step process for maintaining integrity and decreasing attrition through a competent, clear, and professional assessment process. Her contribution both supports the literature referenced above and delineates new categories for standardization. She suggested that all mission agencies evaluate candidates for psychological fit, spiritual fit for their organization, consistency of letters of recommendations, interviews, and job and location match. Schubert proposed seven principles she felt were essential to a comprehensive pre-hire screening process for missionaries:
1. **Use of appropriate instruments.** The MMPI-2 and Life History Questionnaire are specifically listed as practical and cost-effective tools for gathering clinical data on the candidate. The Millon Clinical Multiaxial Inventory (MCMI) and the 16-PF are specifically discouraged. The MCMI is not normed for nonclinical populations and 16-PF does not yield relevant information for the purposes of the missionary candidate psychological assessment.

2. **Cost-effectiveness.** Mission agencies typically have tight budgets and will not be able to provide quality candidate screenings if the costs are prohibitive.

3. **Qualified professionals.** Assessors should have qualifications as a mental health professional, cross-cultural experience, and specific training using the MMPI-2 for the purpose of cross-cultural prediction, as it is different from using the MMPI-2 for clinical purposes.

4. **Professional-Mission relationship.** Missions organizations need to respect that psychological assessment may reveal data not available to them through their own interviews or personal contact.

5. **Spiritual/Psychological differentiation.** Spiritual and psychological domains may not be discreet, but it is important for sending agencies to be aware of the differentiation between a candidate’s sense of spiritual call and psychological factors (defense mechanisms, personality disorders, etc.) that may be influencing their subjective understanding of their call.
6. **No exceptions.** Missions organizations should resist “rush jobs” to get candidates out on the field before completing the assessment process. A high percentage of candidates requesting exceptions have psychological issues that are important for organizations to be aware of prior to field placement.

7. **Identification of the client.** Mental health professionals must be aware that the sending agency is the client, which demarcates different roles and boundaries than individual assessment. Mental health professionals should communicate clearly to all parties involved what their role in the process will and will not be.

**The MMPI as a Psychological Assessment Tool**

As the number of mission organizations that utilize psychological screening in their hiring process increases, the Minnesota Multiphasic Personality Inventory 2 (MMPI-2) has emerged as a practical, inexpensive, and efficient assessment tool (Schubert, 1999). The advantages and disadvantages of using the MMPI-2 and the emerging results in the literature will be discussed in this section, but first a look at the history of the MMPI and its use in candidate selection will provide background for its use in missionary candidate selection.

The original MMPI was developed as a diagnostic tool for psychiatric disorders (Hathaway & McKinley, 1940). Scales were constructed to measure the validity of the test and test-taking approach of the subject (i.e., defensiveness or infrequent responses). Clinical scales were also developed to measure psychopathology. The MMPI has become
one the most widely used psychological assessment tools since the 1960’s (Lubin, Larsen, & Matarazzo, 1984). However questions emerged regarding the standardization sample, item content, and efficacy of the clinical scales of the MMPI (Graham, 2006). In 1989, the MMPI-2 was published with a “more contemporary and representative standardization sample, updated and improved items, deletion of objectionable items, and some new scales” (p. 11). For purposes of this literature review, the discussion of the MMPI-2 will be focused on its use in the missionary candidate selection process, and therefore will not be comprehensive. For more information regarding the background, validity, and utility of the MMPI-2 please see Graham (2006), Butcher (2004), or Greene (1999) as valuable reference sources.

**MMPI and Candidate Assessment in High Attrition Settings**

Occupations that are high stress and have high attrition rates have obvious incentive to increase their ability to predict who will thrive in their field and who will not before hiring decisions are made. The MMPI-2 has been studied as a potential prescreening tool to decrease attrition rates in high-risk jobs. Law enforcement is a field with a high degree of stress and in which the integrity of officers is essential for preserving public trust. Sellbom, Fischler, and Ben-Porath (2007) studied the predictive validity of the MMPI-2 in identifying behavioral misconduct in police officers. Data from 291 male police officers who were given the MMPI-2 as part of their pre-hire administration were analyzed. Results for officers who experienced some kind of negative outcome, such as receiving complaints from civilians (n=87) were compared to officers who had not (n=
Results indicated that use of the K-corrected scales, which elevate certain scale T scores to account for overall defensiveness in test taking, was counterproductive because it can unnecessarily inflate some T scores, which supports other research that questions the appropriateness of using the K-corrected scales in non-clinical population (Barthlow, Graham, Ben-Porath, Tellegen, & McNulty, 2002). Results also indicated that several Restructured Clinical (RC) scales (RC3, RC4, RC6, and RC8) were meaningful and were associated with problematic behaviors. Overall, the RC scales showed more predictive validity than the Clinical scales.

The military is another occupational setting that is considered high stress and in which a premium is put on screening for individuals who may not be well-suited to making the psychological adjustments necessary to succeed. One study tested the predictive ability of the MMPI-1 in identifying Air Force cadets who were at risk for adjustment issues at the Air Force Academy (Lachar, Prediction of early U.S. Air Force Freshman cadet adaptation with the MMPI, 1974). MMPI-1 results were able to successfully predict which students “washed out” of the Academy.

Although not commonly regarded as a high stress “occupation,” one study of nuns compared MMPI-1 scores of those who left the convent with those who stayed. Results indicated that those who left had higher MMPI-1 scores on the 4, 8, and 9 scales and lower scores on the L and 0 scales than nuns who remained in the convent. These results suggest that the MMPI-1 had some predictive validity in religious settings where attrition may be an issue (Langston, 1970).
MMPI and Missionary Candidate Assessment

Many missions agencies have turned to the MMPI as a relatively inexpensive, efficient tool in the candidate selection process (Schubert, 1999). A small body of research has attempted to ascertain the predictive validity of the MMPI for missionary populations. Other research has studied which scales are salient for the unique characteristics of missionary candidates and high stress demands of the job. One study measured the validity of the MMPI-1 for predicting missionary performance (Schubert & Gantner, 1996). MMPI-1 protocols were distributed into “Yes,” “No,” and “Maybe” categories based on a 21 variable algorithm and missionaries were independently assessed for their performance on the field using the Missionary Assessment Scale. Results indicated that “Yes” predictions were accurate 77% of the time, “No” predictions were 71% accurate, and “Maybe” predictions were divided between 58% successes and 42% failures. Gender was not a significant factor in predicting attrition. Results indicated that the MMPI alone is not sufficient as an evaluation tool in candidate selection for missionaries, but it can be an informative part of the assessment process when other assessment results and a clinical interview are included in the process.

Another study compared mean T scores of 22 scales of the MMPI-1 profiles of 827 evangelical missionaries over 30 years with nonclinical normative samples using t-tests. The data also measured differences on the 22 scales between persevering and nonpersevering missionaries using ANOVAs (Dillon, 1983). Missionaries scored higher than the nonclinical normative sample on the L, K, Hy, and Mf scales. Missionaries
scored lower on the F, Hs, D, Pd, Pt, Sc, Ma, Dy, and Cn scales. These results indicate that the sample tended to present themselves in the most favorable light and were “somewhat visionary and a little impractical but had a strong ability to rebound from emotionally stressing problems” (p. 215). They also tended to have more independent and dominant personalities. Four scales were significant in differentiating between persevering and nonpersevering missionaries: L, F, Pt, and Cn. Perseverers tended to worry more, but were more controlled regarding symptoms. Nonperseverers tended to show more depression and thought disturbances.

Adams and Clopton (1990) measured Denial scale scores (a scale derived from items on Hy scale) of missionaries and found that missionaries with lower Denial scores were correlated with questioning of their mission organization and higher scores were positively correlated with feelings of satisfaction regarding their work and their sending organization. Results were interpreted by the authors as suggesting that a healthy level of denial can be helpful in adapting to the difficult demands of a missions position. Sprinkle (1989) studied 146 Southern Baptist missionaries by comparing MMPI scores of husbands and wives. Results indicated that average scores of husbands and wives were very similar. There was no difference in MMPI scores of persevering and non-persevering husbands, and very small differences in MMPI scores of persevering and non-persevering wives. Sprinkle concluded that the large degree of variability within the profiles of persevering missionaries may have confounded attempts to identify meaningful differences.
In another study, missionaries failed to find the predicted correlation between MMPI scores that indicated interpersonal difficulties and poor field performance, but several interesting correlations were found (Kyne, 1992). Results indicated that there were significant correlations related to gender. Persevering men scored significantly higher on scales 6 (Paranoia), Pa3 (Naivete), and Si3 (Staid Personal Rigidity) than nonpersevering men, while scoring significantly lower on Pd4a (Social Alienation), Ma1 (Amorality), and AUT (Authority Conflict) than nonpersevering men. These results suggest that persevering male missionaries tend to be sensitive, cooperative, trusting, and frank. They tend to express optimistic attitudes and value honest communication. They also tend to project blame onto others in difficult situations. Persevering women scored significantly higher on FEM (Feminine Interests), Pa3 (Naivete), and Si1 (Inferiority-Personal Discomfort) than nonpersevering women, while scoring significantly lower on scales 4 (Psychopathic Deviate), St (Social Status), Pd3 (Social Imperturbability) than nonpersevering women. These results suggest that persevering female missionaries tend to express a sense of belonging and social interest. They also tend to avoid leadership roles and embrace more traditional feminine roles. They may be shy and sensitive to criticism. Spouses of persevering male missionaries show a stronger tendency towards traditional feminine roles and may buffer their husband’s mistakes by engaging in self-blaming.

Cleveland (2008) examined MMPI-2 RC scales and missionary populations, studied hope as a salient concept in missionary success or failure but did not find
significant negative correlations between scores on the Adult Dispositional Hope Scale (ADH) and the RCd (Demoralization) scale or the RC2 (Low Positive Emotions) scale. Results did indicate a significant negative correlation between ADH scores and the Depression Content scale.
Chapter 3
Method

This study employs a quantitative methodology with analysis of the data archived in the missionary candidate assessment process at Missionary Care Services (MCS) in Littleton, Colorado.

Population and Sampling

A sample for the present study was selected from clients referred to MCS for psychological assessment as part of their candidacy process. MCS has served over 700 missionary and missionary candidate clients since being founded in 1990. From this archival data, participants were selected who were assessed during the candidate selection process. This approach avoided confounding variables from missionaries already serving in the field who were assessed following problems with their placement or who were assessed as a result of re-assignment within their mission organization. Some missionary candidates were referred for psychological services after their initial assessment and were required to complete that process and be assessed again before completing the hiring process. To avoid confounding variables, candidates who were assessed more than once during the hiring process had only their first assessment results considered for this study. This strategy presents a more accurate profile of candidates as they originally presented themselves for consideration and control for treatment effects. From the remaining
sample, children of missionary candidates under the age of 18 who were assessed as part of the process were not considered because of their age as well as the consideration that they were likely not involved in the active missionary work. Spouses of missionary candidates who were assessed were included in the sample unless the file specifically denoted that the spouse would not have any role in the missions work. Candidate files of married couples do not necessarily differentiate who is the candidate because both partners are typically candidates and the adjustment to cross-cultural missions will necessarily affect both partners (D. Fiel, personal communication, September 15, 2009). Sending organizations consider the investment and effectiveness of both partners as essential to success in missions work (Schubert, 1999). Occasionally MCS assesses missionary candidates from countries other than the United States. Participants who are not United States citizens were excluded from the sample to avoid confounding cultural or language variables. From the remaining sample, only participants who signed the MCS voluntary research consent form were considered for the present study. All participants who signed the form were verbally informed of the limits, rights, and purpose of their voluntary agreement and signed a form permitting all testing data to be used anonymously for research purposes.

MCS utilizes a battery of psychological assessments and a structured interview in their candidate assessment process. Included in the battery of assessments is the Taylor-Johnson Temperament Analysis (TJTA), Myers-Briggs Personality Type Indicator (MBTI), and the MMPI-2. Married couples were also given the ENRICH Marital
Inventory. Candidates who were not given or did not complete the MMPI-2 were not considered for the present study. Candidates who did not complete the assessment process were also not considered. The remaining participants constituted the sample for this study. Demographic data that was collected for participants were gender, marital status, year that the test was taken, sending organization, and age at the time of testing. The year that the assessment was completed was also collected.

**Procedures**

Data analyses were done for the MMPI-2 profiles of the selected sample of missionary candidates. Data were collected from hard copy files on location at MCS in Littleton, Colorado. Demographic information and MMPI-2 scale scores were manually entered into a database for statistical analysis using SPSS.

**Analysis of Data**

*Hypothesis 1: There is no statistically significant difference across MMPI-2 scale scores of missionary candidates.*

Data analysis of the first hypothesis consisted of performing repeated measure factorial analysis of variances (ANOVAs) to test for significant differences for the ten Clinical scales of the MMPI-2 ($\alpha = .05$).

*Hypothesis 2: There are no differences between MMPI-2 scale scores of missionary candidates and normative nonclinical samples for the MMPI-2.*
Data analysis of the second hypothesis consisted of performing one-sample t-tests ($\alpha = .05$) for the F, L, and K validity scales and the ten clinical scales. Because the MMPI-2 published nonclinical normative scale scores of persons presenting for employment by gender, this study divided the sample by gender for these analyses. Males from the sample were compared to males from the nonclinical normative sample and females from the sample were compared to females from the nonclinical normative sample.

