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The Use of the Minnesota Multiphasic Personality Inventory-II (MMPI-2) in Pre-employment Evaluations

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The Use of the Minnesota Multiphasic Personality Inventory-II (MMPI-2) in Pre-employment Evaluations

by

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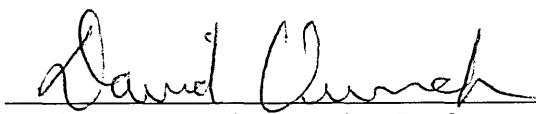
Each person whose signature appears below certifies that this dissertation in his opinion is adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



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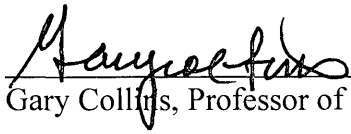

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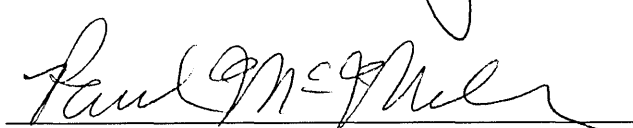

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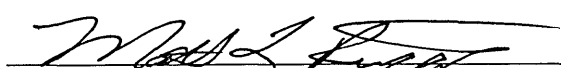

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ABSTRACT OF THE DISSERTATION

The Use of the Minnesota Multiphasic Personality Inventory-II (MMPI-2)

In Pre-employment Evaluations

by

Ana M. Gamez

Doctor of Philosophy in Clinical Psychology
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Dr. David Vermeersch, Chairperson

Psychological testing is an important facet in the selection and hiring processes of law enforcement and public safety personnel. Research in this area suggests that the MMPI-2 scales have been correlated with problematic behavior among police officers, poor job performance, and officer misconduct. This study examined the extent to which suitability for hire could be predicted by the MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). It examined whether profile differences emerged as a function of suitability across gender, between gender, and within gender. It was hypothesized that overall profile differences would emerge by suitability. Specifically, that suitability (suitable, unsuitable) would be predicted by the MMPI-2 validity scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma) for the male and female applicants. It was hypothesized that there would be overall profile differences within and across gender. Specifically, suitable female applicants would exhibit higher scale elevations on scale 5 (Mf) Masculinity-Femininity in

comparison to the unsuitable female applicants. On the other hand, suitable male applicants would exhibit lower scores on Scale 5 (Mf) Masculinity-Femininity in comparison to the unsuitable male applicants. A total of N=1,264 archival pre employment psychological records of applicants applying to a law enforcement peace officer position were reviewed. A multivariate analysis of variance (MANOVA), profile analysis statistical technique was used to assess profile differences by suitability across gender, between gender, and by gender. A logistic regression analysis was used to predict suitability classification by selected MMPI-2 scales. No significant MMPI-2 profile differences emerged by suitability. However, significant differences emerged in scale L (Lie), Infrequency scale (F), and scale 4 (Pd) when the means of these scales were compared to the pooled means for each of the analyses. Significant MMPI-2 profile differences emerged by gender. Scale 5 Masculinity/femininity (Mf) accounted for 63.5% of the proportion of variance explained. Specifically, female applicants scored significantly higher on scale 5 Masculinity/femininity (Mf) in comparison to male applicants.

Introduction

The selection and hiring practices of law enforcement personnel has evolved over the past several decades. In more recent years, law enforcement agencies nationwide have recognized the importance of selecting psychologically healthy individuals and selecting out psychopathology (Blau, 1994). As a result, agencies routinely screen the applicants they are interested in hiring. In California, the Commission on Peace Officer Standards and Training (CA POST) has provided recommendations for the selection of law enforcement officers. These recommendations also highlight the role of the evaluator (e.g., psychologist/physician). The evaluator in pre-employment screenings provides a recommendation about the suitability of the applicant for the position of law enforcement officer. Suitability recommendations are provided to the hiring agency. It is the hiring agency who makes a decision to hire or not hire a prospective applicant. The recommendations set forth by CA POST state that evaluators must be competent in order to conduct pre-employment screenings. A competent law enforcement psychologist must integrate their clinical training, the job requirements for police officers, and the recommendations set forth by CA POST. It has become standard practice for evaluators to use psychological testing in pre-employment evaluations. The Minnesota Multiphasic Personality Inventory-II (MMPI-2) has become one of the most widely used self-report objective instruments in the pre-employment evaluation of law enforcement applicants. The MMPI-2 validity Scale L (Lie), and Scale K (Correction) have been found to be useful in helping to predict problematic behaviors (Weiss, Davis, Rostow, & Kinsman, 2003; Borum & Stock, 1993), job performance and officer misconduct (Hartman, 1987; Hargrave & Berner, 1984).

However, there has been a lack of research that informs us about profile differences that may exist between suitable and unsuitable applicants striving to become law enforcement officers.

This study examined the extent to which suitability for hire could be predicted by the MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). It examined whether profile differences emerged as a function of suitability across gender, between gender, and within gender. In addition, an exploratory analysis for female applicants by suitability was also conducted.

The study hypothesized that overall profile differences would emerge by suitability. Specifically, that suitability (suitable, unsuitable) would be predicted by the MMPI-2 validity scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). The unsuitable male applicants would exhibit higher elevations on validity scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma) in comparison to the suitable applicants. An exploratory analysis by gender was also conducted. It was hypothesized that there would be overall profile differences within and across gender. Specifically, suitable female applicants would exhibit higher scale elevations on scale 5 (Mf) Masculinity-Femininity in comparison to the unsuitable female applicants. On the other hand, suitable male applicants would exhibit lower scores on Scale 5 (Mf) Masculinity-Femininity in comparison to the unsuitable male applicants.

This study reviewed a total of N=1,264 archival pre-employment psychological records of law enforcement applicants. After the deletion of 17 cases (see participant method section), a total of N= 1,247 cases remained in the analysis. Of the total cases reviewed, 95.4% (n=1,190) were suitable applicants, and 4.6% (n=57) were unsuitable applicants. A total of 88.5% (n=1,104) were male, and 11.5 % (n= 143) were female. In the suitable group, a total of 88.5% were male (n=1,053), and 11.5% were females (n=137). In the unsuitable group, a total of 89.5% (n=51) were males, and 10.5% were females (n=6).

Data was analyzed using the Predictive Analytics SoftWare (PASW) formally known as SPSS. A multivariate analysis of variance (MANOVA), profile analysis statistical technique was used to assess profile differences by suitability across gender, between gender, and by gender. A logistic regression analysis was used to predict suitability classification by selected MMPI-2 scales. The scales selected to predict suitability classification were those that were found to be significant in the profile analysis, hypothesis 1 (combined gender). The selected MMPI-2 scales were scale L (Lie), Infrequency scale (F), and scale 4 Psychopathic Deviate (Pd).

No significant MMPI-2 profile differences emerged by suitability. However, significant differences emerged in scale L (Lie), Infrequency scale (F), and scale 4 (Pd) when the means of these scales were compared to the pooled means for each of the analyses. Significant MMPI-2 profile differences emerged by gender. Scale 5 Masculinity/femininity (Mf) accounted for 63.5% of the proportion of variance explained. Specifically, female applicants scored significantly higher on scale 5 Masculinity/femininity (Mf) in comparison to male applicants.

Literature Review

Introduction

In 2006, the U.S. Department of Labor reported that approximately 861,000 peace officers were employed nationwide. Over the next decade, that figure is expected to increase at least by 11% nationwide due to heightened security concerns and population growth (Bureau of Labor Statistics, 2008-09 Ed). While more police officer vacancies are projected to be needed nationwide, policing careers are not for everyone. Law enforcement is a profession that requires a certain level of plasticity and malleability in various situations. It is a demanding field with a high probability of being a stressful and dangerous profession. At some point, most police officers are exposed to some form of trauma –direct or indirect, threatening situations, and criminal behavior (Bureau of Labor Statistics, 2008-09 Ed). Peace officers are held to high standards, given authority under state and federal law to enforce criminal laws judiciously, maintain order, and ensure the safety and protection of citizens. They are also expected to pursue and apprehend suspects who violate the law (Bureau of Labor Statistics, 2008-09 Ed). The responsibility set forth upon police officers, to ensure the safety and protection of the public is not taken lightly by the community, as there is an inherent fear that some officers may use the authority vested in them in an unjust manner (e.g., excessive use of force, violations of the law, planting of evidence, or other violations). Ineffective police officers negatively impact the well-being of community members (e.g., safety and protection, antagonizing), endanger their own lives, and/or the lives of their partners, and negatively impact law enforcement organizations (CA POST, 2008; Castora, Brewster, & Stoloff, 2003). Over the past several decades, the

use of psychological testing as a tool for the selection and hiring of law enforcement personnel has evolved from being virtually nonexistent to becoming standard practice throughout the United States.

Trends in Policing

Policing in the United States has undergone significant changes over the past couple hundred years. According to Blau (1994), during the 18th and 19th centuries there were no systematic selection processes for the hiring of police officers. In the past, those who were offered police jobs were typically men who were "tough, young, aggressive, politically favored, and/or popular." In fact, one of the more common stereotypes of police officers was that they were "uneducated, brutal, quick to attack, and slow to reason" (Blau, 1994, p.17). By the mid 20th century, the structure of police organizations, and recruitment strategies began to shift. According to Blau (1994), this shift could be attributed to the growing need to control the emergence of gang-related criminal activity, changing expectations of policing (e.g., realizing that excessive use of force was both undesirable conduct and financially costly to the organization and community), and court decisions dictating acceptable police practices.

Since the 19th century, recruitment practices of law enforcement evolved and began to integrate methods that helped predict specific qualities and characteristics believed to increase the probability of success in policing (California POST, 2008). Over the past several decades, most police departments developed minimum selection requirements for the hiring of peace officers and began using psychological testing to accomplish this task (Blau, 1994). The purpose of a selection system of law enforcement personnel was "to *predict* success on the job" (O'leary, 1979, p.10).

O'leary further suggested that to adequately predict success on the job it was vital for organizations to clearly identify and delineate the specific qualities being sought in law enforcement applicants, and develop concrete and systematic ways of measuring those characteristics. According to Blau (1994), police officer selection served two important functions. These functions are (a) the selecting out of psychopathology and (b) the selecting in of individuals with certain desirable character traits believed to make them good officers. Namely, these traits included those of honesty, bravery, decisiveness, consistency, reliability, ability to function under stress, cooperativeness, traditional values, and respect for authority (Blau, 1994).

California Commission on Peace Officer Standards and Training (POST)

Minimum selection standards for employment into a law enforcement profession have been developed throughout the U.S. (e.g., legal history, driving history, financial history, moral character, and medical & psychological well-being; POST administrative Manual, 2008). For the purpose of this discussion, only the California Commission on Peace Officer Standards and Training (California POST, 2008) was used in this study. California POST was an organization originally established in 1959 by the Legislature to "set minimum selection and training standards for California law enforcement" in conjunction with the California Penal Code Sections 13503, 13506, and 13510 (CA POST Administrative Manual, 2008). California POST has developed minimum hiring requirements for police officer applicants consistent with the standards set forth by the California Penal Code and the California Government Code (Hargrave & Berner, 1984; CA POST Administrative Manuel, 2008). Specifically, to be considered for appointment as a peace officer, applicants must have passed a written examination,

physical agility test, background investigation, and psychological and medical examination (Hargrave & Berner, 1984; Johnson, 1983). The California Penal Code, section 13510 (a) mandated that peace officers should be physically, mentally, and morally fit. The California Government Code section 1031 (f), mandates that peace officers should be "free from any physical, emotional, or mental condition that might adversely affect the exercise of their powers as a peace officer" (California Government Code: Division 4, Chapter 1, Article 2, section 1031 f, 2008). According to the California Commission on Peace Officer Standards and Training (POST), all law enforcement applicants must be "free from any job-related psychopathology" that would interfere with their duties as peace officers (Hargrave & Berner, 1984, pg 5; California POST Administrative Manuel, Commission procedure C-2, section 2-1, 2008). California Government Code, section 1031(f) mandates that pre-employment psychological screenings be conducted by a physician or licensed psychologist (California Government Code, 2008; Hargrave & Berner, 1984). According to Hargrave and Berner (1984), the state of California requires that evaluators be knowledgeable in the most current Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR, 2000), the job duties of officers, and specific research pertaining to job selection and psychological testing. In addition, evaluators must have knowledge in labor laws, regulations and guidelines, agency selection and recruitment goals. Additionally, evaluators should have criterions for the disqualification of unfit applicants (Hargrave & Berner, 1984). Together, these factors could help promote an informed and objective decision-making process to determine applicant suitability for hire (Hargrave & Berner, 1984).