*Hypothesis 3: There are no differences across scores divided into three separate groups according to time on MMPI-2 scores for missionary candidates.*

Data analysis of the third hypothesis consisted of performing one-way analysis of variances (ANOVAs) to test for significant differences ($\alpha = .05$) for the F, L, and K validity scales and the ten clinical scales across time. The data was divided into three time spans:

- **Group #1:** Missionary candidates assessed between 1992 and 2002
- **Group #2:** Missionary candidates assessed between 2003 and 2006
- **Group #3:** Missionary candidates assessed between 2007 and 2010

For each scale, one-way ANOVAs were used to compare mean T scores for each group and identify differences for each scale across time.
Chapter 4  
Results  

Sample Characteristics  

Participant Demographic Description  

Preliminary analyses were conducted to examine the characteristics of the sample. An issue that arose during the data collection process was that missionary candidates who were given the MMPI-2 prior to the year 2000 were not given research consent forms and therefore could not be included in the study, thus limiting both the sample size and the time interval over which profiles could be considered. A small number of participants (n=10) who were given the MMPI-2 prior to the year 2000 were included in the sample. These participants were seen again at Missionary Care Services after research consent forms became part of the initial paperwork package in 2000 and these participants chose to sign it at that time, which allowed for all data in their file to be used anonymously for research purposes. Participants who were seen again at Missionary Care Services after their initial candidate assessment should not be considered to be a representative sample of those assessed prior to the year 2000. It is likely that they were receiving services again because of problems on the field or needing to be reassessed again as a contingency of being hired as a result of problems that arose during the candidacy process. Analyses were conducted with the pre-2000 individuals included and not included and results did
not change significantly when these profiles were removed from the sample, so the following reflects analyses including pre-2000 individuals.

One implication of relatively few profiles in the sample from before 2000 relates to research question #3, which analyzed profiles for trends across time. The proposal for the study assumed that data would be collected from missionary candidates who were assessed between 1990 and 2010, which would provide a more robust time-frame by which to analyze the data for trends across time. However, almost all the profiles were from persons who were tested between 2000 and 2010, and the shorter time frame than was anticipated made it unlikely that trends would be detected, if those trends existed.

Table 1 presents demographic information on the sample population. The age of participants ranged from 18 to 68 (M= 33.12, SD= 7.94). Age was non-normally distributed with skewness of 1.10 (SE= .13) and kurtosis of .24 (SE= .25). There were more females (n=224) than males (n=153) in the sample, which can be attributed to there being more single female candidates (n=104) than single male candidates (n=30). The majority (64.4%) of the sample was married at the time of their assessment. There were 243 married persons in the sample, with 119 heterosexual married partners who were tested concurrently and 5 persons (1 male and 4 female, mean age= 33.2) who were assessed, but their partner was not. Ethnicity data were not collected during intake, so the ethnicity of each candidate is unknown, but senior staff at MCS estimated that more than 90% of persons assessed at Missionary Care Services were European-American, and
therefore, it can be assumed that the sample was primarily, but not exclusively, European-American.

Table 1

*Descriptive Statistics for the Sample*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>153</td>
<td>40.6</td>
</tr>
<tr>
<td>Female</td>
<td>224</td>
<td>59.4</td>
</tr>
<tr>
<td>Marital Status at Time of Testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>134</td>
<td>35.5</td>
</tr>
<tr>
<td>Married and tested at same time as partner</td>
<td>238</td>
<td>63.1</td>
</tr>
<tr>
<td>Married but partner not tested</td>
<td>5</td>
<td>1.3</td>
</tr>
<tr>
<td>Age at Time of Testing</td>
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<td></td>
</tr>
<tr>
<td>18-21</td>
<td>26</td>
<td>6.9</td>
</tr>
<tr>
<td>22-29</td>
<td>172</td>
<td>45.5</td>
</tr>
<tr>
<td>30-39</td>
<td>82</td>
<td>21.7</td>
</tr>
<tr>
<td>40-49</td>
<td>48</td>
<td>12.7</td>
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</tr>
<tr>
<td>60-68</td>
<td>16</td>
<td>4.2</td>
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<tr>
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<tr>
<td>Mean Age</td>
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<tr>
<td>Median Age</td>
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<tr>
<td>Modal Age</td>
<td>23</td>
<td></td>
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<tr>
<td>Year of Testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1992-1999</td>
<td>10</td>
<td>2.7</td>
</tr>
<tr>
<td>2000-2002</td>
<td>55</td>
<td>14.6</td>
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<tr>
<td>2003-2006</td>
<td>108</td>
<td>28.6</td>
</tr>
<tr>
<td>2007-2010</td>
<td>204</td>
<td>54.1</td>
</tr>
<tr>
<td>Year of Birth</td>
<td></td>
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</tr>
<tr>
<td>1946-1964 (Baby Boomer Generation)*</td>
<td>100</td>
<td>26.7</td>
</tr>
<tr>
<td>1965-1978(Generation X)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979-1999(Generation Y)*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. As defined by the United States Census Bureau*
**Sending Organization Characteristics**

The sample (n=377) consisted of 371 candidates who were referred from 30
different sending organizations and 6 candidates where the sending organization was not
recorded in their file, either because there wasn’t an identifiable sending organization for
the candidate (possibly because they were requesting assessment on their own) or the
sending information was accidentally not recorded. See Table 2 for information on
sending organizations. Four sending organizations (Overseas Missions Fellowship,
Cadence International, Compassion International, and Youth for Christ) accounted for
82.5% of the sample, with a mean of 77.8 candidates per organization. The other twenty-
seven sending organizations accounted for 15.9% of the sample, with a mean of 2.2
candidates per organization, and 1.6% of the sample (n= 6) did not have an identifiable
sending organization noted in their chart.
Table 2

*Sending Organization Characteristics*

<table>
<thead>
<tr>
<th>Sending Organization</th>
<th>Number of participants from sample</th>
<th>Percentage of participants from sample</th>
<th>Headquarters Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barnabas International</td>
<td>2</td>
<td>0.5%</td>
<td>Rockford, IL</td>
</tr>
<tr>
<td>Biblical Education by Extension (BEE) International</td>
<td>2</td>
<td>0.5%</td>
<td>Colorado Springs, CO</td>
</tr>
<tr>
<td>Cadence International</td>
<td>80</td>
<td>21.2%</td>
<td>Englewood, CO</td>
</tr>
<tr>
<td>Caleb Project</td>
<td>1</td>
<td>0.3%</td>
<td>Littleton, CO</td>
</tr>
<tr>
<td>Campus Crusades</td>
<td>2</td>
<td>0.5%</td>
<td>Orlando, FL</td>
</tr>
<tr>
<td>Cherry Hills Community Church</td>
<td>3</td>
<td>0.8%</td>
<td>Highlands Ranch, CO</td>
</tr>
<tr>
<td>Christian World Outreach</td>
<td>6</td>
<td>1.6%</td>
<td>Littleton, CO</td>
</tr>
<tr>
<td>Colorado Community Church</td>
<td>1</td>
<td>0.3%</td>
<td>Englewood, CO</td>
</tr>
<tr>
<td>Compassion International</td>
<td>34</td>
<td>9.0%</td>
<td>Colorado Springs, CO</td>
</tr>
<tr>
<td>East West Ministries</td>
<td>2</td>
<td>0.5%</td>
<td>Plano, TX</td>
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<tr>
<td>Evangelical Friends</td>
<td>5</td>
<td>0.3%</td>
<td>Brea, CA</td>
</tr>
<tr>
<td>Foothills Bible Church</td>
<td>1</td>
<td>0.3%</td>
<td>Littleton, CO</td>
</tr>
<tr>
<td>Great Commission Ministries</td>
<td>2</td>
<td>0.5%</td>
<td>Orlando, FL</td>
</tr>
<tr>
<td>Harvesting in Spanish</td>
<td>2</td>
<td>0.5%</td>
<td>Miami, FL</td>
</tr>
<tr>
<td>IDEAS</td>
<td>4</td>
<td>1%</td>
<td>Littleton, CO</td>
</tr>
<tr>
<td>International Family Missions</td>
<td>4</td>
<td>1%</td>
<td>Lafayette, CO</td>
</tr>
<tr>
<td>Josiah Venture</td>
<td>2</td>
<td>0.5%</td>
<td>Wheaton, IL</td>
</tr>
<tr>
<td>Living Spirit Ministries</td>
<td>2</td>
<td>0.5%</td>
<td>Swissvale, PA</td>
</tr>
<tr>
<td>Metro Church</td>
<td>3</td>
<td>0.8%</td>
<td>Denver, CO</td>
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<tr>
<td>Mission Hills Baptist Church</td>
<td>4</td>
<td>1%</td>
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<tr>
<td>Missions Ministries</td>
<td>3</td>
<td>0.8%</td>
<td>Castle Rock, CO</td>
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<td>Overseas Mission Fellowship</td>
<td>92</td>
<td>24.4%</td>
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<tr>
<td>People International</td>
<td>1</td>
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<td>Vancouver, WA</td>
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<td>Slavic Christian Ministries</td>
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<td>Turkish World Outreach</td>
<td>1</td>
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<td>Grand Junction, CO</td>
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<td>World Outreach Vision</td>
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<td>Sandy, UT</td>
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<td>World Venture</td>
<td>1</td>
<td>0.3%</td>
<td>Littleton, CO</td>
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<tr>
<td>Youth For Christ</td>
<td>105</td>
<td>27.9%</td>
<td>Englewood, CO</td>
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<tr>
<td>Youth Compass International</td>
<td>2</td>
<td>0.5%</td>
<td>Seattle, WA</td>
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<tr>
<td>Youth With a Mission</td>
<td>2</td>
<td>0.5%</td>
<td>Lindale, TX</td>
</tr>
<tr>
<td>Unknown</td>
<td>6</td>
<td>0.8%</td>
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</tbody>
</table>
The sending organizations all exclusively identified as Christian missionary organizations and also as Evangelical organizations. However, because Evangelical can be a blanket term that applies to a diversity of expressions of the Christian faith and because Evangelical organizations do not explicitly exclude persons that do not identify as Evangelicals, it can be assumed that the sample consisted of persons who identified as Christian and were in a selection process to do ecumenical work in a cross-cultural setting. It is also likely that the sample population predominantly identified as Evangelical.

**MMPI-2 Profile Characteristics**

Preliminary analyses were conducted to examine the characteristics of MMPI-2 profiles. Descriptive characteristics of the profiles are presented in Table 3.
Table 3
Sample Descriptive Statistics

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>T score range</th>
<th>Min. T score</th>
<th>Max. T score</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale F</td>
<td>44.97</td>
<td>5.93</td>
<td>36</td>
<td>36</td>
<td>72</td>
<td>1.07</td>
<td>1.70</td>
</tr>
<tr>
<td>Scale L</td>
<td>59.77</td>
<td>10.71</td>
<td>62</td>
<td>33</td>
<td>95</td>
<td>.28</td>
<td>-.01</td>
</tr>
<tr>
<td>Scale K</td>
<td>61.28</td>
<td>8.41</td>
<td>51</td>
<td>30</td>
<td>81</td>
<td>-.60</td>
<td>.32</td>
</tr>
<tr>
<td>scale1</td>
<td>52.22</td>
<td>7.27</td>
<td>45</td>
<td>33</td>
<td>78</td>
<td>.52</td>
<td>.83</td>
</tr>
<tr>
<td>scale2</td>
<td>47.87</td>
<td>7.61</td>
<td>47</td>
<td>30</td>
<td>77</td>
<td>.97</td>
<td>1.98</td>
</tr>
<tr>
<td>scale3</td>
<td>53.67</td>
<td>7.79</td>
<td>46</td>
<td>34</td>
<td>80</td>
<td>.22</td>
<td>.33</td>
</tr>
<tr>
<td>scale4</td>
<td>51.74</td>
<td>7.16</td>
<td>44</td>
<td>32</td>
<td>76</td>
<td>.35</td>
<td>.39</td>
</tr>
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<td>scale5</td>
<td>51.03</td>
<td>9.76</td>
<td>52</td>
<td>30</td>
<td>82</td>
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<td>.02</td>
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<tr>
<td>scale6</td>
<td>48.89</td>
<td>8.12</td>
<td>39</td>
<td>31</td>
<td>70</td>
<td>.20</td>
<td>-.43</td>
</tr>
<tr>
<td>scale7</td>
<td>51.49</td>
<td>7.20</td>
<td>49</td>
<td>30</td>
<td>79</td>
<td>.36</td>
<td>1.13</td>
</tr>
<tr>
<td>scale8</td>
<td>51.66</td>
<td>6.81</td>
<td>44</td>
<td>33</td>
<td>77</td>
<td>.30</td>
<td>.87</td>
</tr>
<tr>
<td>scale9</td>
<td>49.21</td>
<td>8.80</td>
<td>49</td>
<td>30</td>
<td>79</td>
<td>.71</td>
<td>.56</td>
</tr>
<tr>
<td>scale0</td>
<td>45.62</td>
<td>8.42</td>
<td>51</td>
<td>30</td>
<td>81</td>
<td>.95</td>
<td>1.33</td>
</tr>
</tbody>
</table>
Results Addressing Primary Research Questions

The next part of Chapter 4 presents results pertinent to addressing the three sets of primary research questions that were proposed in Chapter 1. Each set of questions examines different aspects of the profile of missionary candidates on the MMPI-2 to establish characteristics of a normative profile for this population. The development of a normative profile based on the sets of research questions are as follows:

1). Are there differences in means across scale scores for missionary candidates?
For the purpose of establishing a normative profile for the missionary candidate population, this research question identifies which scale scores, if any, are significantly higher or lower relative to other scale scores of the normative profile.