Law enforcement organizations have sought individuals with certain desirable attributes that would likely predict success as a peace officer (Yarmey, 1990; Lorr, & Strack, 1994; Lough, & Ryan, 2006; Mills, & Bohannon, 1980). These characteristics include those of good judgment, decision-making skills, ability to function under stress, effective communication, and leadership capabilities (Yarmey, 1990). More recently, in 2006, the California Commission on Peace Officer Standards and Training (2006) approved psychological screening dimensions (see Table 1) to guide the pre-employment psychological screenings of law enforcement applicants. According to POST, the purpose of the following dimensions is to help evaluators identify desirable and undesirable characteristics of police officers.

The Use of Psychological Testing of Police Applicants

Psychological evaluations of police applicants have gradually become standard practice among law enforcement agencies throughout the United States (Hargrave & Berner, 1984; Hartman, 1987; Hiatt & Hargrave, 1988; Kenny & Watson, 1999). However, the psychological screening of police applicants has been critically evaluated and its utility questioned (Hogg & Wilson, 1995). Over the past several decades, there has been a growing interest to understand the personality characteristics of individuals drawn to law enforcement careers (Aamodt, Brewster, & Raynes, 1998; Aamodt & Kimbrough, 1985; Biggam, & Power, 1996; Hennessy, 1999; Hogan, 1971; Hogan & Kurtines, 1975; Johnson & Hogan, 1981; Lester, Babcock, Cassisi, Genz, & Butler, 1980; Tong, Bishop, Diong, Enkelmann, Why, Ang, & Khader, 2004). Psychological testing provides useful information on the personality characteristics, traits,

Table 1

Psychological Screening Dimensions (2006)

Dimension	Brief Description
Social Competence	Ability to work well with others, empathy, interpersonal skills, & tolerance.
Teamwork	Ability to work well with others & collaboration.
Adaptability & Flexibility	Ability to adjust to various unstructured situations with minimal supervision.
Conscientiousness & Dependability	Reliable, work ethic, & punctuality.
Impulse Control & Attention to Safety	Ability to control impulses and thinking prior to engaging in certain behaviors.
Integrity & Ethics	Honesty & trustworthiness.
Emotion Regulation & Stress Tolerance	Ability to perform well under stressful situations and adequate control of emotions.
Decision-Making & Judgment	Ability to make good decisions using inductive and deductive reasoning.
Assertiveness & Persuasiveness	Ability to take control of situations, proper demeanor.
Avoiding Substance Abuse & Risk-taking behaviors	

California Commission on Peace Officer Standards and Training (2006)

psychopathology, and test-taking attitudes that evaluator(s) can use to inform their recommendation of suitability to hire (Inwald, 1987). As early as 1950, psychological testing for the purposes of police selection and the prediction of employment success began to emerge (Blau, 1994; Humm & Humm, 1950; Kenney & Watson, 1999).

According to Blau (1994), in 1954 the Los Angeles Police Department implemented specific psychological screening procedures for the evaluation of police applicants that included a battery of psychological testing (e.g., MMPI, Rorschach, Tree Drawing, and a clinical interview).

Some of the more commonly used assessment instruments in law enforcement pre-employment screenings include the Minnesota Multiphasic Personality Inventory-II (MMPI-I & 2), California Psychological Inventory (CPI), the Sixteen Personality Factors (16-PF), Edwards Personal Preference Schedule (EPPS), and the Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B; Johnson, 1983; Hargrave & Berner, 1984; Hartman, 1987; Hiatt & Hargrave, 1988). The California Commission on Peace Officer Standards and Training (POST) provide recommendations as to the types of instruments that should be used in psychological evaluations. California POST Commission recommends the use of objective measures (e.g., MMPI) in lieu of projective measures (e.g., Rorschach), as the validity and reliability of objective measures tends to be higher than projective tests and hence, easier to support in court if challenged (Hargrave & Berner, 1984).

The Commission on Peace Officer Standards and Training (POST) has recommended the use of certain types of testing protocols in pre-employment screenings. According to Hargrave & Berner (1984), POST recommends that a minimum of two objective psychological tests be administered to applicants. It is recommended that at least one of those protocols assess for normal personality characteristics; the second protocol should examine for the presence of psychopathological characteristics or tendencies. According to POST, the purpose for

selecting objective measures in pre-employment screenings was to enhance the reliability (e.g., test-retest) and validity (e.g., construct) of results. An advantage with using objective measures is the ease of administration of self report measures. Objective measures also provide useful information about under-reporting, "faking good," defensiveness, and honesty of some applicants (Hartman, 1987, Green, 2000).

Trends in Psychological Testing

Numerous psychological instruments have been used to assess the psychological characteristics of law enforcement applicants. Over the past several decades, the types of instruments used in the evaluation of police officers have shifted. For instance, in the early 1980's the use of projective tests tended to be much more common than objective measures (Johnson, 1983). Johnson (1983) identified the most common psychological instruments used in the evaluation process of New Jersey police officers and fire fighters who had been disqualified from the process and were appealing the psychological disqualification to the Civil Service Medical Review Board. The results of that study suggested that projective tests were among the most frequently administered psychological instruments, followed by self-report objective measures, general intelligence instruments, situational tests, aptitude tests, and interest and attitude measures, respectively. Specifically, approximately 41% of the psychological test administrations identified in this study included a projective instrument (e.g., Sentence Completion, Rorschach, Projective Drawings, and Thematic Apperception Test); the most commonly used projective measure was the sentence completion test. About 30% of the psychological tests identified in this study were self-report measures; the MMPI was the most commonly used self-report instrument. As a selection tool, Hargrave and

Berner (1984), have suggested that the MMPI is the "best test available for objectively identifying potential psychopathological factors in applicants," although they do recommend additional research to continue to examine its utility with law enforcement applicants (p. 23).

The Development, Norms & History of the MMPI-I & MMPI-2

The Minnesota Multiphasic Personality Inventory (MMPI-I) has become one of the most frequently used objective personality measures to assess psychopathology (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989; Hathaway & McKinley, 1940; Green, 2000; Groth-Marnat, 2003; Nichols, 2001). The MMPI-I, originally developed in 1940 and published in 1942 by Hathaway and McKinley, consisted of 504 items (Butcher et al., 1989; Macintyre, Ronken & Prenzler, 2001). The instrument was developed at the University of Minnesota and normed with non-patients who ranged in age between 16-65-years; with an average age of 35-years. The original sample was primarily Caucasian, married, had about an eighth grade educational level, and lived in a small town or rural area (Butcher et al., 1989; Greene, 2000). The items on the MMPI-I scales were developed empirically, hence, interpretation of scale elevations did not necessarily indicate that the client met the criteria for a specific diagnosis; rather it indicated that the individual endorsed the same items that someone with that specific diagnoses probably endorsed (Greene, 2000; Groth-Marnat, 2003). According to Butcher et al. (1989), by 1950 the format and structure of the MMPI-I had stabilized and its acceptance within the U.S grew significantly. However, the MMPI-I was re-standardized into what is now known as the MMPI-II to accommodate cultural and population shifts (Butcher et al., 1989; Greene, 2000). In the re-standardization

process, 13-items from the original MMPI-I standard validity and clinical scales and 77 items from the last 167 items were deleted, 86 items were added to new scales, and 21 un-scored items were included (Butcher et al., 1989).

The MMPI-2 (Butcher et al., 1989; Hathaway & McKinley, 1983) is a self-report objective personality measure that consists of a total of 567 items. It was re-standardized using a sample of 2,600 individuals (1,138 males and 1,462 females, age range of 18-89 yrs, and ethnicity consisting of 81% Caucasian, 12% Black, 3% Native American, 2.8% Hispanic, and .7% other) from various states including California, Minnesota, North Carolina, Ohio, Pennsylvania, Virginia, Washington, military personnel (US bases), and Native American reservations (Washington state; Butcher et al., 1989; Greene, 2000). The scoring system of the MMPI-2 consists of converting raw scores into standardized T-scores. Scale elevations above a T-score of 65 are interpreted using code-types and T-scores below 65 are considered to be "within normal limits" (Greene, 2000, p.2). Overall, the reliability coefficients of the MMPI-2 scales range from moderate to very strong. Specifically, Butcher et al. (1989) reported that the MMPI-2 test-retest reliability coefficients range from .67-.92 for males and .58 to .91 for females. According to Butcher et al. (1989) this variability may be due to the inter-correlations between some of the scales such as those reported among scales 7 Psychasthenia (Pt) and scale 8 Schizophrenia (Sc) (Groth-Marnat, 2003). Also, the MMPI-2 has validity scales that assess test-taking attitudes.

The MMPI-2 has the following validity scales: (a) Cannot Say scale, (b) Variable Response Inconsistency (VRIN) scale, (c) True Response Inconsistency (TRIN) scale, (d) Infrequency (F, F_B, and F_P) scales, (e) Lie (L) scale, and (f) K

(Correction) scale. The Cannot Say scale is comprised of the items that the participant failed to answer and thus, it does not include specific items (Greene, 2000). However, as the number of items omitted approaches 25 or more, the probability that the MMPI-2 is invalid increases (Greene, 2000). According to Greene (2000), the participants' motivation for omission of items is important for understanding why they failed to answer specific questions. For instance, is the participant "unwilling" or "unable" to respond to the items (Greene, 2000, p.46)? According to Greene (2000), additional research is needed to fully understand the reasons for omission of specific questions on the MMPI (See Greene, 2000, p. 47 for a list of the most frequently omitted MMPI-2 items).

The Variable Response Inconsistency (VRIN) scale is comprised of 67 pairs of items meant to be endorsed consistently and scored only if the participant responds in an inconsistent manner (Greene, 2000). The True Response Inconsistency (TRIN) scale consists of 23 pairs of items in which the participant responds in an inconsistent manner (e.g., true or false to both items; Greene, 2000); these items are scored if the participant responds in a consistent manner to both items. Interpretation of levels of consistency in item endorsement for the VRIN and TRIN scale are as follows: low (0-2), normal (3-7), marginal (8-10), and marked (11+), the more pairs of items a participant responds to inconsistently may serve to invalidate the interpretation of the MMPI (Greene, 2000). According to Greene (2000), there are several reasons why someone may respond inconsistently to pairs of items. Some of these reasons include providing examinee with insufficient information about the purpose of the testing, inadequate reading ability, comprehension, low intellectual ability, neuropsychological difficulties or impairment,

substance abuse intoxication, noncompliance, or lack of cooperation. According to Greene (2000), the VRIN scale is not impacted by psychopathology or over-reporting as individuals who tend to over-report are likely to endorse items in a more consistent manner. The Infrequency scale (F, F_B, and F_P) on the other hand, is comprised of items that are less frequently endorsed by most people (less than 10%) and might be indicative of psychopathology or over-reporting (Greene, 2000). For instance some of the items in this scale include "bizarre sensations, strange thoughts, peculiar experiences, feelings of isolation and alienation, and a number of unlikely or contradictory beliefs, expectations, and self-descriptions (Dahlstrom et al., 1972 in Greene, 2000, p.67; Dahlstrom, Welsh, & Dahlstrom, 1975)." According to Green (2000), it is important to develop working hypotheses that help explain reasons for scale elevations (e.g., why the inconsistency in reporting, probability of over-reporting, and presence of psychopathology).

Other validity indexes that are important in the interpretation of the MMPI-2 include scale L (Lie) and scale K (correction). The Lie scale (15-items) is designed to identify individuals who are purposefully attempting to lie and portray themselves in a positive light (Greene, 2000; Groth-Marnat, 2003). A high score on the L scale (raw score 8+; Greene, 2000) suggests that the individual is denying the presence of minor flaws and may be attempting to present themselves in an unusually moralistic and perfect manner (Groth-Marnat, 2003). A low score on the L scale (raw score of 0-2) suggests that the individual responded in an honest manner (Greene, 2000). According to Greene (2000), too low of a score may suggest that the examinee attempted to present a pathological profile. The validity scale K (correction) also attempts to identify

individuals who are attempting to present themselves in a positive light but the items are much more subtle than the L scale (Groth-Marnat, 2003). In fact, according to Groth-Marnat (2003) "naïve, moralistic, and unsophisticated individuals would score high on L, and more intelligent and psychologically sophisticated persons might have somewhat high K scores (p. 245)." Butcher et al. (1989) suggested that it may be likely that individuals with a social standing or higher socioeconomic status may tend to be apprehensive of disclosing issues that would suggest insecurity, self-doubt, or emotional concerns. According to Greene (2000), reasons for attempting to underreport symptoms of psychopathology may also be directly linked to the original reason for seeking psychological services (e.g., personnel selection-pre-employment, transferring to another organization, ordered to be tested, and denial of psychological problems). In pre-employment screenings it is not uncommon that applicants attempt to portray themselves in a positive light (Greene, 2000). Butcher et al. (1989) recommended that evaluators examine the personal history, and other available data to evaluate a person's level of functioning and adjustment.

The clinical scales of the MMPI-2 are as follows (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer; 1989; Greene, 2000): scale 1 Hypochondriasis (Hs) (32- items) identifies individuals with an excessive concern or preoccupation with physical symptoms, scale 2 depression (D) (57- items) identifies individuals reporting to symptoms of sadness and a depressed mood, scale 3 Hysteria (Hy) (60- items) identifies individuals with somatic types of symptoms, scale 4 Psychopathic Deviate (Pd) (50- items) identifies issues related to family discord, problems with authority, self alienation, social alienation, and boredom, scale 5 Masculinity-Femininity (Mf) (56-

items) identifies the masculine and feminine roles of men and women, scale 6 Paranoia (Pa) (40- items) identifies issues related to suspiciousness, hostility, and sensitivity, scale 7 Psychasthenia (Pt) (48-items) identifies individuals who may have symptoms of anxiety, rumination, obsessions, and certain fears, Scale 8 Schizophrenia (Sc) (78-items) identifies symptoms related to bizarre thought processes, social alienation, emotional alienation, and dissociation, scale 9 Hypomania (Ma) (46-items) identifies over-activity, psychomotor acceleration, emotional lability, feelings of grandiosity, egocentricity, and scale 0 Social Introversion (Si) (69 items) assesses social introversion and extroversion (Butcher et al., 1989; Greene, 2000; Groth-Marnat, 2003; Nichols, 2001).

Gender Issues & MMPI-2

The gender differences that have been reported on the MMPI-2 basic scales suggest that females are more likely to report psychopathological symptoms than their male counterparts (Greene, 2000). According to Greene (2000), women tend to endorse more items on scale 1 Hypochondriasis (Hs), scale 2 Depression (D), scale 3 Hysteria (Hy), scale 7 Psychasthenia (Pt), and scale 0 Social Introversion (Si) whereas, males tend to endorse more items on scale 9 (Hypomania). These differences however, are minimal when raw scores are converted to standardized t-scores (Greene, 2000). According to Greene (2000), overall, minimal item endorsement differences have been found between men and women on all basic scales except scale 5 Masculinity-Femininity (Mf). Scale 5 (Mf) Masculinity-Femininity includes items pertaining to vocational interests, hobbies, aesthetic interests, and traditional gender roles of both males and females, and scale elevations are opposite for both genders (Greene, 2000).

According to Butcher et al (1989), the standardized scale 5 t-scores for males are as follows: (a) low scores (T 40 or below) suggests a strong identification with a traditional masculine role, someone who is crude, aggressive, reckless, action-oriented, and self-confident, (b) modal scores (T 41-55) suggest someone who is practical, easy-going, and conventional, (c) moderate scores (T 56-65) suggest the presence of common sense, self-control, expressiveness and demonstrativeness, (d) high scores (T 66-75) suggest someone who is tolerant of others, curious, creative, and individualistic, and (e) very high scores (T 76 and above) suggest a male with strong identification to traditional feminine interests, perhaps someone with conflict over his sexual identity, extreme passivity, and insecurity with assertiveness. The standardized scale 5 t-scores for females are as follows (Butcher et al, 1989): (a) low scores (T 40 or below) are indicative of traditional feminine interests, insecurity, self-depreciation, passivity, submissiveness, dependence, and helplessness, (b) modal scores (T 41-50) are indicative of someone who is empathic, idealistic, competent and considerate, (c) moderate scores (T 51-59) suggest someone who is active, adventurous, spontaneous and assertive, (d) high scores (T 60-69) suggest someone with self-confidence, unemotional, adventurous, and assertive, and (e) very high scores (T 70 and above) suggest a female with traditional masculine interests, someone who may be dominant and aggressive.

Gender differences have been found on the MMPI-2 content scales (raw score), supplementary scales (raw score) and specific item endorsement. For example, Greene (2000) reported higher (raw scores) for females on the content scales of Anxiety (ANX), Fears (FRS), Obsessions (OBS), Depression (DEP), Health Concerns (HEA),

Low Self-Esteem (LSE), Family Problems (FAM), Work Interference (WRK), and Negative Treatment (TRT); whereas, males had higher (raw scores) on the Cynicism (CYN), Antisocial Practices (ASP), and Type A (TPA) content scales. Greene (2000) did not report any gender difference on the content scale of Anger (ANG). According to Greene (2000), gender differences have also been noted on the MMPI-2 supplementary scales. Specifically, females have reported higher (raw scores) on the Anxiety (A), College Maladjustment, (Mt), Post Traumatic Stress Disorder-Keane (PK), Post Traumatic Stress Disorder-Schlenger (PS), Over controlled-Hostility (Ho) and low scores on Ego Strength (Es) scale; whereas, males have obtained higher (raw scores) on the MacAndrew Alcoholism-Revised (MAC-R), Addiction Admission (AAS), Addiction Potential (APS), and Common Alcohol Logistic-Revised (CAL-R) scales. On specific items of the MMPI-2, Greene (2000) reported that both genders were likely to endorse the use of alcohol, difficulty with the law, getting drunk or high, and hurting another in a physical altercation. Women however, were more likely to endorse items related to suicidal ideations compared to their male counterparts. Overall, higher raw scores for females could be observed on the basic, content, and supplementary scales. This raw score difference between males and females, has been attributed to the possibility that females are significantly more likely to report and endorse symptoms of psychopathology than males (Greene, 2000).

The Use of the MMPI with Police Populations & Norms

Researchers and practitioners have examined the utility of the revised MMPI-2 in comparison to the original MMPI. According to Blau (1994), the use of the MMPI-2, although not instantaneous, continues to be a commonly administered self-reported

measure in pre-employment screenings. Some researchers have compared structural differences between the original MMPI and the MMPI-2 (Davis, Rostow, Pinkston, & Cowick, 2004; Hargrave, Hiatt, Ogard, & Karr, 1994). In their study, Davis et al. (2004) examined the usefulness of the MMPI-I and the MMPI-2 in police officer selection of municipal officers and state troopers. These authors examined applicants using the original MMPI-I during 1995 through 1997 and used the MMPI-2 after January 1998. These authors examined police cadets who had been recently accepted into the academy. The police recruits were administered either the MMPI-I or the MMPI-2 and then interviewed by a licensed clinical psychologist. These authors collected three data sets. The first group consisted of administering the MMPI-I to cadets in a municipal law enforcement agency. The second group consisted of administering the MMPI-2 to cadets in a municipal agency. The third group consisted of administering the MMPI-2 to state trooper cadets. These authors used the MMPI-I and MMPI-2 scores for all groups to examine how well scores predicted passing or failing scores on the candidate interview and in the completion of the academy training. These authors reported that in group one, 26 of the 392 cadets failed the clinical interview, and in group two 5 of the 79 cadets tested failed the interview. In group three, the authors provided only available records of 95 state trooper cadets who successfully passed the clinical interview; however, 23 of those did not complete the academy training. The authors found that certain MMPI subscales, developed by Graham (1993), predicted the passing or failing of the clinical interview. Specifically, in group1 higher scores on subscales ORG, PD, F, MA1, SI6, and MF3 predicted a fail on the interview (accounting for 23% of variance), whereas, higher elevations on the F, PD2, MA, SC2 predicted a fail on the

clinical interview (accounting for 65.4% of variance); in group 3 the MMPI subscales MA, MACR, F, PD1, HEA3, MA3, L, DO, VRIN, and HEA1 tended to predict a fail in the interview (accounted for 36% of variance; Graham, 1993). Overall, these authors found that both the MMPI and MMPI-2 could help in classification of pass/fail of the psychological interview. Specifically, the MMPI-2 subscales developed by Graham (1993) accounted for 23%, 65.4%, and 36.2% of the variance in prediction of pass/fail of the interview across groups, respectively.

An important issue of the MMPI as a tool in job selection and research has to do with its predictive validity over time. Researchers have found that the MMPI profiles of active police officers change as a function of time on the force (e.g., academy, training, patrol; Blau, 1994; Beutler, Nussbaum, & Meredith, 1988). Over time, the profiles of officers tend to "show more somatic symptoms, more anxiety, and more alcohol vulnerability after years on the job," hence, elevations on the Infrequency scale (F), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), and scale 9 Hypomania (Ma) are not uncommon among this population (Blau, 1994, p.79). As a result, evaluators should use caution not to compare the profiles of applicants to existing police officers as the predictive validity of the test for the purposes of pre-employment screening is limited. Researchers have raised the issue that the profile of police applicants is different to the norms of the MMPI despite the fact that test norm data improved in the re-standardization process (Blau, 1994; Carpenter & Raza, 1987; Kornfeld, 1995). The MMPI profiles of individuals selected for peace officer positions tends to be slightly higher than the profiles of the MMPI norms (Carpenter & Raza, 1987). Accordingly, candidates selected for hire tend to show elevations on scale L

(Lie), scale K (correction), scale 2 Depression (D), scale 4 Psychopathic Deviate (Pd), scale 3 Hysteria (Hy), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), scale 8 Schizophrenia (Sc), and scale 9 Hypomania (Ma) (Blau, 1994).

The MMPI profiles of police applicants have been found to be somewhat different than the normative samples of the MMPI. For instance, Carpenter and Raza (1987) conducted a study examining the personality characteristics of police officer applicants between 1981 through1985. These authors assessed the applicants' psychological health, the extent to which officers as a group are homogenous, gender and age differences. Approximately 92% of applicants in this study were male and 8% were female, with an age range of 19-60 years of age, average age of 30-years. These authors found that male police applicants were similar to the normative sample (MMPI) in their level of "bodily concerns, psychological maturity, and comfort with social interactions" but tended to be distinct from the normative sample in that they tended to present themselves in a more favorable light, reported less depressive concerns, less anxiety, tended to be more assertive and energetic, and had a greater tendency to seek social contacts compared to the normative sample (Carpenter & Raza, 1987, p. 11). Similar results emerged when these authors assessed female applicants. Female police applicants were similar to the normative sample of the MMPI in their level of "bodily concerns and general anxiety," but were more likely to present themselves in a positive light, presented themselves in a less depressed manner and more psychologically mature, assertive and aware of the needs of others, and tended to be comfortable with interpersonal relationships (Carpenter & Raza, 1987, p. 11).

In comparing male and female applicants, Carpenter and Raza (1987) reported that females tended to have higher T-score elevations on Scales 4 (Pd) Psychopathic Deviate, Scale 5 (Mf) Masculinity-Femininity, and Scale 9 (Ma) Hypomania. Specifically, these authors concluded that "females tended to be much more assertive, nonconforming, and energetic compared to women in general (Carpenter & Raza, 1987, p.12)." An age analysis conducted by these authors suggested that older applicants tend to score significantly higher on the MMPI scale 1 Hypochondriasis (Hs), scale 2 Depression (D), scale 3 Hysteria (Hy), and scale 0 Social Introversion (Si), and lower on scale K (correction). These authors concluded that older applicants tend to report more bodily concerns due to stress, more introversion, and less satisfaction compared to younger applicants. These authors also found that in smaller departments, older applicants tended to apply, whereas in larger departments, younger applicants tended to apply. Carpenter and Raza (1987) seldom found MMPI elevations that were suggestive of emotional difficulty. These authors did conclude that police applicants were more similar (homogenous) to each other as a group than to the normative sample of the MMPI. Overall, police applicants were more likely to have a more positive image of themselves, more realistic complaints, adequate balance of optimism and pessimism, a tendency to conform to society's regulations, a healthy concern for others, and the capacity to establish social relationships (Carpenter & Raza, 1987).

Kornfeld (1995) examined police applicant performance using the MMPI-2 and addressed issues of gender, ethnicity, and norms. According to Kornfeld, additional MMPI norms are needed that more closely represent the police population as existing MMPI norms under-represent female police candidates. In his study, Kornfeld sampled

72 male candidates and 12 female candidates. The sample in this study were administered only the first 370 items of the MMPI (as those are the minimum number of items required to be able to interpret the MMPI when all the items are not completed; 370 items include scale L (Lie), Infrequency scale (F), scale K (correction), and the 10 clinical scales. Kornfeld (1995) found that the applicants presented with the typical MMPI profile of job applicants, namely elevated scale K (correction) scores were common and suggestive of defensiveness for both males and females. Females in this study also presented with moderate elevations on the scale Lie (L). According to Kornfeld, overall, the sample of candidates in the study appeared to be psychologically healthy and self-confident. Kornfeld found some gender role differences between male and female applicants. This author reported that both females and males tended to present themselves as having more typical masculine types of interests which may suggest more levels of assertiveness and self-confidence. Males tended to score low on Scale 5 Masculinity-Femininity (Mf), whereas, females scored high on Scale 5 Masculinity-Femininity (Mf). Kornfeld's study provided useful information about the utility of the MMPI and some differences that emerge in the profile of men and women, however, several limitations should be noted about his study. First, the relative small sample size of female candidates was a major weakness of this study that limited the types of generalizations that could be made about female applicant profiles. Second, while the validity scales and ten clinical scales of the MMPI-2 could be derived when only 370 items were completed, in actual pre-employment screenings it has been common standard practice to administer the entire protocol of 567 items.