2). Are missionary candidates different from nonclinical populations? To establish a normative profile for the missionary candidate population, this research questions seeks to identify which scale scores, if any, are significantly higher or lower than the normative profile for the non-clinical sample. This research question addresses the main task of developing a normative profile for missionary candidates by testing whether missionary candidates are a unique population compared to population mean of those taking the MMPI-2 for employment purposes.

3). Are there trends over time on MMPI-2 scores among those who present for candidacy for missionary service? To establish a normative profile for the missionary candidate population, this research question seeks to identify changes on profiles over
time which may suggest trends in psychological characteristics of persons self-selecting for missionary work.

Each of the following sections will begin with a statement of the research question, followed by results of the data analyses used to address that question.

**Results: Research Question #1, Differences in Means across Clinical Scale Scores**

The first research question, as posed in Chapter 1, is whether the profile of scale scores on the MMPI-2 for missionary candidates is flat. Specifically, are there differences in means across clinical scale scores? The study results that address this question are found in Tables 3 and 4, and Figure 1. See Table 3 for descriptive statistics for the clinical scales for the sample. Figure 1 presents a graph of the mean scale scores in a format similar to how it would be presented in an MMPI-2 report.
Figure 1
Mean T Scores for the Missionary Candidate Sample
Assumptions regarding normality were tested and met. Mauchly’s test indicated that the assumption of sphericity had been violated ($\chi^2(44) = 963.9, p < .001$), therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = 0.63$). The mean scores for the clinical scales were statistically significantly different, $F(5.70, 3384)=41.40, p<.001$. Analysis showed a medium effect size (partial eta squared = .099). Bonferroni post-hoc pairwise comparisons indicated that scale 3 (Hysteria) had a significantly higher mean than all the other scales and scale 0 (Social Introversion) had a significantly lower mean than all the other scales. Complete results of pairwise comparisons for each scale are presented in Appendix A.
Table 4

*Main Effects of Flatness for Clinical Scales*

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Scale</td>
<td>9553333.91</td>
<td>1</td>
<td>9553333.91</td>
<td>60817.75</td>
<td>&lt;.001</td>
<td>.994</td>
</tr>
<tr>
<td>Error</td>
<td>59062.59</td>
<td>376</td>
<td>157.08</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Tests of Within-Subjects Effects for Repeated Measures ANOVA of Clinical Scales*

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flatness</td>
<td>19590.87</td>
<td>5.70</td>
<td>3435.08</td>
<td>41.40</td>
<td>&lt;.001</td>
<td>.099</td>
</tr>
<tr>
<td>Error</td>
<td>177919.63</td>
<td>2144.39</td>
<td>82.97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Results: Research Question #2, Profile of Missionary Candidates compared to the Nonclinical Normative Population**

The second research question is whether missionary candidates are different from nonclinical populations presenting for employment. Specifically, are there differences in mean scores on the clinical scales between the sample population and the nonclinical population of persons taking the MMPI-2 for employment purposes? The MMPI-2 nonclinical population was normed by gender, so the data were analyzed by gender, with male missionary candidates being compared to males from the nonclinical normative population and female missionary candidates being compared to females from the nonclinical normative population. This study used a one-sample t-test to compare means.
on the F, L, and K validity scales and the ten clinical scales between the sample of missionary candidates and the nonclinical population. Assumptions regarding normality were tested. Assumptions of normality for the F scale for males and Scale 2 for females were violated. Assumption of normality was not violated when outliers were excluded. Analyses did not significantly change when the outlier cases were excluded and therefore the cases were left in the analysis.

Results indicated that the male missionary candidate sample was significantly different from the nonclinical normative population on ten of the thirteen scales analyzed. Scores on Scales F, 4 (Psychopathic Deviate), and 9 (Hypomania) were not significantly different. In every case in which the scales were different, the missionary candidate mean scale score was higher than the nonclinical normative mean scale score. Results were statistically but not clinically significant, meaning that the differences did not inflate any scale to a level which would be interpreted clinically. Results indicated that the female missionary candidate sample was significantly different from the nonclinical normative population also on ten of the thirteen scales analyzed. Mean scores on Scales 4 (Psychopathic Deviate), 5 (Mf), and 6 (Paranoia) were not significantly different. In every case in which the scales were significantly different, the missionary candidate mean scale score was higher than the nonclinical normative mean scale score, except for scale 9 (Hypomania), which was significantly lower than the nonclinical normative sample mean scale score. Results were again statistically but not clinically significant.
The overall pattern of the validity scales is similar for both genders. Specifically, the L and K scales, which generally measure if someone is defensive or trying to “fake good” were higher than the F scale, which is generally a measure of malingering or trying to “fake bad.” The K scale has the highest mean T score for both men and women in the sample ($M = 60.50, SD = 8.34$ and $M = 61.81, SD = 8.44$, respectively). For both men and women, the pattern of the validity scales is similar to the respective nonclinical normative populations.

When comparing the scores of men and women in the sample, there were two statistically significant differences. Women in the sample had higher scores than men in the sample on the F scale ($t(356) = -4.18, p < .001$) and scale 5 ($t(356) = -7.45, p < .001$). Scale 5 (Mf) is interpreted differently based on gender. For men, higher scores on Scale 5 indicate less stereotypical masculine interests. Therefore, results indicated that the male missionary candidate sample endorsed less stereotypically masculine interests than the male nonclinical normative population. For women, higher scores generally indicate less stereotypically feminine interests. Therefore, results indicated that the female missionary candidate sample endorsed similar acceptance of traditional feminine roles as the female nonclinical normative population. In summary, males in the missionary candidate sample endorsed more traditional gender expression than the females in the missionary candidate sample, but less traditional gender expression than the male nonclinical normative population.
The study results that address this question are found in the next 7 tables and figures. Table 5 presents a comparison of the results of men and women in the sample. Table 6 presents the mean scores on the validity and clinical scales for the sample population and the nonclinical normative population for men. Table 7 presents the mean scores on the validity and clinical scales for the sample population and the nonclinical normative population for women. Figure 2 presents data comparing men and women in the sample. Figure 3 presents data comparing men in the sample to men in the nonclinical normative population. Figure 4 presents data comparing women in the sample to women in the nonclinical normative population. Figure 5 presents the data from Figures 2 and 3 together for a visual comparison.
Table 5
Comparison of T Scores of Men and Women in the Missionary Candidate Sample

<table>
<thead>
<tr>
<th>Scale</th>
<th>Male Sample Mean T Score</th>
<th>Female Sample Mean T Score</th>
<th>Mean Difference between Male and Female Mean T Score</th>
<th>Equality of Variances Assumed</th>
<th>t-test for Equality of Means</th>
<th>Significance</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Scale</td>
<td>43.50</td>
<td>45.97</td>
<td>-2.48</td>
<td>No</td>
<td>-4.18</td>
<td>&lt;.001</td>
<td>.042</td>
</tr>
<tr>
<td>L Scale</td>
<td>59.01</td>
<td>60.29</td>
<td>-1.29</td>
<td>Yes</td>
<td>-1.15</td>
<td>.252</td>
<td>.004</td>
</tr>
<tr>
<td>K Scale</td>
<td>60.50</td>
<td>61.81</td>
<td>-1.31</td>
<td>Yes</td>
<td>-1.49</td>
<td>.138</td>
<td>.006</td>
</tr>
<tr>
<td>Scale 1</td>
<td>52.32</td>
<td>52.16</td>
<td>.16</td>
<td>Yes</td>
<td>.22</td>
<td>.830</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Scale 2</td>
<td>48.14</td>
<td>47.68</td>
<td>.46</td>
<td>Yes</td>
<td>.58</td>
<td>.565</td>
<td>.001</td>
</tr>
<tr>
<td>Scale 3</td>
<td>53.79</td>
<td>53.59</td>
<td>.20</td>
<td>Yes</td>
<td>.24</td>
<td>.810</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Scale 4</td>
<td>51.65</td>
<td>51.80</td>
<td>-.16</td>
<td>Yes</td>
<td>-.21</td>
<td>.835</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Scale 5</td>
<td>46.90</td>
<td>53.84</td>
<td>-6.94</td>
<td>No</td>
<td>-7.45</td>
<td>&lt;.001</td>
<td>.122</td>
</tr>
<tr>
<td>Scale 6</td>
<td>49.36</td>
<td>48.56</td>
<td>.80</td>
<td>Yes</td>
<td>.94</td>
<td>.350</td>
<td>.002</td>
</tr>
<tr>
<td>Scale 7</td>
<td>51.42</td>
<td>51.54</td>
<td>-.13</td>
<td>Yes</td>
<td>-.17</td>
<td>.867</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Scale 8</td>
<td>51.28</td>
<td>51.91</td>
<td>-.63</td>
<td>Yes</td>
<td>-.88</td>
<td>.379</td>
<td>.002</td>
</tr>
<tr>
<td>Scale 9</td>
<td>48.85</td>
<td>49.46</td>
<td>-.61</td>
<td>Yes</td>
<td>-.66</td>
<td>.512</td>
<td>.001</td>
</tr>
<tr>
<td>Scale 0</td>
<td>45.51</td>
<td>45.69</td>
<td>-.18</td>
<td>Yes</td>
<td>-.20</td>
<td>.841</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Note. Significant Results are in Bold
Figure 2
Male and Female Sample Mean T Scores

Legend
- malesample
- femalesample
Table 6

*T Scores of Males in the Missionary Candidate Sample Compared to Males in the Nonclinical Normative Population*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Male Sample Mean T Score</th>
<th>Male Sample Std. Deviation</th>
<th>Male Sample Std. Error Mean</th>
<th>Male Nonclinical Normative Population Mean T Score</th>
<th>t-test value</th>
<th>Significance</th>
<th>Cohen’s D</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Scale</td>
<td>43.50</td>
<td>5.28</td>
<td>.43</td>
<td>43</td>
<td>1.17</td>
<td>.246</td>
<td>.095</td>
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<tr>
<td>L Scale</td>
<td>59.01</td>
<td>10.51</td>
<td>.85</td>
<td>56</td>
<td>3.54</td>
<td>&lt;.001</td>
<td>.286</td>
</tr>
<tr>
<td>K Scale</td>
<td>60.50</td>
<td>8.34</td>
<td>.67</td>
<td>58</td>
<td>3.71</td>
<td>&lt;.001</td>
<td>.300</td>
</tr>
<tr>
<td>Scale 1</td>
<td>52.32</td>
<td>6.69</td>
<td>.54</td>
<td>48</td>
<td>7.99</td>
<td>&lt;.001</td>
<td>.646</td>
</tr>
<tr>
<td>Scale 2</td>
<td>48.14</td>
<td>7.88</td>
<td>.64</td>
<td>46</td>
<td>3.36</td>
<td>&lt;.001</td>
<td>.272</td>
</tr>
<tr>
<td>Scale 3</td>
<td>53.79</td>
<td>7.43</td>
<td>.60</td>
<td>50</td>
<td>6.31</td>
<td>&lt;.001</td>
<td>.510</td>
</tr>
<tr>
<td>Scale 4</td>
<td>51.65</td>
<td>7.12</td>
<td>.58</td>
<td>51</td>
<td>1.12</td>
<td>.263</td>
<td>.091</td>
</tr>
<tr>
<td>Scale 5</td>
<td>46.90</td>
<td>8.30</td>
<td>.67</td>
<td>43</td>
<td>5.82</td>
<td>&lt;.001</td>
<td>.470</td>
</tr>
<tr>
<td>Scale 6</td>
<td>49.36</td>
<td>8.27</td>
<td>.67</td>
<td>48</td>
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<td>.044</td>
<td>.164</td>
</tr>
<tr>
<td>Scale 7</td>
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<td>7.63</td>
<td>.62</td>
<td>48</td>
<td>5.54</td>
<td>&lt;.001</td>
<td>.448</td>
</tr>
<tr>
<td>Scale 8</td>
<td>51.28</td>
<td>7.16</td>
<td>.58</td>
<td>47</td>
<td>7.40</td>
<td>&lt;.001</td>
<td>.598</td>
</tr>
<tr>
<td>Scale 9</td>
<td>48.85</td>
<td>8.65</td>
<td>.70</td>
<td>50</td>
<td>-1.65</td>
<td>.102</td>
<td>.133</td>
</tr>
<tr>
<td>Scale 0</td>
<td>45.51</td>
<td>8.20</td>
<td>.66</td>
<td>43</td>
<td>3.79</td>
<td>&lt;.001</td>
<td>.306</td>
</tr>
</tbody>
</table>

*Note. N = 153, Significant Results are in Bold*
Figure 3
Male Mean T Scores For the Missionary Candidate Sample and the Nonclinical Normative Population

legend

- male sample
- male nonclinical normative
Table 7
*T* Scores of Females in the Missionary Candidate Sample Compared to Females in the Nonclinical Normative Population

<table>
<thead>
<tr>
<th>Scale</th>
<th>Female Sample Mean T Score</th>
<th>Female Sample Std. Deviation</th>
<th>Female Sample Std. Error Mean</th>
<th>Female Nonclinical Normative Population Mean T Score</th>
<th>t-test value</th>
<th>Significance</th>
<th>Cohen’s D</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Scale</td>
<td>45.97</td>
<td>6.15</td>
<td>.41</td>
<td>45</td>
<td>2.37</td>
<td>.019</td>
<td>.158</td>
</tr>
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<td>L Scale</td>
<td>60.29</td>
<td>10.83</td>
<td>.72</td>
<td>55</td>
<td>7.32</td>
<td>&lt;.001</td>
<td>.488</td>
</tr>
<tr>
<td>K Scale</td>
<td>61.81</td>
<td>8.44</td>
<td>.56</td>
<td>57</td>
<td>8.54</td>
<td>&lt;.001</td>
<td>.570</td>
</tr>
<tr>
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<td>52.16</td>
<td>7.66</td>
<td>.51</td>
<td>48</td>
<td>8.13</td>
<td>&lt;.001</td>
<td>.543</td>
</tr>
<tr>
<td>Scale 2</td>
<td>47.68</td>
<td>7.44</td>
<td>.50</td>
<td>46</td>
<td>3.39</td>
<td>&lt;.001</td>
<td>.226</td>
</tr>
<tr>
<td>Scale 3</td>
<td>53.59</td>
<td>8.04</td>
<td>.54</td>
<td>50</td>
<td>6.69</td>
<td>&lt;.001</td>
<td>.447</td>
</tr>
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<td>51.80</td>
<td>7.20</td>
<td>.48</td>
<td>52</td>
<td>-.41</td>
<td>.684</td>
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<td>9.69</td>
<td>.65</td>
<td>55</td>
<td>-1.79</td>
<td>.076</td>
<td>.120</td>
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<td>48.56</td>
<td>8.01</td>
<td>.54</td>
<td>49</td>
<td>-1.82</td>
<td>.415</td>
<td>.055</td>
</tr>
<tr>
<td>Scale 7</td>
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<td>6.91</td>
<td>.46</td>
<td>48</td>
<td>7.67</td>
<td>&lt;.001</td>
<td>.512</td>
</tr>
<tr>
<td>Scale 8</td>
<td>51.91</td>
<td>6.56</td>
<td>.44</td>
<td>49</td>
<td>6.64</td>
<td>&lt;.001</td>
<td>.444</td>
</tr>
<tr>
<td>Scale 9</td>
<td>49.46</td>
<td>8.91</td>
<td>.60</td>
<td>51</td>
<td>-2.60</td>
<td>.001</td>
<td>.327</td>
</tr>
<tr>
<td>Scale 0</td>
<td>45.69</td>
<td>8.58</td>
<td>.57</td>
<td>43</td>
<td>4.69</td>
<td>&lt;.001</td>
<td>.314</td>
</tr>
</tbody>
</table>

*Note. N = 224, Significant Results are in Bold*
Figure 4
Female Mean T Scores For the Sample and the Nonclinical Normative Population
Figure 5
Male and Female Mean T Scores For the Sample and the Nonclinical Normative Population
Results: Research Question #3, Trends Over Time

The third research question, as posed in Chapter 1, is whether there are trends across time on MMPI-2 scores in those presenting for candidacy for missionary service. This study used a one-way ANOVA with year of testing as the factor to compare mean scores on the F, L, and K validity scales and the ten clinical scales by date of testing. Assumptions regarding homogeneity of variance were tested and met. Assumptions regarding normality were tested. Assumptions of normality for scale 0 and the F scale for persons tested between 2003 and 2006 were violated. Assumption of normality was not violated when one outlier on each scale was excluded. Analyses did not significantly change when the outlier case was excluded and therefore the case was left in the analysis. Results indicated that the missionary candidate sample was significantly different by date of testing on the K scale ($F(2,374) = 3.13, p=.045$, partial eta squared = .016). Post hoc comparisons using the Tukey HSD test indicated that the mean score for the candidates tested between 1992 and 2002 (M = 63.48, SD = 6.83) was significantly higher than candidates tested between 2003 and 2006 (M = 60.22, SD = 9.02) and candidates tested between 2007 and 2010 (M = 61.14, SD = 8.44). Table 8 presents descriptive statistics by year of testing. Table 9 presents results of the univariate tests of group means for the validity scales and the ten clinical scales by year of testing.
Table 8

*Descriptive Statistics for Date of Testing*

<table>
<thead>
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Table 9

*Tests of Between-Subjects Effects for One Way ANOVA for Date of Testing*

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*Note. Significant Results are in Bold*
Additional Research Question

As previously discussed in this chapter, research consent forms did not become part of the assessment process at MCS until 2000. Therefore the data collected were from missionary candidates who were tested predominantly between 2000 and 2010, as opposed to from 1990 to 2010 as originally anticipated in the research proposal. This unanticipated problem with data collection likely contributed to only one significant result for research question #3, which looked for trends across time in missionary candidate profiles.

It was decided to consider an additional research question that looked for trends across time in a way that might be statistically more robust. The additional research question was: are there trends by date of birth on MMPI-2 scores among those who presented for candidacy for missionary service? To establish a normative profile for the missionary candidate population, this research question seeks to identify generational differences which may suggest trends in psychological characteristics of persons self-selecting for missionary work. Instead of analyzing the data by date of testing, which was constricted to a relatively narrow ten year range, the data were analyzed to look for trends by date of birth. U.S. Census Bureau definitions were used to divide the sample population by generation (“Population Profile of the United States,” n.d.). All participants in the study fell into the category of Baby Boomer (born before 1965), Generation X (born between 1965 and 1978), and Generation Y (born after 1978). Analyzing the data
by year of birth divided the sample into three roughly equal sized groups. Table 10 presents descriptive statistics by generation. Table 11 presents results of the univariate tests of group means for the validity scales and the ten clinical scales by generation.

This study used a one-way ANOVA to compare means on the F, L, and K validity scales and the ten clinical scales by generation. Assumptions regarding homogeneity of variance were tested and met. Assumptions regarding normality were tested. Assumptions of normality for the F scale for Baby Boomers were violated. Assumption of normality was not violated when one outlier was excluded. Analyses did not significantly change when the outlier case was excluded and therefore the case was left in the analysis. Results indicated that the missionary candidate sample was significantly different by date of birth on the K scale \( F(2,372) = 9.74, p<.001 \), partial eta squared = .050. Post hoc comparisons using the Tukey HSD test indicated that the mean score for Generation Y candidates (M = 58.87, SD = 9.01) was significantly lower than Baby Boomer candidates (M = 63.48, SD = 7.56) and Generation X candidates (M = 61.86, SD = 7.94).

Results also indicated that the missionary candidate sample was significantly different by date of birth on Scale 1 \( F(2,372) = 5.01, p=.007 \), partial eta squared = .026). Post hoc comparisons using the Tukey HSD test indicated that the mean score for Baby Boomer candidates (M = 53.83, SD = 7.65) was significantly higher than Generation Y candidates (M = 50.82, SD = 7.16).
Table 10

_Descriptive Statistics for Year of Birth_

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Table 11

Tests of Between-Subjects Effects for One Way ANOVA for Year of Birth

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<td>Scale 5</td>
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<td>131.03</td>
<td>1.38</td>
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</tr>
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<td>Scale 6</td>
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<td>Scale 7</td>
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<td>1.05</td>
<td>.352</td>
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Note

*Significant Results are in Bold*
Chapter Summary

In this chapter, the results of the data analyses were presented along with a brief description of how the results answered the research questions. A discussion of these results along with limitations, implications, and suggestions for future research will be presented in the next chapter.
Chapter 5
Discussion

Overview of Chapter

This chapter presents a summary of major findings of the study along with a discussion of results relative to other literature in this area. Implications of the results for psychological assessment of missionary candidates are discussed. Study limitations are presented in the following categories: sampling limitations, diversity limitations, and conceptual limitations. Finally, recommendations are made for future research.

This study sought to establish a normative profile on the MMPI-2 for missionary candidates, as measured by the sample of missionary candidates who were assessed as part of their hiring process through Missionary Care Services (MCS). The primary question of the study was whether missionary candidates constitute a unique population for which having a normative profile on the MMPI-2 would increase interpretive validity. Additional questions were posed to determine if there were trends across time that may influence the establishment of a normative profile and whether date of birth was a factor in the establishment of a normative profile.

There were four sets of research questions related to the purpose of the study. The first question sought to establish MMPI-2 mean scale scores for the sample and to identify which scales, if any, were significantly higher or lower relative to other scales of the sample population. The second question sought to identify which MMPI-2 scale
scores from the sample, if any, were significantly different from the nonclinical normative population. The third question sought to identify significant differences on MMPI-2 profiles over time based on the date of testing of the candidates. Due to limitations related to data collection for candidates assessed before 2000, an additional research question was posed which sought to identify changes on MMPI-2 profiles over time based on the year of birth of the sample population. Results are discussed from the perspective the impact of each question on the development of a normative profile on the MMPI-2 for missionary candidates.

**Summary Answers to Study Questions**

Discussion of the results to all the following questions will be addressed in depth in the pages that follow. A concise summary is presented below to provide a brief overview of questions and results.

1) Are there differences in means across scale scores for missionary candidates?
   
   Answer: Yes

2) Are missionary candidates different from the nonclinical population?
   
   Answer: Yes

3) Are there trends based on date of testing on MMPI-2 scores among those who present for candidacy for missionary service?
   
   Answer: Yes
4) (additional research question) Are there trends by date of birth on MMPI-2 scores among those who present for candidacy for missionary service?

Answer: Yes

Summary of Responses to Research Questions

The answers were affirmative for the four study questions. In sum, the results appear to suggest that some of the mean scale scores for missionary candidates on the F, L, and K validity scales and the clinical scales on the MMPI-2 are significantly different from the nonclinical normative sample. The profile of missionary candidates found in this study was also different by date of testing and by date of birth. These differences suggest the need for the establishment of a normative profile, and offers some areas of consideration for increasing interpretive validity and improving the missionary candidate assessment process.

Discussion of Demographic Results

The demographic variables included gender, marital status at the time of testing, age at the time of testing, year of testing, and year of birth. There were more females (n=224) than males (n=153) in the sample, with females accounting for 59.4% of the sample. There were more single female candidates (n=104) than single male candidates (n=30). There do not appear to be any data in the literature as to whether demographics for the sample related to gender and marital status are endemic to this study or are broadly representative of persons presenting for missionary service. A follow-up study that measures whether single persons presenting for missionary service are more likely to
be female would have implications for both training and placement. Cultural expectations and safety issues for single women are different in many parts of the world compared to America. If the demographics of this sample are indicative of broader missionary candidate demographics, then allocating resources to better support the needs of single women would be an important part of the preparation and placement process. Almost two-thirds of the sample (64.4%) were married at the time of testing. Again, it is unclear in the literature if this is representative of the missionary candidate population.

Schubert and Gantner (1996) found missionaries in their sample between the ages of 19-30 to be the most successful in completing their term, and missionaries between the ages of 30-39 to be the least successful. They hypothesized that family obligations negatively affected missionary effectiveness, with the youngest candidates being least encumbered by family obligations and freer to focus on the missionary endeavor. Missionaries in their 30s would be more likely to be married and starting a family, and possibly in the beginning stages of caring for aging parents, which would increase stress levels and non-vocational obligations. The mean age for the missionary candidate sample in this study was 33.12 (SD= 7.94), indicating that the sample tended to be in the age group that may struggle most to successfully complete their term. If a candidate has children, assessing the whole family may improve the candidate assessment process. Also, discussing extended family roles, obligations, expectations, and plans are a vital process in the clinical interview of the assessment process. Assessing children, the quality
of family interactions, and non-vocational obligations of the candidate would provide important context by which to more accurately interpret MMPI-2 profiles.