A more recent study by Detrick, Chibnall, and Rosso (2001) used the MMPI-2 to provide normative data with law enforcement applicants and corroborated Kornfeld's (1995) findings. Both authors found that police applicants tend to provide defensive profiles. Detrick et al., found elevations on the L Scale (Lie) and Scale K (Correction) that did not change even when gender, race, tenure, and department were accounted for. According to Detrick et al., males presented "self-confidence, lacking depression, and interpersonal comfort," whereas, women tended to reject traditional female roles (p.487). These authors also reported that Military Veteran applicants scored lower on Scale 9 Hypomania (Ma) and higher on Scale 3 Hysteria (Hy), and proposed the possibility of the underreporting of symptoms, and possible vulnerability to stress (Beutler, Nussbaum, & Meredith, 1988).

Early Studies Using the MMPI with Police Applicants

Early research studies examining the utility of the MMPI with police applicants have provided useful information about the strengths and weakness of psychological testing in pre-employment evaluation. An early study by Azen, Snibbe, Montgomery, Fabricatore, and Earle (1974) re-analyzed data from an early study by Earle in 1973, that originally had examined the effects of authoritarian vs. nonauthoritarian training styles. Azen et al. (1974) attempted to find predictors of resignation and performance among present officers, within the first two years of hire. Specifically, these authors examined whether psychological tests such as the MMPI and the Edwards Personal Preference Schedule would help to identify those officers who would resign during the academy phase or during the first two years of employment as peace officers. These authors sampled only males and used the following criterions: (a) whether cadet

resigned prior to the completion of training, (b) whether cadet resigned within the first two years of having completed the academy training, and (c) field performance, if they did not resign prior to the first two years. Azen et al. (1974) measured performance using the following categories: (a) personal appearance, (b) communication, (c) public and personal relations, (d) job knowledge, (e) following instructions, (f) attitude towards duties, (g) adaptability, (h) judgment, (i) initiative, (j) responsibility, and (k) leadership and found that peer evaluations significantly predicted performance out in the field. These authors also reported that military experience tended to predict resignation, specifically officers who had spent more time in the military tended to stay with the department longer than those with no military experience. These authors also reported that low scores on the MMPI scale 5 Masculinity-Femininity (Mf) tended to be associated with non-resignation among males.

Another early study by Saxe and Reiser (1976) examined the utility of the MMPI as an effective tool for the screening of law enforcement applicants and predicting success as an officer. These authors randomly selected police officer applicants who had been tested in 1970 from one of three groups: (a) applicants who had been hired by the Los Angeles Police Department (LAPD) in 1970, (b) applicants who were rejected by LAPD because they had failed the psychiatric evaluation, and (c) applicants who had been hired by LAPD but removed from the organization within three years post hire. These authors concluded that the MMPI profile of applicants who had become successful LAPD officers was significantly different from the profile of applicants rejected because they had failed the psychological evaluation; the profile of the successful officers was also different from those who had passed the psychological

evaluation but were later terminated by LAPD. Specifically, those who became successful officers had higher scores on scale L (Lie), scale K (correction), scale 3 Hysteria (Hy), and scale 6 Paranoia (Pa), whereas, the group who had originally been hired but terminated and those who failed the psychiatric evaluation had significantly higher scores on Scale 7 Psychasthenia (Pt). Applicants who were rejected showed higher scale elevations on the Infrequency scale (F), scale 1 Hypochondriasis (Hs), scale 4 Psychopathic Deviate (Pd), scale 7 Psychasthenia (Pt), scale 8 Schizophrenia (Sc), scale 9 Hypomania (Ma), and scale 0 Social Introversion (Si).

Hargrave and Berner (1984) compared the MMPI profiles with a criteria of success from the academy training and found that individuals with clinical elevations (T>70) were significantly less likely to complete the academy. These authors reported that 73% of recruits with elevations on the anxiety scale did not complete the academy, followed by 36% with elevations on psychotic scales, and 30% with elevations on the personality disorder scales, respectively. Overall, these authors reported that 39% of those recruits with profiles that would be considered clinical (T-scores above 65) did not complete the academy and an additional 16% of those recruits received low ratings in emotional stability. These authors reported that many individuals with elevations on scale 9 (Ma) successfully completed the academy.

Merian, Stepfan, Schoenfeld, and Kobos (1980) examined police applicants and developed a 5-item MMPI research index in an attempt to predict unacceptable officers from acceptable ones. These authors examined archival pre-employment screening evaluations of 424 applicants, 23 of whom were initially rated as unacceptable, all of whom had been hired by the department. These authors matched each unacceptable

officer with two acceptable officers and matched them according to length of service. Merian et al., (1980) compared the MMPI items of the acceptable group with the unacceptable group and found that only 31 items were significantly different between the two groups of officers, and reported that only 5 of those items distinguished the acceptable group from the unacceptable one. These items included: I seldom worry about my health, I am an important person, what others think of me does not bother me, I think I like the work of a building contractor, and a large number of people are guilty of bad sexual conduct. These authors reported that the unacceptable group was more likely to respond that they worried about their health and that what others thought about them really bothered them. The unacceptable group was also less likely to endorse that they were an important person, that they would like to be a building contractor, and that a large number of people were guilty of bad sexual behavior. These authors concluded that the 5-item index produced a correct classification of acceptable and unacceptable officers about 71% to 80% of the time. A subsequent study by Dralle and Baybrook (1985) did not find supporting evidence of Merian's 5-item MMPI index.

Dralle and Baybrook (1985) used the MMPI subscales to develop indexes to help identify applicant suitability for police work. Dralle and Baybrook (1985) attempted to replicate the validity of the 5-item MMPI index designed to differentiate between acceptable and unacceptable police officers (Merian, Stefan, & Schoenfeld, 1980). These authors sampled 356 police applicants who had applied for a law enforcement position between 1980 and 1981 and used the following screening criteria: police recommendation, psychologist and/or psychiatric evaluation, and applicant acceptability for hire to determine the meaningfulness of the research index. They

concluded that the 5-item MMPI research index (Merian, Stefan, & Schoenfeld, 1980) was not related to the screening decisions and hence, suitability for hire. Thus, they were unable to distinguish between acceptable and unacceptable police officers using the indexes they used in the study.

Another study conducted by Hargrave, Hiatt, and Gaffney (1988) examined the Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 9 Hypomania (Ma), and Cn scales of the MMPI. These authors hypothesized that the index obtained from those subscales would help predict excessive use of force among officers given that "scale F elevations indicated potential psychopathology; elevations on scale 4 were associated with impulsivity, low frustration, and poor social adjustment; elevations on scale 9 reflected potential manic excitement, agitation, and irritability" (Hargrave et al., 1988, p.269) and the Cn scale was designed to identify controllability of psychological adjustment (Cuadra, 1956, as cited in Hargrave, Hiatt, & Gaffney, 1988). These authors used the following groups: (a) highly aggressive officers (n=12), (b) highly aggressive applicants (n=52), (c) mildly aggressive applicants (n=882), (d) nonaggressive officer controls (n=12), (e) nonaggressive applicant controls (n=52), and (f) nonaggressive applicants (n=500). The aggressive applicant groups were matched with non-aggressive applicants. Hargrave et al. (1988) reported that the F+4+9 index correctly identified 56% of the aggressive and 60% nonaggressive applicants, whereas the F+4+9+Cn index correctly identified 60% of the aggressive applicants and 65% nonaggressive applicants. These authors concluded that the Cn Index (a scale developed by Huesmann, Lefkowitz, & Eron, 1978) improved the classification rates of aggressive applicants. Specifically, these authors reported that the aggressive applicants differed from the mildly aggressive

applicants, the controls, and the nonaggressive applicants on scale F and Cn. These authors recommended additional research with the F+4+9+Cn index they derived given that limited research has examined the use of Cn as a predictor for aggression among law enforcement officers (Hargrave, Hiatt, & Gaffney, 1988).

More Recent Studies Using the MMPI in Pre-Employment Screenings

More recent research studies using the MMPI-2 as a tool in pre-employment screenings have been conducted (Borum & Stock, 1993; Dantzker & Freeberg, 2003; Weiss, et al., 1999; Weiss, Serafino, & Serafino, 2000; Weiss, Davis, & Rostow, & Kinsman, 2003). The study by Borum and Stock (1993) examined defensiveness and overt deception in thirty-six law enforcement applicants using the MMPI. These authors compared applicants who admitted having been deceptive during the testing administration with applicants in which deception and defensiveness were not evident. These authors assessed the effectiveness of the MMPI validity scales in discriminating between deceptive and non-deceptive applicants and examined scale L (Lie) , scale K (correction), and the F-K index (Gough, 1950 as cited in Borum & Stock, 1993), Obvious-minus-Subtle (O-S) scale (Wiener, 1948; as cited in Borum & Stock, 1993), Positive Malingering Scale (Mp; Cofer, Chance, & Judson, 1949, as cited in Borum & Stock, 1993), Es-K Index, and GD scale (Inwald Personality Inventory-Guardedness scale). Borum and Stock (1993) hypothesized that the deceptive applicants would show higher scale elevations on L, K, Mp, and GD, and lower on the O-S, F-K Index, and Es-K Index. These authors found that the deceptive group showed higher elevations on scale L (Lie) and scale K (correction), more elevated scores on the Positive Malingering scale (Mp), and GD scale and lower scores on the Es-K index. These authors concluded

that the level of defensiveness was different between the groups. It was probable that the applicants who knew they had lied on their application were more likely to be defensive compared to the other group (Borum & Stock, 1993). These authors also noted no group differences in the F-K Index or the Obvious-Subtle scale.

The study by Weiss, Serafino, Serafino, Willson, Sarsany, and Felton (1999) examined the utility of the MMPI-2 in identifying personality characteristics among trainees who dropped out of the police academy training. According to these authors, there is an increased desire from law enforcement entities to identify the personality characteristics of those applicants who drop out of the academy training given that recruitment of qualified applicants is time consuming and costly. Of the twenty four applicants followed through the academy training, only fifteen successfully completed the training. Weiss et al., found a correlation between scale 5 Masculinity-Femininity (Mf) and drop out from the academy. Specifically, these authors reported that individuals who dropped out of the academy were significantly more likely to have a sensitive attitude compared to the trainees who remained in the academy. These findings were consistent with other research findings on scale 5 (Mf) Masculinity-Femininity with law enforcement officers, however, the results of this study were difficult to generalize as these authors did not provide demographic information (e.g. gender, age, education, and ethnicity) of participants and they used a relatively small sample.

The validity scale L (Lie) of the MMPI has been found to be one of the most useful predictors of success among law enforcement officers. In their study, Weiss, Serafino, and Serafino (2000) examined the interrelationship of the validity scales of the

MMPI, scale L (Lie) and scale K (correction), Inwald Personality Inventory, and Personality Assessment Inventory. These authors reported moderate correlations between scale L (Lie) of the MMPI and the Inwald Personality Inventory Guardedness (Gd), Hilson Life Adjustment Profile Lack of Candor Scale (LC), Inwald Survey 2 Denial of Shortcomings scale (DL), PAI Positive Impression scale (PIM), and the PAI Defensiveness Index (DEF). These authors extracted the following two factors from these validity scales. Factor 1, named "defensiveness" included the validity scales DL, GD, and LC; whereas, Factor 2, named "social desirability", included the validity scales of L, K, PIM, and DEF. These authors concluded that given that scale L (Lie) loaded heavily on both factors (.586 and .561, respectively), scale L (Lie) appeared to provide the best predictive validity compared to the other validity scales reviewed in their study.

Another study by Weiss, Davis, Rostow, and Kinsman (2003) examined the utility of scale L (Lie) of the MMPI in police performance. These authors reviewed the archival database records of an organization which stored employment selection information of police candidates. They reviewed records of 1,347 police candidates, and used records of 938 applicants who were given conditional offers of employment. These authors found that elevations on scale L (Lie) of the MMPI-2 were suggestive of problematic behaviors among the officers. Specifically, elevations on scale L (Lie) were correlated with termination from the force. According to these authors, scale L (Lie) is a subtle type of validity measure which could be used to examine the probability of problematic types of behaviors.

The Use of the MMPI with Duty Police Officers

Numerous studies have examined the use of the MMPI with active police officers in an attempt to examine changes in personality as a function of time of service, job performance and psychopathology (Beutler, Nussbaum, & Meredith, 1988; Hiatt & Hargrave, 1988). Blau (1994) reported that a consistent relationship exists between certain MMPI scales and long-term job performance. Specifically, the MMPI profiles of police officers tended to show higher scale elevations the longer they have been on the force (Blau, 1994). Elevations on the MMPI Infrequency scale (F), scale 1 Hypochondriasis (Hs), scale 7 Psychasthenia (Pt), scale 8 Schizophrenia (Sc), and 9 Hypomania (Ma) have been found to be associated with low job performance and elevations on the Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma) have been associated with officer misconduct (Hartman, 1987; Hargrave & Berner, 1984).

Early research by Bartol (1982) used the MMPI to examine the personality characteristics of police officers in a small town. This author sought to evaluate the relationship between the MMPI scale scores obtained at pre-employment and subsequent officer performance. Bartol sampled a total of 25 departments and inquired on 844 officers who had undergone pre-employment testing; he only received information on 102 male officers who were subsequently assigned to groups. The four groups in this study consisted of officers rated above average, average, below average, and a control group made up of college students. Bartol reported that at the time of the initial testing, none of the applicants had any prior police experience. This author found that the officer's profiles showed higher elevations on scale K (correction), scale 4

Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), and Scale 9 (Ma) Hypomania. The officers in this sample presented themselves in a positive light and denied psychopathological symptoms (Bartol, 1982). Bartol suggested that the defensive profile should be evaluated with caution as police officers may be attempting to put their "best foot forward" during employment evaluations (p. 60)." According to Bartol (1982), the elevations noted on scales 5 Masculinity-Femininity (Mf) and scale 6 Paranoia (Pa) suggested that the officers were likely "ambitious, competitive, persevering, and had more artistic interests than the control group (p. 60)." When Bartol compared the average group to the below average group, he found that the officers who were rated as below average showed higher elevations than the other groups on scale 5 Masculinity-Femininity (Mf); thus, it may have been likely that the below average group had different interest patterns compared to the other groups. These differences could have influenced success or lack thereof on the force (Bartol, 1982). Bartol has also suggested that scale 6 Paranoia (Pa) elevations may have indicated that the officers had a more cynical outlook even prior to entering law enforcement. Additionally, Bartol suggested that the scale differences found between the control group and the officers on scale 1 Hypochondriasis (Hs) suggested that officers report less physical complaints than the controls. Subsequent research has also found elevations on scales 4 Psychopathic Deviate (Pd) and scale 9 Hypomania (Ma) and a defensive profile among police officers (Weiss, et al., 1999). Bartol's finding that less successful police officers had higher elevations on scale 5 Masculinity-Femininity (Mf) has been supported by subsequent research (Weiss, et al., 1999).

The study by Beutler, Nussbaum, and Meredith (1988) examined the MMPI scores of newly hired police officers and re-evaluated them a total of four times throughout the duration of the study (4-years). These authors wanted to assess changes in personality patterns as a function of time on the job. They hypothesized that there would be increased levels of psychopathological symptoms and vulnerability to substance abuse and depression the longer the officers were on the force. Beutler et al., found higher elevations on the MacAndrews Alcoholism scale during the second evaluation in comparison to the initial evaluation. On the third evaluation officers showed significant differences in scale elevations on scale 1 Hypochondriasis (Hs), scale 3 Hysteria (Hy) and again on the MacAndrews Alcoholism scale in comparison to the initial evaluation. Although not statistically significant, the data in this study showed higher mean scores on scale L (Lie), Infrequency scale (F), scale K (correction), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), and scale 7 Psychasthenia (Pt). These authors concluded that police officer personality patterns changed as a function of time on the force. Specifically, many of these profiles suggested vulnerability to substance abuse and stress-related ailments thus indicating a decrease in psychological health. Beutler et al. (1988) suggested that over time the officers presented many somatic types of concerns, specifically, a "significantly higher level of neurotiform psychopathology than they had in their 1st year of service (p. 506)." Beutler et al. stated that the changes in the MMPI profiles of the officers in this study were noteworthy and warranted the attention of law enforcement organizations. Given that law enforcement had the potential of being a highly stressful profession it may be

been necessary to develop ways to address stress among the law enforcement community (Beutler et al., 1988).

Talley and Hinz (1990) conducted a study examining performance predictors of public safety and law enforcement personnel focusing on gender and age differences. These authors examined the archival records of 208 public safety officers in North Carolina whom had been selected for hire based on their work history, interviews, psychological testing and background. These authors reviewed psychological records (e.g., MMPI, Otis-Lennon Mental Abilities Test), performance ratings and demographic data (e.g., age at hiring, formal educational level, marital status, prior military history and prior police experience) of officers who had been employed 1 to 228 months. Tally and Hinz (1990) also reviewed performance evaluations obtained from supervisors from the agency and gathered information as to the officers: (a) quality of work, (b) job knowledge, (c) initiative, (d) personal relations, (e) dependability, (f) judgment, and (g) an overall performance rating. These authors used demographic data, MMPI validity and scales, the Defective Inhibition subscale of scale 9 Hypomania (Ma), MacAndrew Alcoholism scale and the Otis-Lennon DIQ to predict performance ratings by race and gender. Tally and Hinz (1990) found that age, education, scale K (correction), familial discord, authority problems, imperturbability and ego inflation were significant predictors of performance for white males, and accounted for 29% of the variance in job performance. Specifically, lower scores on family discord, imperturbability, higher levels of education, and younger age tended to predict better job performance, whereas, higher scores on ego inflation, authority problems, and scale K (correction) elevations tended to be indicative of more negative performance among White males. Also, these

authors concluded that age at the time of hire significantly predicted performance; specifically, younger applicants (30 years or younger), were more likely to receive better performance ratings than older applicants (30 years or older; 40 years or older, respectively). These authors also reported that 58% of the officers who were rated as excellent were under the age of 25 at the time of hire, whereas, about 15% excellent officers were 30 yrs of age or older, and 6% of officers were over the age of 40. Twenty-eight percent of officers rated as being "good" were over the age of 30, whereas, only 19% were over 40 and older. Furthermore, 46% of officers rated as "poor" were 30 years of age or older, 25% of officers rated as poor were 40 years of age or older, and 38% of officers rated as poor had been 25 years or younger at the time of hire.

Bartol (1991) conducted a 13-year longitudinal study examining predictive validity of the MMPI among small town police officers in a sample of 600 officers (536 men and 64 women) hired as patrol officers by the State of Vermont between 1975 and 1987. Of those, 129 officers left the respective department (44 were terminated or asked to resign). Thus, Bartol compared the MMPI profiles of the 471 officers who remained gainfully employed with the 44 who were asked to resign or were terminated. Bartol used the following measures in the study: MMPI, Behaviorally Anchored Rating Scale (BARS; A supervisory rating scale). The criterion used in this study was employability (retained vs. terminated officers), and the MMPI scores were used as a predictor. Bartol found that about 61% of terminations occurred within 1-yr, 84% of terminations occurred within 2-yrs, and about 90% of terminations occurred within 3-yrs. Bartol (1991) found that supervisory ratings (e.g., of job knowledge, judgment, dealing with

the public, dependability, compatibility, responsiveness to supervision, demeanor, ability to communicate, initiative, work attitude, and overall performance) tended to be lower as elevations on scale L (Lie), scale 4 Psychopathic Deviate (Pd), and scale 9 Hypomania (Ma) became more elevated; whereas, higher supervisory ratings (e.g., judgment, dealing with the public, dependability, demeanor, compatibility, responsiveness to supervision, ability to communicate, initiative, work attitude, and overall performance) were observed with higher scores on scale K (correction) or scale 3 Hysteria (Hy). Bartol reported that these supervisory ratings were significantly different between those officers who remained on the force compared to those who had been terminated. Bartol also reported that discharged officers tended to have less police experience, difficulties handling stress, and received lower supervisory ratings than retained officers. Specifically, individuals with elevations on scale L (Lie), scale 4 Psychopathic Deviate (Pd), and scale 9 Hypomania (Ma) tended to be perceived as immature, as behaving in inappropriate manner by their supervisors and were more likely to get in trouble for inappropriate behaviors (e.g., etiquette with the public, accidents with police vehicles, use of firearms or equipment, tardiness, absence, uniform appearance). This author developed an immaturity index combining scale L (Lie), scale 4 Psychopathic Deviate (Pd), and scale 9 Hypomania (Ma) and found that 77% of those officers who were predicted to succeed did succeed, and that 71% of those officers who were predicted not to succeed were terminated within 3-years. These figures increased when Bartol included the size of the department, scale K (correction), and scale 3 Hysteria (Hy) in addition to the Immaturity Index. Bartol found that 83% of officers predicted to succeed remained on the force and 77% of the officers predicted

not to succeed were terminated thus, using this approach, only 23% of those predicted to succeed were actually terminated and 17% of those predicted not to succeed actually remained on the force. Bartol (1991) concluded that the MMPI scale L (Lie), scale 4 Psychopathic Deviate (Pd), and scale 9 Hypomania (Ma) scales (Immaturity Index) demonstrated adequate predictive validity as these scales not only correlated well with supervisory ratings but also were able to distinguish officers who remained employed as peace officers from those who were terminated. Other studies have found different results related to the MMPI indexes and supervisory ratings of officers.

A more recent study by Davis, Rostow, Pinkston, Combs, and Dixon (2004) re-examined the MMPI-2's aggressiveness index developed by Bartol (1991) and the Immaturity Index developed by Hargrave, Hiatt, and Gaffney (1988). These authors hypothesized that there would be a relationship between Immaturity and Aggressive indices and supervisory ratings. Davis et al., originally sampled 1451 applicants, 1287 males and 164 females; however, many of those applicants were not hired due to issues related to the background investigation (e.g., drug use, traffic violations, felony convictions, dishonorable discharge, failing an exam, etc) and/or elevated MMPI-scores on scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 8 Schizophrenia (Sc), or scale 9 Hypomania (Ma). The sample used for their study included 925 officers which was about 91% of the original sample. The Immaturity Index was derived by summing the scores of scale L (Lie), scale 4 Psychopathic Deviate (Pd), and scale 9 Hypomania (Ma), whereas, the Aggressiveness Index was obtained from summing up the scores on the Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), and scale 9 (Ma) Hypomania and correlating them to supervisory ratings. These authors reported

Immaturity ratings to be positively related with termination from employment, difficulty completing training, insubordination, off-duty incidents, and chemical dependency. The Aggressiveness Index was also related to difficulty completing the training and termination from employment; these authors also noted that officers with higher Aggressiveness Index scores tended to experience more off-duty incidents, more suspensions, arrests, chemical dependency, and terminations due to insubordination and/or corruption.

Pre-employment Screenings

The psychological screening of job applicants in high-risk professions is conducted to assess suitability for hire, promotional suitability, and continued fitness-for-duty (Borum, Super, & Rand, 2003). At the pre-employment phase, the primary purpose is to determine if the individual is suitable to be a police officer. Suitability or fitness for a specific position requires the evaluation of an individual's personal capabilities in conjunction with the requirements of the job (Borum, Super, & Rand, 2003). Suitability has been assessed in part by examining psychological data (e.g., objective measures), behavioral history (e.g., deviant behavior-aggression or self-destruction, criminal history, substance and/or drug use, finances, relationships, driving record, previous employment behaviors) and the clinical interview (e.g., exploration of test elevations; Borum, Super, & Rand, 2003). Borum, Super, and Rand (2003) identified three levels of suitability that include: suitable, marginally suitable and unsuitable. A finding of suitability is indicative of no identifiable psychopathology and no behavioral problems or patterns, whereas, marginal suitability is indicative of possible symptoms of psychopathology, and/or some behavioral tendencies that

evidence the presence of a problem, and/or severity that is insufficient to disqualify an applicant (Borum, Super, & Rand, 2003). A recommendation of unsuitability in a pre-employment evaluation suggests the presence of significant symptoms of psychopathology and/or behavioral problems or patterns that would likely negatively impact performance as a peace officer (e.g., poor judgment, poor problem-solving skills, poor or inadequate communication, lack of integrity, lack of self-control, lack of dependability, lack of or too much assertiveness, inflexibility, lack of responsibility, and lack of courage etc; Borum, Super, & Rand, 2003; California POST, 2008). Pre-employment screenings attempt to identify those individuals who may have been at an increased risk of developing psychopathology, and/or who may have likely demonstrated inappropriate performance during stressful situations (e.g., officer involved shootings, altercations etc; Borum, Super, & Rand, 2003).