**Discussion of Establishment of a Normative Profile**

This section discusses how the results of the study contribute to the establishment of a normative profile on the MMPI-2 for missionary candidates. Normative profiles for the MMPI-2 have been established for unique and high attrition employment populations, such as police officers, to establish norms for comparative purposes and enhance interpretive validity for that context. In the case of missionary candidates, attrition is a major problem (Arndt & Lindquist, 1975; Ferguson, 1983; Lindquist, 1976, 1982, 1983; McKaughan, 1997; Taylor, 1997). The purpose of the present study was, first, to enhance interpretive validity of MMPI-2 profiles by establishing mean scale scores for missionary candidates and to determine whether those scores are unique compared to the MMPI nonclinical normative population. Secondly, the present study aimed to identify patterns and trends for the normative profile for missionary candidates which may influence healthy adjustment to the rigors of missionary work and cross-cultural experiences. Finally, establishing a normative profile to which missionary candidates are compared may help alleviate fears that some Christians have that MMPI-2 scores will unfairly pathologize them because of their faith-oriented worldview and give them more confidence in the candidate assessment process.
Discussion of Establishment of Mean Scale Scores

An important aspect of the results of establishing mean scale scores on the MMPI-2 for the F, L, and K validity scales and 10 clinical scales is that none of the mean scale scores were at clinically significant levels (T > 65). One implication of this is that, while the missionary candidate sample appears to have unique characteristics, the overall strategy of interpreting an MMPI-2 profile does not substantially change for the missionary candidate population. Any missionary candidate MMPI-2 profile should be interpreted in the context of the MMPI-2 interpretive manual. As with any psychological assessment tool, no single data point should be interpreted in isolation, but within the context of the whole MMPI-2 profile as well as in the context of other data that is known about the candidate. This was the case in interpreting MMPI-2 profiles of missionary candidates before the establishment of a normative profile for this population and continues to be the case in light of establishing a normative profile for missionary candidates.

Discussion of Comparing the Sample to the MMPI-2 Normative Population

The data provided by the MMPI-2 are normed by gender, and therefore the mean T scores of male missionary candidates were compared to male population T scores, and the mean T scores of female missionary candidates were compared to female population T scores. When the missionary candidate sample was compared to the normative population, there were significant differences for 10 of the 13 scales for both men and women. This would appear to affirm the missionary candidate sample as unique and
validate the development of a normative profile to more effectively serve this population. See Chapter 4, Tables 5, 6, and 7 for summary tables with complete data on these analyses. The following section considers implications of each scale for missionary candidates.

The Validity Scales

Data were collected for the F, L, and K validity scales. High scores on the F scale are generally indicative of over-reporting of symptomology, severe psychopathology, or malingering. High scores on the L and K scales are generally indicative of trying to present in an overly favorable light. Taken together, these scales can create a snapshot of the test-taking posture of the candidate and provide an important context for interpreting the clinical scales. For male missionary candidates, there were significant differences compared to the normative population on the L and K scales (t = 3.54, p< .001, and t = 3.71, p< .001, respectively), and for female missionary candidates, there were significant differences from the normative population on the F, L, and K scales (t = 2.37, p=.019, t = 7.32, p< .001, and t = 8.54, p< .001, respectively). In all the cases in which there were significant differences, the missionary candidate mean T score was higher than the mean for the normative population.

One interpretive consideration of these results is that while there are differences in the mean T scores of the validity scales, the overall pattern of the validity scales remains unchanged. The pattern for both the missionary candidate sample and the normative population is of an ascending pattern in which the F scale score is comparatively low, the L scale is distinctly higher than the F scale, and the K scale marks a small uptick
compared to the L scale. In using the validity scales to interpret the test-taking posture of the examinee, this pattern (in addition to being below the clinical elevation threshold of T<65) is correlated with a “normal” and valid profile in which the respondent appeared to answer questions honestly.

Another interpretive consideration from the development of a normative profile for missionary candidates is that because mean T scores for missionary candidates are higher than the normative population, mild elevations of the validity scales may be of less interpretive concern for this population than deviation from the pattern of the validity scales, which follows the same pattern as the normative population. Moderate to extremely elevated T scores on any validity scale should warrant attention, but mild elevations should be interpreted with caution for missionary candidates, likewise a deviation from the pattern of the validity scales is an important consideration in interpreting elevated scores.

Given the discussion in the missionary candidate literature questioning the utility of the K scale, a more thorough discussion of this scale is also warranted here. For both males and females the K scale was significantly different than the normative population (t = 3.71, p<.001, and t = 8.54, p<.001, respectively). In both cases, the missionary candidate mean T score was higher than the mean for the normative population T scores. The effect size for males was medium (Cohen’s D=.300) and the effect size for females was large (Cohen’s D=.570). The K scale was developed to detect defensiveness in respondents to which the L scale was not sensitive. A high L score suggests that the
respondent may be deliberately misrepresenting themselves to appear in a more favorable light. An elevated K scale suggests a more subtle attempt of an examinee to portray themselves in a favorable light. It is a reasonable assumption that a person taking the MMPI-2 in an evaluative environment, such as the missionary candidate process, would be interested in appearing in a favorable light and motivated to protect the status of their candidacy. This situation would likely inflate the K scale, and in turn, inflate the K correction added to Scales 1, 4, 7, 8, and 9. However, the K scale is higher for missionary candidates compared even to the normative population for those assessed for employment purposes. This suggests that there may be more affecting the K scale for missionary candidates than the normal desire to appear in a favorable light in the candidacy process.

It may simply be that the missionary candidates in this sample were more defensive and less willing to disclose problems than others presenting for employment purposes, but there are no other data which support this conclusion. Another possibility is that missionary candidates may perceive a double-bind in certain questions that may create an overall defensive posture toward the assessment. Missionary candidates, by definition, are likely to have a highly religious orientation. As a result of this orientation, certain questions may trigger cognitive dissonance. When a missionary candidate reads the question, “I hear strange things when I am alone,” “I often hear voices without knowing where they are coming from,” or “evil spirits possess me at times,” they may feel forced on a subtle level to make a decision how to proceed with the assessment. Because of their religious orientation and the purpose of the assessment, they are likely to
read these questions in a religious context and feel that it is true that God speaks to them and they do not always understand it, or that they are caught up in a spiritual war that is likely to intensity if they engage in vocational religious work. They are also likely to have intuited that the MMPI-2 is pulling for them to disclose psychopathology patterns, or they may have heard that this is the purpose of this assessment tool. And thus, a double-bind may develop: should they answer these questions honestly, and risk being pathologized by the assessment and potentially risk their candidacy, or should they answer dishonestly to keep with what they perceive as the spirit of the assessment. 

Whatever choice is made in this double-bind, the candidate is now in a more defensive posture in which they are attempting to read the questions for what they might be trying to “pull for” and how they might stigmatize the examinee, rather than responding in an unself-conscious manner. This may change how the candidate answers questions in which they perceive a double bind around their religious orientation, but also change their posture regarding the assessment as a whole to a more defended position. In this defended context, questions such as “I have often wished I were a girl. (Or if you are a girl) I have never been sorry that I am a girl” or “I believe I am being plotted against” may now be perceived as loaded questions which are attempting to stigmatize their faith orientation as pathological. This may account for higher K scores for missionary candidates compared to other persons presenting for employment purposes, and argues for caution in interpreting the K scale and K corrections which are add to Scales 1, 4, 7, 8, and 9.
The Clinical Scales

Results indicated that the male missionary candidate sample was significantly different from the nonclinical normative population on eight of the ten scales analyzed. Scores on Scales 4 (Psychopathic Deviate) and 9 (Hypomania) were not significantly different. In every case in which the scales were different, the missionary candidate mean scale score was higher than the normative population mean scale score. Results indicated that the female missionary candidate sample was significantly different from the nonclinical normative population also on seven of the ten scales analyzed. Mean scores on Scales 4 (Psychopathic Deviate), 5 (Male/Female), and 6 (Paranoia) were not significantly different. In every case in which the scales were significantly different, the missionary candidate mean scale score was higher than the nonclinical normative mean scale score, except for scale 9 (Hypomania), which was significantly lower than the nonclinical normative sample mean scale score. The following sections will discuss implications for a normative profile for missionary candidates for the results of the clinical scales.

Scale 1

Compared to the other clinical scales, the differences from the normative population for Scale 1 (Hypochondriasis) yielded the largest effect size for both men and women (Cohen’s D=.646 and .543, respectively). High scores on Scale 1 are generally indicative of persistent somatic complaints and health-related concerns. The task of relocating to a foreign culture and engaging in religious work in potentially hostile
settings is often physically demanding work. Persons experiencing serious health problems would likely not self-select toward this line of work. Therefore, it is unlikely that higher mean Scale 1 scores for missionary candidates in this sample correlate with more health problems. If health problems were causing an inflated Scale 1 T score on a specific profile, then this would be an important consideration in determining the likelihood of success for a missionary candidate precisely because of the often physically demanding aspects of the job. High scores on Scale 1 can also be indicative of persons who have difficulty with oral expression, are demanding and critical of others, and prone to complaining. These are important interpretive considerations to be made in light of other data about the missionary candidate because these qualities are likely contraindicated for success in missionary work.

High scores on Scale 1 also can be suggestive of personality traits that trend toward narcissism, self-centeredness, and pessimism. While the missionary candidate mean T score does not rise to levels of clinical elevation, it is plausible that higher scores on Scale 1 may be accounted for by some of these personality traits. In excess, these Scale 1 personality traits can take the form of lack of empathy, lack of enthusiasm, and exaggerated self-concern. In moderation, these personality traits may take the form of independence and pragmatism, which are qualities that are valued in missionary work. Therefore, the results argue for caution in interpreting mild to moderate elevations on Scale 1. Results also argue for considering what potential positive or negative personality
factors may be loading on this scale that triggering elevations, and interpreting elevations on Scale 1 in the context of elevations on other scales.

**Scales 2 and 3**

High scores on Scale 2 (Depression) often indicate depression symptoms. High scorers on Scale 3 (Hysteria) often display decompensated functioning in stressful situations. In both cases, male and female missionary candidate mean T scores were higher than the respective normative population T scores ($t = 3.36$, $p < .001$, and $t = 3.39$, $p < .001$, respectively for Scale 2 and $t = 6.31$, $p < .001$, and $t = 6.69$, $p < .001$, respectively for Scale 3). In both cases, there are interpretive considerations for missionary candidate populations. The elevated mean T scores argue for caution in interpreting mild elevations on Scales 2 and 3. Moderate and higher elevations, as always, should be interpreted in the context of other elevated scales and known data about the missionary candidate, but will likely often suggest struggles that the missionary candidate is experiencing with depression and/or elevated responses to stress. Neither of these issues necessarily preclude a missionary candidate from being considered for service, but do merit consideration in the assessment process. In interpreting these scales for the missionary candidate assessment process, the candidate should be assessed for self-awareness around these concerns, coping strategies, available resources, history of successfully addressing symptoms, and willingness to access support. The candidate should have a clear understanding of problems suggested by elevations in these scales, a demonstrated history of effectively managing symptoms, and a clear plan for addressing these problems.
on the field, when resources are typically less available. Successful planning around these concerns would likely result in reducing attrition, and therefore candidates that are willing to engage in the planning process need not be excluded from service.

**Scale 4**

Scale 4 (Psychopathic Deviate) was developed to identify significant psychological disorders, including antisocial personality issues and a dysfunctional lack of morals. For both males and females in the missionary candidate sample, there were no differences from the normative population, and an interpretive framework for this scale does not change compared to the normative population. Results suggest that persons with extreme problems that are associated with elevations on this scale are unlikely to self-select for missionary work. Results also suggest that interpretive scrutiny for missionary candidates with elevated scores on this scale, particularly if other data corroborates concerns, is important insofar as antisocial personality issues and dysfunctional lack of morals would almost certainly have disastrous consequences on the missions field.

**Scale 5**

Scale 5 (Male/Female) is interpreted differently based on gender. For men, higher scores on Scale 5 indicate less stereotypical masculine interests. For women, higher scores generally indicate less stereotypical feminine interests. Results indicated that males in the missionary candidate sample endorsed more traditional gender expression than the females in the missionary candidate sample ($t = -7.45$, $p < .001$). Male missionary candidates tended to express less traditional gender expression than the male
MMPI-2 normative population (t = 5.82, p < .001). These results may be indicative of demographic patterns of persons that self-select as missionary candidates, but there is no “correct” form of gender roles for missionary work, and therefore, interpretive considerations for the assessment process should be limited. Considerations that may be important in the assessment process are extreme scale scores in either direction, whether the candidate’s gender role expression is a good fit with their potential sending organization, how gender role expression may be impacting their primary relationships, and how that gender role expression may impact their adjustment to the culture in which they will be serving.