From a law enforcement standpoint, there are several reasons why agencies have shifted toward screening their employees prior to hire. These reasons include financial incentives (e.g., minimizing lawsuits; Lonsway et al., 2002), screening-out individuals with known psychopathology (Baker, 1995; Blau, 1994; CA POST, 2008; California Government Code, 2008; Hargrave & Berner, 1984), minimizing corruption (Arrigo & Claussen, 2003), eliminating the use of unjustified force (Castora, Brewster, & Stoloff, 2003) and overall hiring of officers who will perform the job well (Rubin, & Cruse, 1973; Pallone, 1992). These reasons are important given that law enforcement agencies can be held responsible for the actions of their employees (Flanagan, 1986; Bonsignore v. *City of New York*, 1982 as cited in Borum, Super, & Rand, 2003). Inevitably, however, there have been applicants who have been found unsuitable for hire and have

challenged the use of psychological screenings for the purposes of employment and have requested a copy of the psychological report (Super, 1997; Roulette v. Department of Central Management Services, 1987 as cited in Borum, Super, & Rand, 2003). Courts have ruled that law enforcement agencies have a right and a responsibility to screen their potential employees, that the psychologist does not have to release the psychological report to the applicant, but that screenings must be completed following an initial offer of employment so as to not violate the Americans with Disabilities act of 1990 (Borum, Super, & Rand, 2003; *McCabe v. Hoberman, 1969* and *Conte v. Horcher, 1977* as cited in Borum & Stock, 1993).

The Role of the Evaluator

The role of the evaluating psychologists in the selection of law enforcement applicants is important given that their recommendations impact the lives of thousands of individuals (e.g., the applicant, agency, and the community). Law enforcement psychologists must be competent clinicians, competent in psychological testing, knowledgeable of the requirements of the field for which they are conducting the assessments (e.g., job analysis), aware of the research on the specific population (e.g., police officers and pre-employment), know the limits of confidentiality, and have knowledge of pertinent state and federal legal issues that might impact the practice of psychology within the respective state (e.g., relationship between psychology and law; APA, 2002; Borum, Super, & Rand, 2003). Borum, Super, and Rand (2003) recommended that evaluators clearly delineate the limits of confidentiality and the purpose of the evaluation. For instance, evaluators should clearly distinguish between a pre-employment evaluation and individual therapy. Furthermore, these authors

suggested obtaining a signed informed consent that identifies the purpose of the evaluation, procedures to be used, intended use of the information, and employing law enforcement organization (Borum, Super, & Rand, 2003).

The California Commission on Peace Officer Standards and Training (POST) has stated that the recommendation of suitability for hire should be based on the psychological testing and the clinical interview (Hargrave & Berner, 1984). Hargrave and Berner (1984) have suggested two instances in which a clinical interview is necessary. First, a clinical interview is required when a recommendation of unsuitability based on mental or emotional grounds will be made (Hargrave & Berner, 1984). Second, a clinical interview is required when the results from the psychological testing have yielded inconclusive, invalid, or marginally valid results (Hargrave & Berner, 1984). According to these authors, it was not uncommon for applicants seeking employment to attempt to portray a positive image. Thus, it was important to meet face-to-face with the applicant, ask questions, conduct a mental status examination, and assess personality traits and characteristics in order to weed out psychologically or emotionally unfit applicants (Hargrave & Berner, 1984). The information obtained from the clinical interview in conjunction with information obtained from psychological testing (e.g., MMPI, CPI, Rorschach, Sentence Completion, etc), historical records (e.g., background investigations, polygraph results, family history, etc), and behavioral observations should inform the suitability decision (Dralle & Baybrook, 1985; Hargrave & Berner, 1984; Hartman, 1987; Hiatt & Hargrave, 1988; Crosby, 1979; McGinnis, 1987). In making these recommendations, Borum, Super, and Rand (2003) suggested that the information shared by the psychologist with the agency should be limited to

answering only the referral question and that unrelated information should be excluded from the report.

Although some researchers have criticized the clinical interview arguing that it lacks validity and reliability, many scholars have found psychologists to be quite competent in predicting suitability for employment (Hargrave & Berner, 1984; Hargrave, 1985; Hargrave & Hiatt, 1987; Hiatt & Hargrave, 1988; Hargrave & Hiatt, 1994). Hargrave and Berner (1984) examined the predictive validity of psychological evaluations on performance and concluded that psychologists were able to accurately classify about 70% of cadets using MMPI data. Another early study by Hargrave and Hiatt (1987) examined inter-rater reliability and validity in the assessment of law enforcement recruits. These authors reported a high clinician inter-rater reliability "on the basis of test or interview results or whether based upon combined test and interview data as it pertained to applicant suitability (Hargrave & Hiatt, 1987, p. 116)." A subsequent study by Hiatt and Hargrave (1988) evaluated the utility of psychological screenings to help predict performance among police officers who had been with the force approximately three years and were eligible to receive a supervisory performance evaluation from their department. These authors reviewed the psychological records of the officers [e.g., MMPI, CPI, Fundamental Interpersonal Relations Orientation-B (FIRO-B)] and found that out of the 55 officers selected for this study, 15 had been deemed unsuitable by the evaluator during the psychological screening but were nonetheless hired by the police department. The remaining officers were deemed suitable for hire. These authors found that psychologists were able to correctly classify suitability for employment 69% of the time, however, 24% of those who had been

found suitable had an unsatisfactory job performance, whereas, only 7% of those who were found unsuitable during the psychological evaluation had received a satisfactory performance evaluation. Hiatt and Hargrave (1988) found that officers who received a satisfactory performance evaluation scored lower on the MMPI scales suggesting better adjustment. The unsatisfactory group scored higher on scale 6 Paranoia (Pa), scale 9 Hypomania (Ma), scale K (correction), and scale 3 Hysteria (Hy). These findings suggested that pre-employment evaluations were useful in helping to predict suitability but they did not guarantee the identification of every problem employee (Borum, Super, & Rand, 2003).

Conclusion

Over the past several decades, the psychological screening process of police applicants has evolved from being virtually non-existent to being a standard practice among most law enforcement agencies. The psychological screening process can provide evaluators with useful information about the applicant's mental health and success as a police officer. In addition, the clinical interview was and continues to be an integral component of the psychological screening process. The clinical interview provides evaluators with an opportunity to meet face-to-face with job applicant's, obtain additional corroborating information, and facilitates the clarification of issues or concerns that emerge in the psychological testing. Importantly, the State of California Commission on Peace Officer Standards and Training (POST), law enforcement organizations, and the community alike have realized that much responsibility and authority is bestowed upon law enforcement officers to serve and protect the community, and as such, efforts should continue to be made to enhance the recruitment

and selection practices to ascertain that psychologically healthy individuals are selected into these important positions. The role of the evaluating psychologists in pre-employment evaluations is an important one given that their recommendations impact the individual, the agency and the community. Psychological testing has been used and continues to be used to assess the psychological characteristics of applicants. The MMPI-2 has been one of the most widely used objective personality measure in pre-employment evaluations. Researchers have examined the usefulness of the MMPI-2 to predict problematic behaviors (Weiss, Davis, Rostow, & Kinsman, 2003; Borum & Stock, 1993), job performance and officer misconduct (Hartman, 1987; Hargrave & Berner, 1984). Limited research exists, examining the extent to which the MMPI-2 predicts suitability for hire. Additional research is needed to assess whether profile differences exist between suitable and unsuitable law enforcement applicants by gender and within gender.

Purpose of Study

The purpose of this study was to examine the usefulness of the Minnesota Multiphasic Personality Inventory-II (MMPI-2) in the selection of law enforcement applicants. Specifically, to examine the extent to which suitability could be predicted by the MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). This study examined profile differences in suitability across gender, between gender, and within gender for both male and female applicants. This study included an exploratory profile analysis of female applicants by suitability.

Hypotheses

Profile differences were predicted by suitability. Suitability (suitable, unsuitable) was predicted by the MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma).

Hypothesis 1. It was hypothesized that profile differences would emerge for the unsuitable and suitable combined gender. The unsuitable combined gender would show higher elevations on the following scales in comparison to the suitable male applicants: MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma).

Hypothesis 2. It was hypothesized that profile differences would emerge for the unsuitable and suitable males. The unsuitable males would show higher elevations on the following scales in comparison to the suitable male applicants: MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma).

Hypothesis 3. It was hypothesized that profile differences would emerge for the unsuitable and suitable females. The unsuitable females would show higher elevations on the following scales in comparison to the suitable female applicants on the MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). On Scale 5 (Mf) Masculinity-Femininity female

applicants who were deemed suitable would exhibit higher scale elevations in comparison to the females who were deemed unsuitable for hire.

Hypothesis 4. It was hypothesized that profile differences would emerge for the female and male applicants on the MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). On Scale 5 (Mf) Masculinity-Femininity female applicants would exhibit higher scale elevations, whereas, male applicants would show lower scores on Scale 5 (Mf) Masculinity-Femininity.

Method

Participants

The data used in this study was archival and consisted of pre-employment psychological evaluations of applicants who applied to a law enforcement agency for the position of sworn peace officer within the state of California. These applicants applied to a law enforcement agency within Riverside, San Bernardino, or Los Angeles County. The psychological evaluations of the applicants in this study were conducted between July 1998 and June 2009.

A total of N=1,264 records were reviewed. A total of 17 cases were excluded from the analysis because one or more of the MMPI-2 scale scores was 3.5 standard deviations or greater than the average scale score. Of those excluded, 13 cases were from applicants who had been found suitable for hire (10 males, 3 females), and 4 cases were applicants found unsuitable for hire (4 males). A total of N= 1,247 cases were used in this analysis. Of the cases reviewed, 95.4% (n=1,190) were suitable applicants, and 4.6% (n=57) were unsuitable applicants. A total of 88.5% (n=1,104) were male, and 11.5 % (n= 143) were female. In the suitable group, a total of 88.5% (n=1,053) were male, and 11.5% (n=137) were females. In the unsuitable group, a total of 89.5% (n=51) were males, and 10.5% (n=6) were females.

In the suitable group, participants ranged in age from 20 to 61 (M=29.71, SD= 7.09). In the suitable group, the average age for males was 29.63 (SD=6.99), and the average age for females was 28.97 (SD=7.07). In the unsuitable group, participants ranged in age from 20 to 56 (M=32.97, SD= 8.21). In the unsuitable group, the average

age for males was 33.44 (SD=8.45), and the average age for females was 29.00 (SD=4.47).

Measures

Minnesota Multiphasic Personality Inventory-II (MMPI-2): The MMPI-2 (Butcher et al., 1989; Hathaway & McKinley, 1983) was a widely used objective measure that assessed both general personality and psychological functioning in individuals ages 18 and older. The MMPI-2 included 10 basic scales {scale 1 (Hs), scale 2 (D), scale 3 (Hy), scale 4 (Pd), scale 5 (Mf), scale 6 (Pa), scale 7 (Pt), scale 8 (Sc), scale 9 (Ma), & scale 0 (Si)} and 3 basic validity scales L (Lie), F (Infrequency), and K (correction) meant to assess the reliability of the individual's response with regard to true psychological functioning. The MMPI-2 consisted of 567 statements to which the individual responds either true or false. Scores were given in a T-score format, with a mean of 50 and a standard deviation of 10 (Green, 2000). Scores were considered to be clinically significant if they were 1.5 standard deviations above the mean (T>65). The MMPI-2 has moderate to very high test-retest reliability coefficients ranging .67-.92 for males and .58 to .91 for females (Butcher et al., 1989). The MMPI-2 profile for basic scales was be used in this study and the raw scores were converted to t-scores.

Procedure

The data consisted of archival psychological evaluation records that were collected by a licensed clinical psychologist. A total of N=1,264 cases were reviewed and the following information was extrapolated from the reports: (a) the MMPI-2 raw

scores of the 10- basic scales, (b) demographic information including age, gender, date of psychological evaluation, and suitability for hire. The MMPI-2 raw scores were converted to standard T-scores using the K-correction norms reported by Greene (2000).

The data was screened for sample size, missing data, and outliers. The suitable and unsuitable groups had unequal sample size by suitability. According to Tabachnick and Fidell (2001), when there is only one between-subjects independent variable in a multivariate analysis of variance (MANOVA), it adjusts for unequal sample size. In addition, there were more cases than dependent variables. The data was screened for outliers. A total of 17 cases were deleted from the original sample because one or more of the MMPI-2 scales was 3.5 standard deviations or greater from the mean. Thirteen of the excluded cases were suitable for hire and four were not suitable for hire. Two additional cases were excluded from the analysis because of missing data on one or more of the MMPI-2 scales. Homogeneity of Variance-Covariance matrices was not met, Box's M was significant, p=.000, equal variances could not be assumed. However, the variance of each of the scales {scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma)} by suitability (suitable & unsuitable) was within a ratio of 2.5:1 for each MMPI-2 scale. After the deletion of cases with missing data and outliers, assumptions regarding normality of sampling distributions, homogeneity of variance-covariance matrices, linearity, and multicollinearity were met.

Predictive Analytics SoftWare (PASW, formally known as SPSS) GLM was used for the analysis. A profile analysis was performed on a total of 7 subscales of the MMPI-2. These scales were as follow: MMPI-2 validity scales L (Lie), Infrequency (F) scale, and scale K (correction) and four of the MMPI-2 basic scales 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). The grouping variable, suitability for hire: (a) suitable and (b) unsuitable was dichotomous. A profile analysis was conducted by suitability across gender (both males and females), by suitability for males only, by suitability for females only (exploratory), and by gender for MMPI-2 scale L (Lie), scale K (correction), Infrequency scale (F), scale 4 Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma). The profiles were tested for the parallelism assumption, to determine similarities and group differences (interaction effect) in scale scores between the suitable and unsuitable applicants. The levels hypotheses was also tested to assess overall differences by suitability, specifically, to assess if the unsuitable group would have higher scale elevations in comparison to the suitable group. If the profiles were parallel, the flatness hypothesis was tested to determine similarity across groups on scale scores of the MMPI-2. Wilks' Lambda was used to calculate the proportion of variance explained.

A binary logistic regression was used to predict suitability classification by selected MMPI-2 scales that were found to be significant in the profile analysis for the combined group only. Logistic regression was used to predict the categorical outcome of suitability (suitable v. unsuitable) by predictor scales using PASW. The Chi-Square test was reported to specify overall model fit.

Results

Individual Scale Analysis

Table 2 shows the mean, standard deviation, and the variance for MMPI-2 scale L (Lie), Infrequency scale (F), scale K (correction), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma) for the suitable and unsuitable applicants. Scale L (Lie) had the most amount of average variability relative to all scales but was similar across suitability.

Table 2

Group Means by Suitability

MMPI-2	*N*	*Mean*	*SD*	*Variance*
Suitable Group				
L (Lie)	1190	65.69	12.04	145.02
F (Infrequency)	1190	42.55	4.21	17.75
K (K-correction)	1190	64.87	6.54	42.74
Scale 4 (Pd)	1190	51.77	6.41	41.14
Scale 6 (Pa)	1189	46.82	6.84	46.84
Scale 7 (Pt)	1189	47.51	5.37	28.81
Scale 9 (Ma)	1190	49.04	6.17	38.07
Unsuitable Group				
L (Lie)	57	62.30	10.11	102.28
F (Infrequency)	57	44.56	5.22	27.25
K (K-correction)	57	64.44	8.75	76.57
Scale 4 (Pd)	57	56.67	9.00	81.05
Scale 6 (Pa)	57	47.47	7.90	62.47
Scale 7 (Pt)	57	48.05	7.17	51.44
Scale 9 (Ma)	57	50.11	7.50	56.31

Table 3

MMPI-2 Gender Group Means

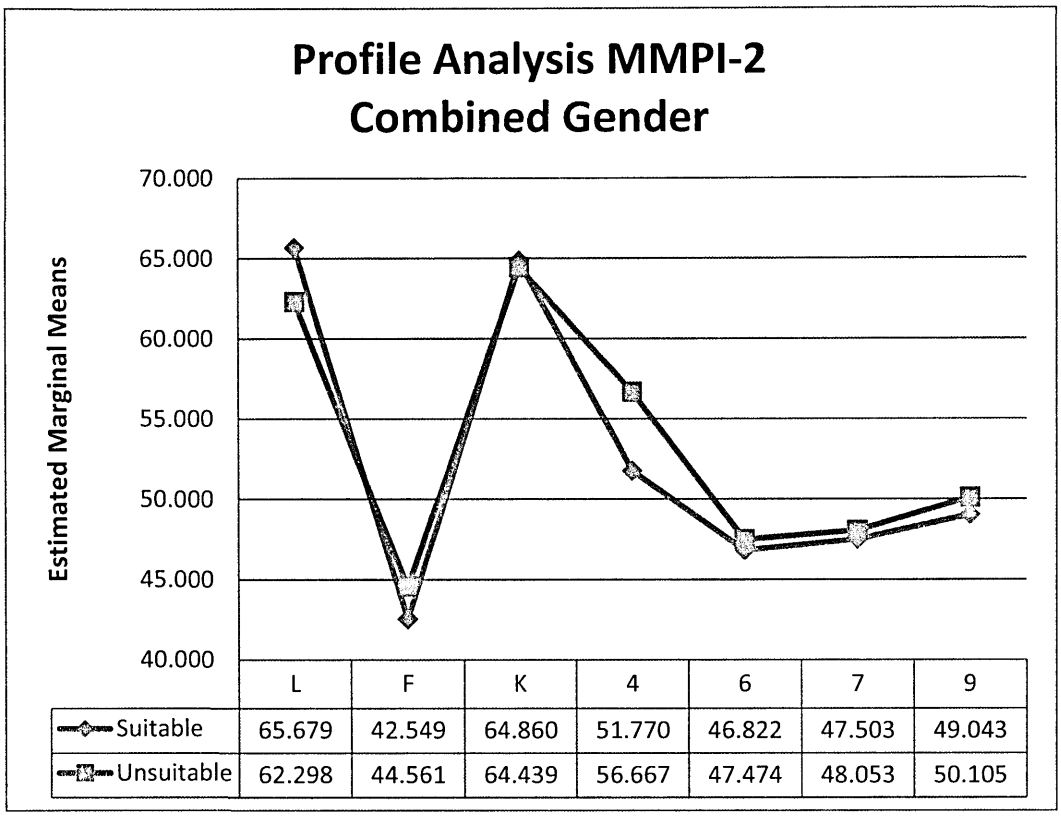
MMPI-2		*N*	*Mean*	*SD*
L (Lie)	Male	1015	65.69	11.81
	Female	142	64.76	13.44
F (Infrequency)	Male	1015	42.40	4.07
	Female	142	44.92	5.15
K (K-correction)	Male	1015	64.89	6.63
	Female	142	65.80	6.48
Scale 4 (Pd)	Male	1015	51.96	6.65
	Female	142	53.53	6.71
Scale 5 (MF)	Male	1015	39.31	6.15
	Female	142	65.85	9.24
Scale 6 (Pa)	Male	1015	47.42	6.79
	Female	142	44.85	6.30
Scale 7 (Pt)	Male	1015	47.86	5.33
	Female	142	45.87	6.04
Scale 9 (Ma)	Male	1015	49.03	6.28
	Female	142	49.70	6.36

Table 3 shows the mean, standard deviation, and the variance for MMPI-2 scale L (Lie), Infrequency scale (F), scale K (correction), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and scale 9 Hypomania (Ma) for males and females. Scale L (Lie) had the most amount of average variability relative to all scales with the female group exhibiting the greatest amount of variability. In scale 5

Masculinity-Femininity (Mf), females had a lower mean in comparison to male applicants.

Profile Analysis: Suitable (Combined Gender) & Unsuitable (Combined Gender)

The hypothesis that scores on the MMPI-2 scales L (Lie), Infrequency scale (F), scale K (correction), 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and 9 Hypomania (Ma) differed for both male and female applicants as a function of suitability was tested (see Profile Plot A). Using Wilks' criterion, the profiles deviated significantly from parallelism, f (6, 1,245) = 7.004, p = .000, partial n^2 = .033. There were statistically significant differences between the suitable and unsuitable groups. The flatness hypothesis was irrelevant in this analysis given that the profiles deviated from parallelism. For the levels test, no statistically significant differences were found among the suitable and unsuitable groups when scores were averaged over the seven MMPI-2 subscales, f (1, 1243) = 2.228, p= .136, n^2 = .002.



Profile Analysis: Wilks' criterion, f (6, 1,245) = 7.004, p = .000, partial n^2 = .033, parallelism, Levels hypothesis p > .05, flatness hypothesis irrelevant.

Figure 1. Profile Plot A: Suitability for Combined Gender

To assess deviation from parallelism of the profiles, confidence intervals were calculated around the mean of the profiles for the suitable and unsuitable groups (see Table 4). Ninety-five percent confidence intervals were evaluated for the pooled profile and compared to the average score of each suitability condition. For two of the MMPI-2 validity scales and one basic scale, the means of the suitable or unsuitable groups had means that fell outside of the 95% confidence intervals. On scale F (Infrequency), the suitable group had a lower mean (M= 42.549) than that of the pooled groups, whereas, the unsuitable group had a higher mean (M= 44.561) than that of the pooled groups (where the 95% confidence limits were 42.998 to 44.122). On scale L (Lie), the

Table 4

MMPI-2 Combined Gender: 95% Confidence Intervals for Profile Analysis

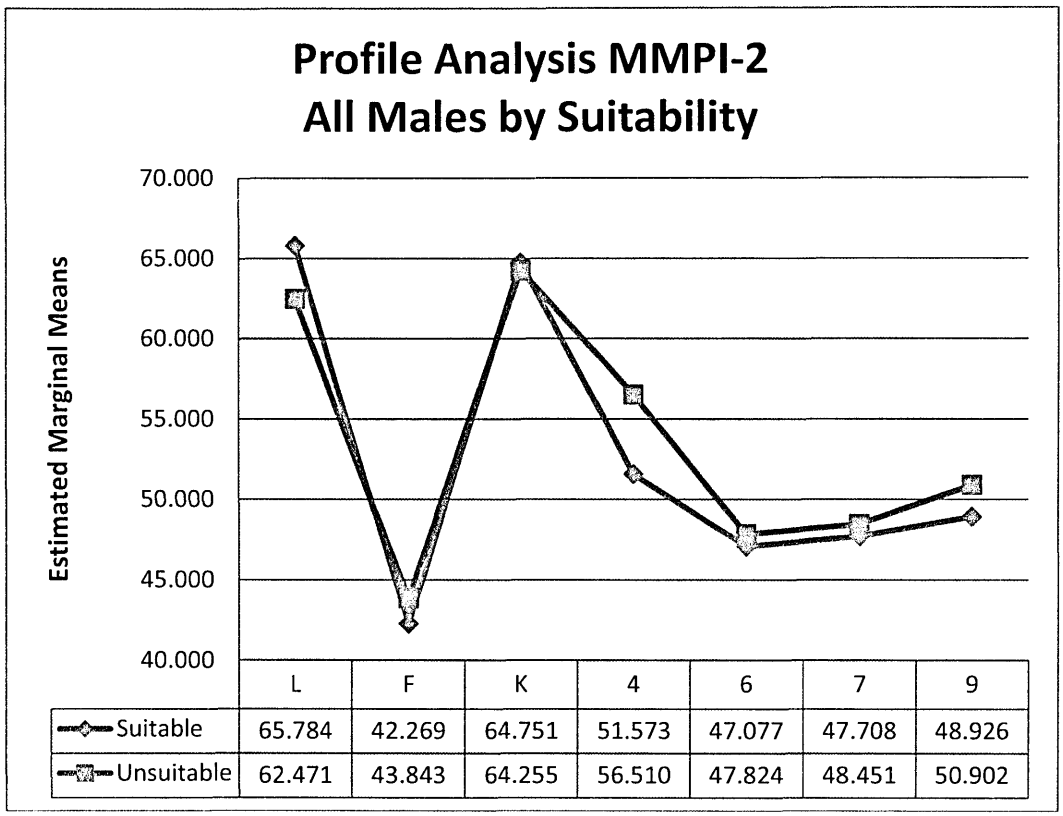
MMPI-2	*Mean*	*95% Confidence Interval*	
		Lower Bound	Upper Bound
Pooled Means			
L (Lie)	63.98	62.39	65.58
F (Infrequency)	43.56	42.99	44.12
K (K-correction)	64.65	63.76	65.54
Scale 4 (Pd)	54.22	53.35	55.09
Scale 6 (Pa)	47.15	46.23	48.07
Scale 7 (Pt)	47.78	47.05	48.50
Scale 9 (Ma)	49.57	48.74	50.40
Suitable Group			
L (Lie)	65.68	64.99	66.36
F (Infrequency)	42.55	42.31	42.79
K (K-correction)	64.86	64.48	65.24
Scale 4 (Pd)	51.77	51.40	52.14
Scale 6 (Pa)	46.82	46.43	47.21
Scale 7 (Pt)	47.50	47.19	47.81
Scale 9 (Ma)	49.04	48.69	49.40
Unsuitable Group			
L (Lie)	62.30	59.19	65.40
F (Infrequency)	44.56	43.45	45.67
K (K-correction)	64.44	62.71	66.17
Scale 4 (Pd)	56.67	54.97	58.37
Scale 6 (Pa)	47.47	45.68	49.27
Scale 7 (Pt)	48.05	46.63	49.47
Scale 9 (Ma)	50.10	48.48	51.73

suitable group had a higher mean (M=65.679) than that of the pooled groups, whereas, the unsuitable group had a lower mean (M= 62.298) than that of the pooled groups (where the 95% confidence limits were 62.399 to 65.579). On the basic scale 4 (Pd), the

suitable group had a lower mean (M=51.770) than that of the pooled groups, whereas, the unsuitable group had a higher mean (M=56.667) than that of the pooled groups (where the 99.9% confidence limits were 53.073 to 55.364).