**Scales 6, 7, and 8**

Elevated scores on Scales 6 (Paranoia), 7 (Psychasthenia), and 8 (Schizophrenia) generally correlate with more serious clinical syndromes. The mean T scores for male and female missionary candidates is higher for these three scales compared to the normative population, with the exception of Scale 6 for female missionary candidates, which showed no difference. Results argue for caution in interpreting mild elevations on these scales, particularly for Scales 7 and 8, which have K corrections loaded into them (see discussion above on interpretive considerations for the K scale and K corrections on p. 71-73). Elevations on these scales that suggest that the candidate is experiencing serious clinical symptoms associated with these scales indicate problems that highly correlate with attrition. Therefore, the capacity to further assess concerns that present on these scales is critical for a successful candidate assessment process.
**Scale 9**

Elevations on Scale 9 (Hypomania) typically identify elevated mood, excessive activity, and high energy levels. Extreme elevations may be suggestive of manic episodes. When Scale 9 is elevated, other problems indicated on the MMPI-2 profile may be acted out, and therefore elevations on this scale will likely suggest interpretive considerations for elevations on other scales. Results for Scale 9 for the present study are unique in that mean T scores for women were lower than the normative population ($t = -2.60, p< .001$). This was the only instance in which a sample mean T score was lower than the normative population. Extremely low scores on Scale 9 ($T< 35$) likely indicate depression. This interpretation would likely not be affected by the difference observed in this study. There were no differences for male missionary candidates compared to the normative population. Results suggest that interpretive considerations for missionary candidates do not change significantly from the normative population. Elevations on this scale may also be suggestive of missionary candidates that are outgoing, sociable, and excellent at first impressions. But high scorers also tend to have superficial relationships that often become distant and disconnected quite quickly. In other words, high scorers on this scale may, on the surface, present as the ideal missionary candidate in the assessment process, but in fact, may lack the internal resources to sustain a long-term missionary venture. High scorers on the Hypomania scale should be evaluated carefully for their attrition risk by further assessing the quality of primary relationships.
Scale 0

Scale 0 (Social Introversion) is unique in that high scores as well as low scores can be interpreted. High scores tend to correlate with personalities that are shy, quiet, and even timid, and low scores tend to correlate with personalities that are gregarious, sociable, and extroverted. The mean T scores for both male and female missionary candidates is higher than the mean T score for the normative population (t = 3.79, p<.001, and t = 4.69, p<.001, respectively). Results of the present study are counter-intuitive in that missionary work is traditionally socially-oriented work and a common stereotype of missionaries is of an independent, but sociable personality. Results may suggest that the stereotypes about missionaries and missionary work may not be accurate. Results may also suggest that other factors that are more salient for missionary candidates that load on Scale 0 may be inflating the mean T score for missionary candidates, including qualities like seriousness, reliability, and a tendency to be self-effacing. Results again suggest caution in interpreting mild elevations on this scale, and may also suggest caution in pathologizing interpretations for mild to moderate elevations.

Summary of Discussion of Comparing the Sample to the MMPI-2 Normative Population

In summary, results of comparing the mean T scores of missionary candidates to the normative population suggest a general posture of caution in interpreting mild elevations. They also suggest an approach to interpreting the F, L, and K validity scales in the context of the pattern as well as the individual T score values. Higher scores on the
K scale can be interpreted to suggest that candidates may perceive a double-bind on some questions that put them in a defensive posture regarding the assessment as a whole. A final implication of the results is that the most effective interpretive framework for the assessment process is one that examines each scale individually compared to the normative profile for missionary candidates, in the context of the candidate’s overall MMPI-2 profile, and in the context of other known data about the candidate with the goal of planning for success for the purpose of reducing attrition.

**Discussion of Trends Over Time for the Missionary Candidate Sample**

The data were analyzed for trends across time for missionary candidates on the F, L, and K validity scales and the 10 clinical scales. See Chapter 4, Tables 8 and 9, p. 55-57 for summary tables with complete data on these analyses. Results indicated that there were no differences across time, with one exception. The mean score for the K scale for candidates tested between 1992 and 2002 was significantly higher than candidates tested between 2003 and 2006 and candidates tested between 2007 and 2010 ($F(2,374) = 3.13$, $p=.045$, partial eta squared = .016). In other words, candidates who were assessed between 1992 and 2002 presented as less defended on the MMPI-2 than missionary candidates who were assessed between 1992 and 2002. Results indicating no difference in overall levels of pathology but less defensiveness in the assessment process may reflect that missionary candidates are less defended on the MMPI-2 because they are becoming increasingly likely to see psychological assessment as legitimate and helpful in determining their readiness for missionary work. They may also be less likely to see
psychological assessment as an unnecessary or even “unbiblical” step in the missionary
candidate process, or a potential obstacle in their path to becoming missionaries. If true,
this would represent a positive trend for the candidate assessment process in that
candidates who believe in the psychological assessment are more likely to invest in the
process and would therefore be more likely to benefit from the feedback generated.

**Discussion of Trends by Date of Birth for the Missionary Candidate Sample**

The data were analyzed by date of birth, grouped by generational affiliation, for
missionary candidates on the F, L, and K validity scales and the 10 clinical scales. See
Chapter 4, Tables 10 and 11, p. 60-62 for summary tables with complete data on these
analyses. Results indicated that there were no differences across time, with two
exceptions. The mean scale score on the K scale for Generation Y missionary candidates
was significantly lower than Baby Boomer candidates and Generation X candidates
\( F(2,372)= 9.74, p<.001, \) partial eta squared = .050). Results also indicated that the mean
scale score on Scale 1 (Hypochondriasis) for Baby Boomer missionary candidates was
significantly higher than Generation Y candidates \( F(2,372) = 5.01, p=.007, \) partial eta
squared = .026). Results for Scale 1 may simply be reflective of Baby Boomer candidates
being older (mean age= 50.08) at the time of testing than Generation Y candidates (mean
age= 23.57), and therefore having more physical complaints to endorse. The mean age of
Generation X candidates at the time of testing (M= 30.08) is closer to the age of the
Generation Y candidates than Boomer candidates. The lack of difference between
Generation X and Generation Y candidates on Scale 1 supports the conclusion that the
age difference accounts for the generational differences on this scale. The results for the differences on the K scale by generation may be more reflective of generational differences that have implications for the assessment process.

Generation Y candidates did not show any difference in levels of pathology compared to Generation X and Baby Boomer candidates, but did present as less defensive in their test-taking posture. Generation Y candidates grew up in an era of increasing access to technology and social networking. The “Facebook Generation” may be more used to having their private thoughts and problems posted in public forums in ways that may result in less defensiveness in the missionary candidate assessment process. Another possible explanation is that Generation Y candidates grew up in a cultural context that had more access to and was more accepting of psychological services than previous generations. Generation Y candidates may see psychological assessment as less in conflict with their religious orientation and more likely to be helpful than their generational counterparts, which may result in a less defensive posture in the assessment process. If this is a valid interpretation of the data, one implication is that younger generations of missionaries may get more accurate feedback from the assessment process and therefore would be in a better position to plan for success. Another implication is that younger missionaries may be more open, not just to psychological assessment at the onset of their candidacy, but to psychological services as a valuable part of their entire missionary experience. Sending organizations may find that costs of increasing access to psychological services would be more than offset by the reduction in psychological
problems that require costly intervention and the reduction in attrition that identifying and addressing problems in real-time might afford. Moreover, younger missionaries’ increased comfort with technology may facilitate access to psychological services, even in the most remote parts of the planet as technology evolves to find new ways to deliver psychological services. In short, the younger missionary candidate may be a more willing consumer of psychological services at a time when access to those services is becoming more cost-effective to provide in the field.

The results may also suggest a counter-narrative to a traditional Evangelical belief about culture in general and younger Evangelicals in particular. An important narrative in the Evangelical culture is the deterioration of American society, particularly since secularization has increased since the 1950’s (Wright, 2010). Results of the current study do not indicate any increase in pathology across time or by generation and instead may indicate trends towards less defensiveness. The younger generation may be more equipped to catch the baton of missionary work from preceding generations than older Evangelicals may be aware. In terms of implications of developing a normative profile for missionary candidates on the MMPI-2, there appear to be trends over time and by date of birth towards less defensiveness on the MMPI-2 and possibly more acceptance towards psychological assessment and psychological services.

**Discussion of Comparison of Results with Literature**

This section discusses results compared to other studies that have specifically looked at MMPI results for missionaries. Comparisons are limited due to the small body
of research regarding mental health issues for missionaries in general and missionary candidates in particular. Three areas of the research literature are relevant for comparative purposes to the present study. Research regarding factors that predict missionary attrition, research regarding the MMPI and candidate assessment in high attrition settings, and research regarding the MMPI and missionary candidate assessment are discussed.

**MMPI and Candidate Assessment in High Attrition Settings Literature**

Sellbom, Fischler, and Ben-Porath (2007) studied the predictive validity of the MMPI-2 in identifying behavioral misconduct in police officers. One interesting result in the context of the present study is that applying the K correction, which corrects for a defensive test-taking posture, was less effective in predicting behavioral misconduct for police officers than not applying the K correction. The normative profile for missionary candidates includes an elevated K scale compared to the nonclinical normative sample. It is not known if the K correction is predictive of missionary candidate attrition for the sample population in the present study. However, the results of the police officer study agree in general with the results of the present study in suggesting that interpreting a high K score should be done with caution, and that it may be more appropriate to interpret the clinical scales of some missionary candidates without the K correction if a defensive posture is not showing up in other aspects of the assessment process. A study of Air Force cadets (Lachar, 1974) found that the K scale tended to be lower than the sample
mean for cadets who experienced significant adjustment problems, which also suggests a cautious approach to interpreting high K scale scores for missionary candidates.

On the other hand, Schubert and Gantner (1996) found that an elevated K scale (K > 65) was the third most significant predictor of missionary attrition. The two predictors that were more accurate were: any two scales (except 5) > 65, and any 2 subscales (except Ego Strength) > 65. Perhaps an appropriate way to reconcile conflicting data on the K scale in light of the results of the present study is that a higher (but not clinically elevated) K score is considered normative for missionary candidates, that mildly elevated K scores should be interpreted with caution, and a moderate to highly elevated K scale may have interpretive value, but only if other aspects of the assessment process suggest a defensive posture.

Langston (1970) studied MMPI results as a predictor of attrition for nuns in a convent setting. Results indicated that those who left the convent had higher original MMPI scores on the 4 (Psychopathic Deviate), 8 (Schizophrenia), and 9 (Mania) scales and lower scores on the L and 0 (Social Introversion) scales than nuns who remained in the convent. As this was obviously a study of females, the best comparison to the present study is to female missionary candidates. There are clearly issues that complicate comparing nuns and female missionary candidates that suggest caution as the best approach. The most obvious inconsistency is that 53.6% of the female candidates in the sample population are married, while nuns are forbidden to marry. Also, the present study was not investigating predictive factors, but was instead focused on the feasibility of
establishing a normative profile. A small sample size for the nun study (n= 22) also suggests caution in making comparisons. However, both populations chose a vocational option that involved a major life-altering shift for religious reasons, and therefore some consideration of comparisons is appropriate.

Female missionary candidates scored significantly higher than the nonclinical normative sample on the F, L, and K validity scales and Scales 1, 2, 3, 7, 8, and 0. They scored lower on the 9 scale. There was no difference on scales 4, 5, and 6. The lack of significance in either study regarding the 5 scale suggests that adherence to gender-stereotyped or non-gender-stereotyped behavior does not appear to be a factor in success or failure for women in these particular religious vocations. This may be an empowering interpretation for women who do not feel they are qualified for missions work because they don’t fit the stereotype on one end of the spectrum (“I’m not rugged enough to live in another country”), or the other (“I’m not submissive and soft-spoken enough to do Christian ministry”). There appears to be room for a variety of gender role expressions for women in successful missionary work.

Results also suggest that antisocial and psychosis issues, which may be suggested by high 4 and 8 scale scores, likely contraindicate successful ministry service. A lower 9 scale for female missionary candidates and a higher 9 scale for unsuccessful nuns suggests that an elevated 9 scale, which was developed to identify characteristics of hypomania, may have predictive validity for female missionary candidates. Results of the
Langston study indicate that further analysis of MMPI profiles of married and single missionary candidates may provide clinical utility.

**MMPI and Missionary Candidate Assessment Literature**

This section discusses the results of the study in comparison to four studies that have specifically researched the MMPI in relation to missionaries and missionary candidates. Dillon (1983), using similar methods to the present study, compared mean T scores of 22 scales of the MMPI-1 profiles of 827 evangelical missionaries with nonclinical normative samples using t-tests. There were both similarities and differences in the results of Dillon’s study compared to the present study. While Dillon’s study examined MMPI-1 results and the present study examined MMPI-2 results, this should not have a confounding effect on making comparisons between results (Schubert & Gantner, 1996). Dillon found that missionaries scored somewhat higher than the nonclinical normative sample on the L, K, Hy, and Mf scales. Results of the present study found that both male and female missionary candidates also scored higher than the nonclinical normative sample on the L, K, and Hy scales. Male missionary candidates scored higher than the nonclinical sample on the Mf scale, but female missionaries did not. The difference in the Mf results for women may suggest a shift in women’s self-perception from the time the data were collected prior to 1983 to the data collected for the present study, which is predominantly between 2000 and 2010. The present study did not find differences across time on the Mf scale between the years 1992 and 2010, which would have supported this hypothesis. However, a small sample size from the decade of
the 90’s (n=10) may have contributed to an inability to detect differences across time on this scale.

Non-perseverers in the Dillon study tended to show more depression and thought disturbances. While depression should not be considered a disqualifier for missionary service, it does highlight the need to identify problems with depression and develop a plan for managing symptoms on the field. Thought disturbances may indeed preclude selection for missionary service depending on the degree to which daily functioning is affected. Further psychological assessment may be necessary if thought disturbance symptoms are identified in an MMPI profile. That perseverers tended to worry more is an interesting result that further suggests that indicators of psychological maladjustment should not be interpreted as disqualifiers, but instead should be interpreted as factors to be viewed in light of the candidate’s overall resiliency and openness to feedback. That perseverers tended to worry more also validates the development of a normative profile for missionary candidates by highlighting the unique interpretive framework required for missionary candidates. An approach that attempts to identify traits that are adaptive for missionary service, rather than one that merely attempts to identify psychopathology patterns, is the best suited for this assessment context. In terms of validity scales, elevated F and L scales were predictive of non-persevering missionaries, but not the K scale. This should serve to reinforce discussions in other sections of this chapter, which argue for caution in interpreting elevated K scores in missionary candidates.
Dillon also found that missionaries scored lower on the F, Hs, D, Pd, Pt scales. Results of the present study indicate that missionary candidates, in contrast, scored higher on these same scales compared to the nonclinical normative sample. While the differences in the scores are statistically observable, they are not clinically relevant. The difference may be attributable to Dillon’s sample being missionaries instead of missionary candidates, in that their lower scores are reflective of candidates who were psychologically well-adjusted enough to complete the candidacy process, while the present study includes candidates who were not able to successfully complete the process. It is also possible that the smaller sample size for the present study (n= 377 compared to n= 827) provided less ability to detect subtle differences. Differences between the original MMPI, which was used in the Dillon study, and the MMPI-2, which was used in the present study, may also make comparisons between the two studies difficult. Additional research on missionaries and missionary candidates using the MMPI would provide additional information in resolving these discrepancies and further promote an effective candidate assessment process.

Adams and Clopton (1990) measured Denial scale scores (a scale derived from items on the Hy scale) of missionaries and found that missionaries with lower Denial scores were correlated with negative outcomes and higher scores were positively correlated with feelings of satisfaction regarding their work and their sending organization. Results are interpreted by the authors such that a healthy level of denial can be helpful in adapting to the difficult demands of a missions position. Results from the
present study indicated that missionary candidates have significantly higher Hy scale scores than the nonclinical normative sample. The difference is not clinically relevant, but does suggest that checking the Denial scale as well as critical items that load on the Hy scale may be important in correctly interpreting that scale for missionary candidates. A high Hy score that does not have a corresponding high Denial score may be of more clinical concern than a high Hy score that does have a corresponding high Denial score.

Sprinkle (1989) studied 146 Southern Baptist missionaries by comparing MMPI scores of husbands and wives. Results indicated that average scores of husbands and wives were very similar. There was no difference in MMPI scores of persevering and non-persevering husbands, and very small differences in MMPI scores of persevering and non-persevering wives. These results indicate that married couples tend to have similar MMPI profiles and therefore divergent profiles among spouses may be of increased clinical concern. However, this remains a hypothesis, and a follow-up study using the sample population to analyze correlations between marital dyads may be helpful in further establishing a normative profile for missionary candidates insofar as understanding correlations between marital dyads may increase interpretive validity when profiles differ significantly between spouses.

In a final study for discussing the results in the context of the existing literature on missionaries and MMPI scores, Kyne (1992) failed to find the predicted correlation between MMPI scores that indicated interpersonal difficulties and poor field performance in a sample of missionaries. However, results indicated that there were significant results
related to gender. Persevering men scored significantly higher on scales 6 (Paranoia). The present study found significantly higher scores for men on scale 6 compared to the nonclinical normative sample. The difference in both cases was statistically observable but not clinically relevant. Kyne’s study appears to agree with the results of the present study in arguing for caution in interpreting mild elevations on scale 6 for men. Another interesting result in Kyne’s study was that persevering women scored significantly lower on scale 4 (Psychopathic Deviate) than non-persevering women. The present study found no significant difference for women in this study compared to women in the nonclinical normative sample on Scale 4. Kyne’s study reinforces interpretation of the data of this study that indicate that clinical syndromes that may be suggested by clinically elevated scores on Scale 4 correlate with attrition for missionaries and should be carefully considered in light of other data about the candidate.

Schubert and Gantner (1996) found the MMPI-2 to be a valid tool if interpreted correctly. Looking only at MMPI-2 profiles, they attempted to predict which missionaries had successfully completed their term. Results indicated that “Yes” predictions were accurate 77% of the time, “No” predictions were 71% accurate, and “Maybe” predictions were divided between 58% successes and 42% failures. These results seem to indicate that the MMPI alone is not sufficient as an evaluation tool in candidate selection for missionaries, but it can be an informative part of the assessment process when other assessment results and a clinical interview are included in the process. Developing a
normative profile for missionary candidates is likely to increase interpretive validity and therefore predictive validity.

Schubert and Gantner also found missionaries in their sample between the ages of 19-30 to be the most successful in completing their term, and missionaries between the ages of 30-39 to be the least successful. They hypothesized that family obligations negatively affected missionary effectiveness, with the youngest candidates being least encumbered by family obligations and freer to focus on the missionary endeavor. Missionaries in their 30s would be more likely to be married and starting a family, and possibly in the beginning stages of caring for aging parents, which would increase stress levels and non-vocational obligations. The mean age for the missionary candidate sample was 33.12 (SD= 7.94), indicating that the sample tended to be in the age group that may struggle most to successfully complete their term. If a candidate has children, assessing the whole family in the candidate assessment process may be a key factor in reducing attrition. Also, discussing extended family roles, obligations, expectations, and plans are a vital process in the clinical interview of the assessment process. Assessing children and the quality of family interactions, and understanding extended family processes would provide important context by which to more accurately interpret MMPI-2 profiles.

**Summary of Discussion Comparing Results with the Literature**

The existing literature argues for a unique interpretive framework for MMPI profiles of missionaries and missionary candidates, and the present study supports this conclusion. Results found significant differences on twenty of the twenty-six scales
analyzed. Even if no significant differences were found, the argument for a unique interpretive framework is that the purpose of the missionary candidate assessment process is to reduce attrition by identifying concerns and assessing for resiliency. The presence of significant differences between the sample and nonclinical normative sample found in the present study bolsters the argument for a unique interpretive framework. The existing literature on the MMPI and missionary populations supports this conclusion. Additional research is needed to further understand how the candidate assessment process can be more effective.

The results of the present study, which argue for caution in interpreting the K scale, are echoed in the existing literature on the missionary candidate assessment process. This is not to argue that the K scale scores should be disregarded, but that the results of the present study add to the discussion in the existing literature in underscoring the importance of considering context for the K scale.

**Study Limitations**

**Sampling Limitations**

There is a lack of research on missionaries and missionary candidates. This may be due in part to a lack of emphasis on research in the missionary community. This may also be due in part to difficulties in collecting data. Member care is a relatively new priority in the missions community (Brierley, 1997). It is still uncommon for sending organizations to require missionary candidates to undergo formal psychological
assessment, and there are only two national organizations this author is aware of that offer psychological assessment for missionary candidates as part of their services. MCS is one of those organizations and therefore their archival data (and signed research consent forms) represent a rich source for much needed research. However, there are also sampling limitations related to using this data set for developing a normative profile for missionary candidates. Limitations include sampling limitations, data collection limitations, diversity limitations, and conceptual limitations. Each limitation will be discussed.

**Representative Sample Limitations**

It is unclear what bias may be introduced to the sample population by a lack of a truly representative sample. Using archival data at MCS has merit for studying the research questions posed by this study. Candidates were referred from a geographically and ecumenically diverse group of sending organizations. However, it is a self-selecting process, insofar as any sending organization voluntarily sends its candidates to MCS for assessment if they perceive the value to outweigh the cost. Some missionary organizations choose not to do any psychological assessment, while other organizations choose to hire a person within the organization to do the assessment. Other organizations may have investigated MCS and found a better fit for their assessment needs. In addition, MCS is an explicitly Evangelical organization. MCS does not serve exclusively Evangelical organizations, but Evangelical sending organizations are probably more likely to send candidates to MCS. It is not possible to know if the missionary candidates
referred to MCS are representative of missionary candidates as a whole. Also, there is nothing in the research literature that addresses this issue in a way that provides additional information.

Therefore, this study can best be utilized as an introductory attempt to establish a normative profile for missionary candidates on the MMPI-2. Future research can seek to add to the literature by including missionary candidates who were assessed in other settings and over longer periods of time. Future studies can add to the establishment of a normative profile by including a broader representative sample.

Data Collection Limitations

An unexpected issue became a problem during data collection. Research consent forms were not offered to candidates until 2000, not 1990, the year MCS began doing missionary candidate assessment, as this author had thought at the time the study was proposed. Approximately half of the files in the MCS archives could not be used because of the lack of a signed research consent form and the difficulty in following-up with these candidates (which is discussed below). This had a negative effect on the sample size and may have affected the ability to detect trends over time. Also, demographic data were extracted from archival files, and therefore demographic data were limited to information that had already been collected, which limited design possibilities.

Follow-up Limitations

A further limitation of this study is the lack of access to the candidates in the sample population. All participants voluntarily signed research consent forms for their
data to be used anonymously for research purposes. All the candidates in the sample population also signed a release of information form for the report that summarizes their assessment results to be sent directly to their sending organization (the candidates were also sent a copy of the report). Most of the candidates then had no further contact with MCS. Therefore, little is known about the candidates after their assessment, and finding additional information is problematic.

There are several issues that make following-up with the sample population prohibitive. First, missionary organizations are understandably reticent to release information about their missionaries. There are legal and ethical issues involved with releasing information about the performance of their employees. Missionaries may be in countries that are considered “sensitive,” meaning there may be safety risks if those persons were publicly identified as missionaries. Sending organization may also be unwilling to release that information for research purposes, regardless of assurances of confidentiality and anonymity. A practical issue is that the candidates in the sample population are literally spread around the world, and some missionaries may occasionally or substantially be without reliable means of communication. Finally, many of the candidates assessed are likely no longer with the organization in which they were candidates when they were assessed. This could be true for many different reasons and therefore it would be difficult to interpret the findings without cumbersome tracking. Some candidates may not have been hired based on problems related to their psychological assessment results. Others may not have been hired, not because they were
not psychologically healthy, but because of doctrinal differences, personal reasons, or simply that a better opportunity developed elsewhere. Other candidates may have been hired and have already successfully completed the term they were hired for. Others may have been hired and did not complete their term, for either positive or negative reasons. In summary, it is not possible to reasonably speculate on how candidates fared after they were assessed, and it would be difficult for a variety of reasons to find the candidates now to find out whether they were hired and to assess their performance on the field.

The difficulties of trying to further assess the missionary candidates in the sample population has only minor implications for the purpose of the present study, but present greater challenges for any future studies using this sample. For the present study, the most important implication is that there are limitations on how the data can be interpreted. We do not know if the sample includes successful or unsuccessful missionaries, missionaries who were hired or not hired, or missionaries whose struggles reflect or do not reflect their results on the MMPI-2. The only interpretations that can be made from the sample population is that the normative profile established in this study is normative only for missionaries in the candidacy process.

For future studies, there are implications for the reality that it would be difficult, and in some cases impossible, to further assess the sample population. Longitudinal studies in which participants are measured again and comparison studies in which participants’ MMPI-2 results are compared for those who persevere and those who do not
persevere would have important clinical utility. However, one of the limitations of this study is that there are important obstacles to follow-up research.

**Diversity Limitations**

MCS collects data on nationality, but does not collect data regarding race or ethnicity. Every participant in the study was a United States citizen, but there was no way to ascertain how many persons in the study were representative of marginalized populations, and therefore, there are two diversity limitations inherent to the sample for this study. The first is the issue of homogeneity; the second is the issue of marginalized status.

In regard to the issue of homogeneity, MCS staff estimated that over 90% of the persons assessed at MCS are European-American. One problem is that this is only an estimate. Another problem is that there is no way of knowing the racial or ethnic identities of those assessed who were not European-American. A final difficulty is that there is no information available in the literature as to the racial or ethnic breakdown of missionaries in the field. The sum result of these limitations is that there is no way of knowing whether the ethnicity of the sample in this study is reflective of the ethnicity of the missionary population as a whole, which may limit generalizability.

The second diversity limitation is that there is no way of knowing how issues related to diversity may be impacting the establishing of a normative profile because there is no reliable way to analyze that information in the data. The MMPI does not appear to pathologize minority populations (Hall, Nagayama, and Lopez, 1999). There is
no information in the literature on how MMPI-2 results are influenced by any issues related to diversity for missionary candidates. One suggestion for future research is to ascertain a clearer understanding of demographic variables for missionary candidates to begin to understand how diversity issues may be contributing to success or attrition for missionary candidates.

**Conceptual Limitations**

The purpose of the present study was to determine whether a normative profile on the MMPI-2 for missionary candidates was warranted based on the MCS data, and, if so, to establish such a profile for the purpose of reducing attrition. Conceptually, attrition can be hard to define. Just because a missionary completes the term they have agreed to fulfill does not mean they have succeeded. Likewise, just because a missionary has not completed their agreed upon term does not mean they have not succeeded. The MMPI-2 has been shown to be a valid tool for psychological assessment that can have direct benefit for the missionary community by identifying unsuitable candidates as well as treatable psychological issues. But not all attrition can be directly linked to data generated on an MMPI-2 profile, and therefore, one limitation of this study is that the results can only account for a part of the candidate assessment process and may not be able to account for attrition, preventable or otherwise.

Another conceptual limitation of this study is the indirect relationship between MMPI-2 results and attrition. If a missionary does not succeed on the field, there is no direct causal link between any issues indicated on their MMPI profile. There is a gap
between what any psychological assessment can measure and how a person will respond to the unique, stressful, and unpredictable experiences of living in a foreign culture doing vocational religious work. Therefore, the present study is not directly involved in reducing missionary attrition, but should be understood in the context of having validity for the candidate assessment process in supporting success and reducing attrition.

**Summary of Study Limitations**

The limitations of this study include the problems with using archival data for the sample, questions as to whether this constitutes a representative sample for missionary candidates, difficulty in generating follow-up data on the sample, lack of information about diversity, and conceptual limitations regarding the role of the MMPI-2 in reducing attrition.

**Clinical Implications: Recommendations for Future Research**

The findings in this study suggest that the missionary candidate population is a unique group, and the development of a normative profile appears to fill a gap in both research and practice. However, there is a general lack of research on missionaries and missionary candidates, and therefore, additional research would be required to more fully understand how the results of this study apply to promoting missionary effectiveness and reducing attrition.

An interesting demographic finding of this study is that the majority of the single missionary candidates were women (77.6%). It is unclear whether this is representative of the missionary community in general and what implications this might have for the
candidate assessment process and the broader missionary community. Follow-up studies that seek to confirm whether women (and particularly single women) make up the majority of missionaries and what implications this may have for reducing attrition may have significant utility. The data set for this study could be analyzed for differences between married and single women, single men and single women, and trends over time without having to collect any additional data. It is also unclear in the research literature what factors may predict success or attrition for single women missionaries, which would be important information if demographics from the sample are representative of the missionary population. Follow-up studies that attempt to understand the experience of single women missionaries by identifying attrition rates, qualitatively describing their experience on the field, and analyzing data for correlations between attrition, success, and candidate assessment variables, particularly MMPI profiles, may have significant benefit for an effective candidate assessment process.

There are no studies to date that have looked at the impact of assessing the children of missionary candidates or of assessing family dynamics of candidates with children. Historically in the missionary candidate assessment process, only parents have been formally assessed. But the notion that the adjustment of children is equally vital and deeply connected to the adjustment of the parents certainly has face validity. MCS began requiring in 2009 that the children of candidates also be part of the assessment process, with assessment protocol varying on the ages of the children. It is unclear if other missionary candidate assessment organizations or sending organizations that do their own
assessments are also making this standard practice. Further research in this area may support the importance of assessing the whole family in the candidacy process and provide data for what methodologies are effective.

Data were not collected for whether candidates had children at the time of their assessment that would be joining them overseas, but that data is available in the MCS archival files and may be interesting data to analyze for follow-up study. It may enhance the candidate selection process to understand how parents may differ on MMPI-2 profiles from married partners that do not have children, and to analyze correlations between MMPI-2 profiles of married partners with and without children. Follow-up studies that would seek to compare attrition rates of missionaries with children with other populations and analyze MMPI results of missionaries with children to look for predictive factors would provide important information for the candidate assessment process. Also, studies that compare attrition rates of candidates that were assessed as a family to candidates in which the children were not assessed would provide data as to whether this is an effective practice.

This study found that candidates that were assessed more recently (and tended to be younger) had lower K scale scores and no significant difference in pathology on the Clinical Scales. Results also indicated that Generation Y candidates had lower K scale scores and no significant difference in pathology on the Clinical Scales. These results may suggest that younger missionaries have a different and more favorable view of psychological services. If younger missionaries are more comfortable with psychological
services, and in fact expect more access to psychological services while on the field, then sending organizations would do well to assess the level of services they make available as a tool for recruiting and retaining younger missionaries. Follow-up studies that examine this hypothesis may have significant implications for understanding trends in the missionary community, identifying needs, and allocating resources.

The newest format of the MMPI is the Minnesota Multiphasic Personality Inventory Restructured Format (MMPI-RF). It utilized the Restructured Clinical Scales (RC Scales), as opposed to the Clinical Scales. The MMPI-RF is becoming the standard MMPI assessment tool and there is some evidence for increased clinical utility compared to the MMPI-2. In 2003, the RC scales were introduced, including a general distress scale (Demoralization) and nine clinical scales (Tellegen, Ben-Porath, McNulty, Arbisi, Graham, & Kaemmer, 2003). The original MMPI Clinical Scales have a great deal of heterogeneity and therefore, high intercorrelations (Tellegen, Ben-Porath, McNulty, Arbisi, Graham, & Kaemmer, 2003; Simms, Casillas, Clark, Watson, & Doebbeling, 2005; Graham, 2006). The RC scales were designed to respond to this critique by addressing item overlap and increasing discriminant validity (Sellbom & Ben-Porath, 2005). By separating out broad emotional distress, the RC scales increase interpretive clarity (Graham, 2006). The RC scales demonstrate internal consistency and test-retest reliability, as well as increased intercorrelation validity compared to the original clinical scales (Graham, 2006). They also demonstrate construct validity and superior convergent and discriminant validity to the original scales (Sellbom & Ben-Porath, 2005). The RC
scales appear to yield strong clinical utility in clarifying complex MMPI-2 profiles in ways that allowed for clients to feel heard and understood (Finn & Kamphuis, 2006). The RC scales are also less susceptible to under- and over-reporting than Clinical scales (Sellbom, Ben-Porath, Graham, Arbisi, & Bagby, 2005).

Sellbom, Fischler, and Ben-Porath (2007) studied the predictive validity of the MMPI-2 in identifying behavioral misconduct in police officers, another high stress, high attrition field. Data from 291 male police officers who were given the MMPI-2 as part of their pre-hire administration were analyzed. Officers who experienced some kind of negative outcome, such as receiving complaints from civilians (n= 87) were compared to officers who had not (n= 204). Results indicated that use of the K-corrected scales was counterproductive, which supports other research, including this study, that questions the appropriateness of using the K-corrected scales in non-clinical population. Results also indicate that several RC scales (RC3, RC4, RC6, and RC8) were meaningful and were associated with problematic behaviors. Overall the RC scales showed more predictive validity than the Clinical scales.

The results of the preliminary research on the RC scales indicate that it will be important to research these scales for missionary candidates. Follow-up studies that establish a normative profile for missionary candidates on the MMPI-RF would have significant utility for the candidate assessment process if the MMPI-RF becomes the standard assessment tool that is used. The Clinical Scales from the MMPI-2 profiles from the data set for this study could be converted to generate RC Scale scores. Follow-
up studies that attempt to establish the predictive validity of the RC Scales for missionaries may also help establish whether a move from the MMPI-2 to the MMPI-RF would be efficacious for the candidate assessment process.

**Chapter Summary**

The establishment of a normative profile for missionary candidates on the MMPI-2 consisted of establishing mean scale scores for three validity scales and the ten clinical scales. None of the mean scale scores were clinically elevated. Compared to the nonclinical normative population assessed for employment purposes, ten of the thirteen scales were significantly different for both men and women. In every case where there were differences, the missionary candidate sample had higher mean scale scores than the normative population, with the exception of Scale 9 (Hypomania) for women. These results have some relevance for interpreting the MMPI-2 results of missionary candidates and for the missionary candidate process in general.

Results suggest a general posture of caution in interpreting mild elevations on both validity and clinical scales. They also suggest an approach to interpreting the F, L, and K validity scales in the context of the pattern as well as the individual T score values. The highest mean scale score and the largest effect size compared to the normative population was the K scale, which generally measures subtle defensiveness. Missionary candidate scores on the K scale suggest that candidates may feel defensive regarding the assessment as a whole compared to the mean scores for persons taking the assessment for employment purposes, possibly because of concerns that the assessment might
pathologize their religious orientation, and therefore, elevated K scores should be interpreted with caution.

Results suggest an overall interpretive framework that examines each MMPI-2 scale individually compared to the normative profile for missionary candidates, in the context of the candidate’s overall MMPI-2 profile, and in the context of other known data about the candidate. Mild elevations on any scale should be interpreted with caution, particularly when the mean scale score for the normative profile for missionary candidates is higher than the normative population score. Profiles should be interpreted in the unique context of identifying factors that predict attrition for missionaries and facilitating the process of planning for success for high stress vocational religious work in cross-cultural settings.

This study found some differences on profiles across time and by date of birth, as defined by generational affiliation. Differences may have been difficult to detect over time and results should be interpreted with caution because of the relatively short time frame over which data were collected. Results indicated that there were no differences across time, with one exception. The mean score for the K scale for candidates tested between 1992 and 2002 was significantly higher than candidates tested between 2003 and 2006 and candidates tested between 2007 and 2010. Results also indicated that there were no differences across time, with two exceptions. The mean scale score on the K scale for Generation Y missionary candidates was significantly lower than Baby Boomer candidates and Generation X candidates. Results also indicated that the mean scale score
on Scale 1 (Hypochondriasis) for Baby Boomer missionary candidates was significantly higher than Generation Y candidates. Results for Scale 1 may simply indicate that Baby Boomer candidates were older at the time of testing than Generation Y candidates, and therefore had more physical complaints to endorse. Taken together, these results suggest that younger missionaries do not exhibit differences in levels of pathology, but may be more open to psychological assessment as part of the candidacy and more open to psychological services as part of their on-field experience.

The goal of using the MMPI-2 is not necessarily to screen out candidates who want to serve, although some profiles would strongly suggest this as an option. The goal of using the MMPI-2 is to help the candidate and the sending organization identify problems that might be exacerbated by the stressors of cross-cultural missionary work and develop a plan to mitigate those concerns. Overall, the MMPI-2 is an effective tool in the missionary candidate assessment process, and the results of the present study increase interpretive validity for this tool in service of the goals of the candidate assessment process. The results of the study may also suggest that it would be wise for sending organizations to facilitate greater access to psychological services for the on-field missionaries, particularly younger missionaries.

**Conclusion**

Psychological health of missionaries is essential to successful service. Many of the factors associated with preventable attrition can be identified by a strong candidate assessment process. The MMPI-2 has been shown to be an effective part of this process.
While comparing profiles of missionary candidates to the nonclinical normative population has demonstrated utility, it can also be problematic in that missionary candidates are a unique population. The results of this study support the premise that this is a unique population, as evidenced by 20 of the 26 mean scale scores of candidates being different than the respective normative population mean scale scores. A normative profile therefore offers a more effective point of comparison for the MMPI-2 results of missionary candidates.

Not only is the missionary candidate population unique, but the goals of the candidate assessment process are unique. Attrition can be reduced by identifying some candidates as psychological unfit for missionary service. Severe psychosis and ego-syntonic anti-social characteristics are examples of issues that would likely rule a person out for successful missionary service. But more importantly, the goal of the candidate assessment process is to help a candidate identify issues that may be exacerbated by on-field conditions. Missionary work is often stressful and physically demanding. It is not uncommon for a missionary to experience significant traumatic stressors while on the field. Missionary work is also typically done in an environment where the person has fewer resources—socially, psychologically, and financially—than they would in their home culture. What may have been a manageable concern for the candidate “at home” may become a highly distressing problem in this more intense, less supportive environment. The establishment of a normative profile for missionaries can facilitate this process of identifying concerns and planning for success by providing a more accurate
point of comparison, and a point of comparison that is less likely to discriminate against their religious orientation because the point of comparison is their peers. This more accurate point of comparison can help create a validating environment in which the candidate feels more safe to plan for their success rather than defensive that identified problems may preclude them being chosen to serve.

One aspect of planning for success that is suggested by the result of this study is that younger candidates may be more open to psychological services than their older counterparts. Emerging technologies, globalization, and increased ease of travel offer increasing opportunities to provide missionaries with access to psychological services on the field. Younger missionaries may be more comfortable with psychological services as part of their plan to address psychological problems and promote resiliency. They are also likely to be comfortable with technologies that can deliver these services, meaning that sending organizations can proactively prepare for accommodating the needs of missionaries, reducing attrition, and promoting success by reassessing their approach to psychological services. This study can enhance the psychological assessment of candidates, but may also have implications that extend beyond candidate assessment into every aspect of field service and re-entry when service is done.
References


http://dictionary.reference.com/browse/evangelical


http://dictionary.reference.com/browse/missionary


Appendix A
Supplementary Table: Pairwise Comparison of Mean Clinical Scale Scores
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<th>Scale Comparison</th>
<th>Mean Difference</th>
<th>Std. Error</th>
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Appendix B
Missionary Care Services Research Consent Form
MCS Research Consent

MCS is committed to assisting missionaries obtain the support, help, and encouragement that they need. Part of this vision is to conduct meaningful research, reviewing our files, and learning all we can from our experience in counseling missionaries.

We would like your permission to use your information in conducting a research project. All of the strictest standards of confidentiality will be maintained. While specific data may be used from your file, including but not limited to demographic information, test results, and a summary of relevant therapy issues, your name and/or any identifying information will not be used. If findings from these studies are ever published, presented, or written about, it will be in the context of group data not individual missionaries. There will be no personal identifiers used, but rather data analysis and presentation of general group information.

I/we have read and understand these guidelines. I/we have discussed any concerns or relevant issues with our MCS therapist. I/we will identify below any exemptions or limitations to this consent.

**Exemptions/limitations:** □ None □ Other Specify: ______________________

______________________________
______________________________

I/we hereby give consent for this research to be conducted with my/our file information.

______________________________ Date ________________________________
Signature of Client

______________________________ Date ________________________________
Signature of Client

Thank you for your support in this important project.

MCS 10/00