Profile Analysis: Suitable Males & Unsuitable Males

The hypothesis that scores on the MMPI-2 scales L (Lie), Infrequency scale (F), scale K (correction), 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and 9 Hypomania (Ma) differed for male applicants as a function of suitability was tested (see Profile Plot B). Using Wilks' criterion, the profiles deviated significantly from parallelism, f (6, 1095) = 6.367, p = .000, partial n^2 = .034. There were statistically significant differences between the suitable and unsuitable groups. The flatness hypothesis was also irrelevant in this analysis given that the profiles deviated from parallelism. For the levels test, no statistically significant differences were found among the suitable and unsuitable groups when scores were averaged over the seven MMPI-2 subscales, f (1, 1102) = 2.693, p= .101, partial n^2 = .002.



Profile Analysis: Wilks' criterion, f (6, 1095) = 6.367, p = .000, partial n^2 = .034, parallelism, Levels hypothesis p > .05, flatness hypothesis irrelevant.

Figure 2. Profile Plot B: Suitability for Males

To assess deviation from parallelism of the profiles, confidence intervals were calculated around the mean of the profiles for the suitable males and unsuitable males (see Table 5). Ninety-five percent confidence intervals were evaluated for the pooled profile. For two of the MMPI-2 validity scales and two of the basic scales, the means of the suitable or unsuitable groups had means that fell outside of these limits. On scale L (Lie), the suitable group had a higher mean (M= 65.784) than that of the pooled groups, whereas, the unsuitable group had a lower mean (M= 62.471) than that of the pooled groups (where the 95% confidence limits were 62.473 to 65.781). On scale F

Table 5

MMPI-2 Males: 95% Confidence Intervals for Profile Analysis

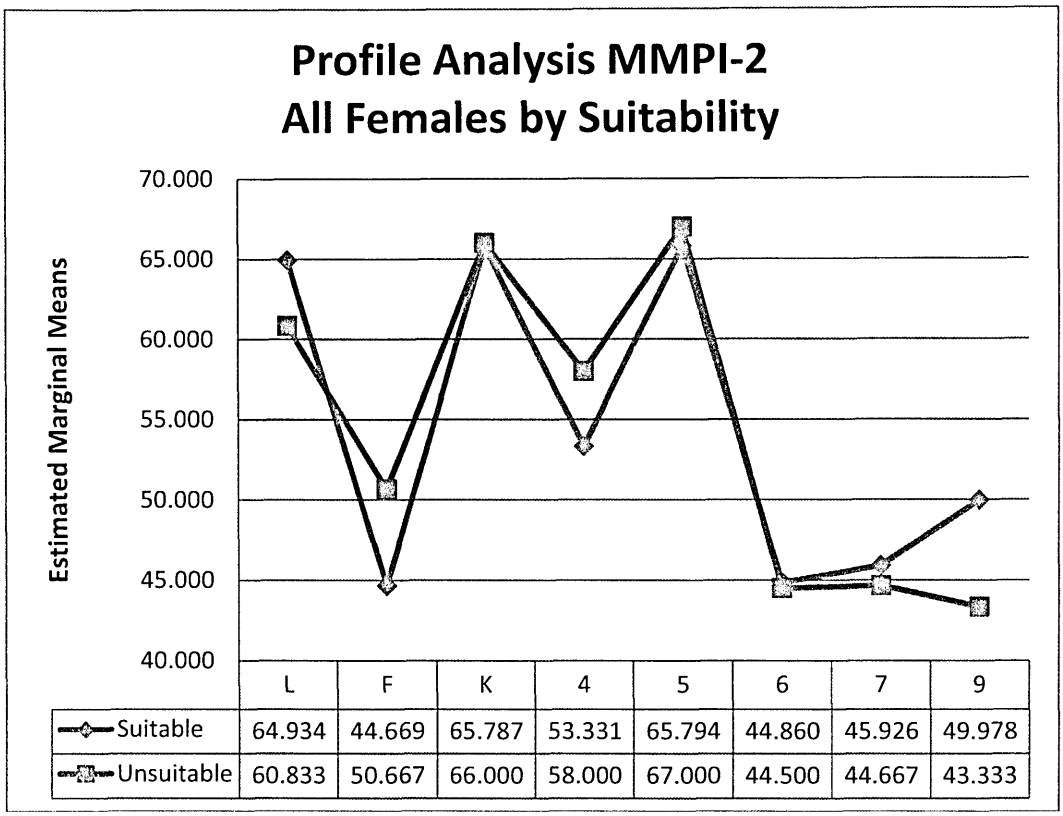
MMPI-2	*Mean*	*95% Confidence Interval*	
		Lower Bound	Upper Bound
Pooled Means			
L (Lie)	64.13	62.47	65.78
F (Infrequency)	43.06	42.49	43.63
K (K-correction)	64.50	63.57	65.44
Scale 4 (Pd)	54.04	53.13	54.96
Scale 6 (Pa)	47.45	46.48	48.43
Scale 7 (Pt)	48.08	47.33	48.83
Scale 9 (Ma)	49.91	49.04	50.79
Suitable Males			
L (Lie)	65.78	65.07	66.50
F (Infrequency)	42.27	42.02	42.52
K (K-correction)	64.75	64.35	65.15
Scale 4 (Pd)	51.57	51.18	51.97
Scale 6 (Pa)	47.08	46.66	47.50
Scale 7 (Pt)	47.71	47.39	48.03
Scale 9 (Ma)	48.93	48.55	49.30
Unsuitable Males			
L (Lie)	62.47	59.24	65.70
F (Infrequency)	43.84	42.73	44.96
K (K-correction)	64.26	62.42	66.09
Scale 4 (Pd)	56.51	54.72	58.30
Scale 6 (Pa)	47.82	45.92	49.73
Scale 7 (Pt)	48.45	46.98	49.93
Scale 9 (Ma)	50.90	49.20	52.61

(Infrequency), the suitable group had a lower mean (M= 42.269) than that of the pooled groups, whereas, the unsuitable group had a higher mean (M=43.843) than that of the pooled groups (where the 95% confidence limits were 42.486 to 43.627). On scale 4

(Pd), the suitable group had a lower mean (M= 51.573) than that of the pooled groups, whereas, the unsuitable group had a higher mean (mean= 56.510) than that of the pooled groups (where the 95% confidence limits were 53.125 to 54.958). On scale 9 (Ma), the suitable group had a lower mean (M=48.926) than that of the pooled groups, whereas, the unsuitable group had a higher mean (M= 50.902) than that of the pooled groups (where the 95% confidence limits were 49.040 to 50.788).

Exploratory Profile Analysis: Suitable Female & Unsuitable Female

The exploratory hypothesis that scores on the MMPI-2 scales L (Lie), Infrequency scale (F), scale K (correction), 4 Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and 9 Hypomania (Ma) differed for female applicants as a function of suitability was tested (see Profile Plot C). Using Wilks' criterion, the profiles deviated significantly from parallelism, f (7, 143) = 2.847, p = .008, partial n^2 = .129. There were statistically significant differences between the suitable females and the unsuitable females. The flatness hypothesis was also irrelevant in this analysis given that the profiles deviated from parallelism. For the levels test, no statistically significant differences were found among the suitable females and unsuitable females when scores were averaged over the MMPI-2 subscales, f (1, 143) = .000, p= .983, partial n^2 = .000.



Profile Analysis: Wilks criterion, f (7, 143) = 2.847, p = .008, partial n^2 = .129, parallelism, Levels hypothesis p >.05, flatness hypothesis irrelevant.

Figure 3. Profile Plot C: Suitability for Females

To assess deviation from parallelism of the profiles, confidence intervals were calculated around the mean of the profiles for the suitable and unsuitable groups (see Table 6). Ninety-five percent confidence intervals were evaluated for the pooled profile. For the female suitable and unsuitable groups, one MMPI-2 validity scale and one basic scale had a mean that fell outside of these limits. On scale F (Infrequency), the suitable group had a lower mean (M= 44.669) than that of the pooled groups, whereas, the unsuitable group had a higher mean (M= 50.667) than that of the pooled groups (where the 95% confidence interval were 45.596 to 49.740). On scale 9 (Ma), the suitable

Table 6

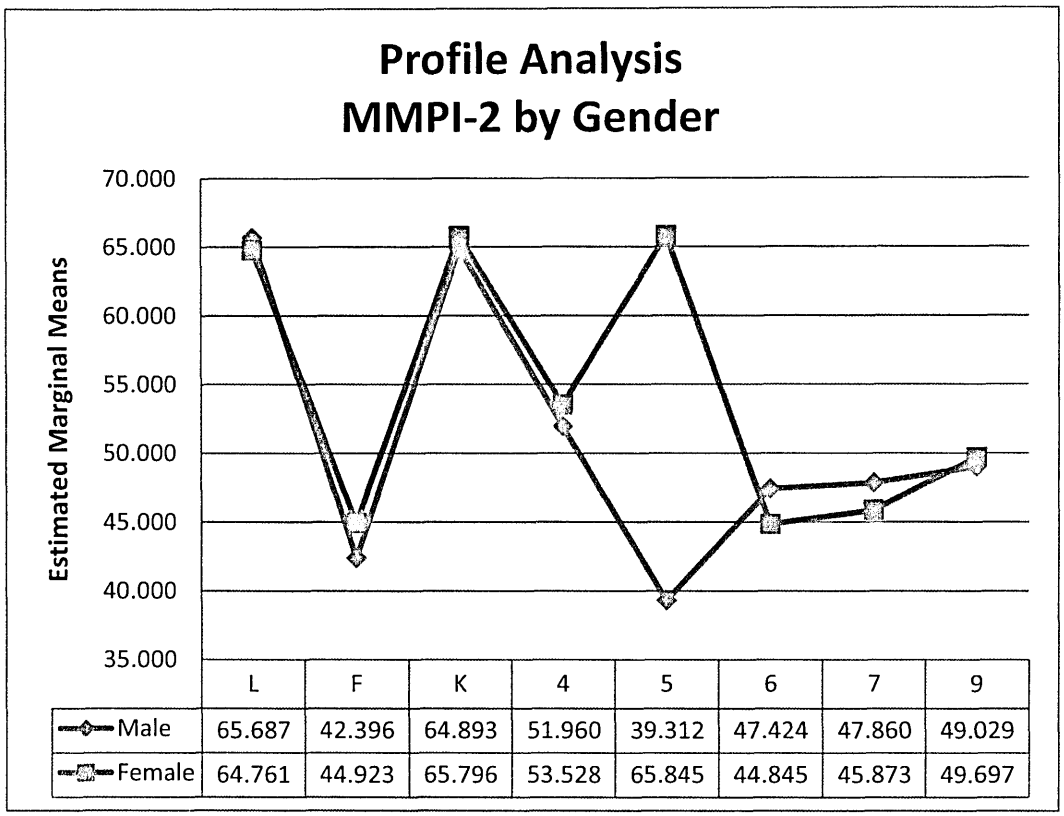
MMPI-2 Females: 95% Confidence Intervals for Profile Analysis

MMPI-2	*Mean*	*95% Confidence Interval*	
		Lower Bound	Upper Bound
Pooled Means			
L (Lie)	62.88	57.33	68.44
F (Infrequency)	47.67	45.60	49.74
K (K-correction)	65.89	63.21	68.58
Scale 4 (Pd)	55.67	52.92	58.42
Scale 5 (Mf)	66.40	62.58	70.22
Scale 6 (Pa)	44.68	42.07	47.29
Scale 7 (Pt)	45.30	42.80	47.80
Scale 9 (Ma)	46.66	44.09	49.23
Suitable Females			
L (Lie)	64.93	62.65	67.22
F (Infrequency)	44.67	43.82	45.52
K (K-correction)	65.79	64.68	66.89
Scale 4 (Pd)	53.33	52.20	54.46
Scale 5 (Mf)	65.79	64.22	67.37
Scale 6 (Pa)	44.86	43.79	45.93
Scale 7 (Pt)	45.93	44.90	46.95
Scale 9 (Ma)	49.98	48.92	51.04
Unsuitable Females			
L (Lie)	60.83	49.97	71.70
F (Infrequency)	50.68	46.61	54.72
K (K-correction)	66.00	60.75	71.25
Scale 4 (Pd)	58.00	52.62	63.38
Scale 5 (Mf)	67.00	59.52	74.48
Scale 6 (Pa)	44.50	39.39	49.61
Scale 7 (Pt)	44.67	39.78	49.56
Scale 9 (Ma)	43.33	38.30	48.37

group had a higher mean (M= 49.978) than that of the pooled groups, whereas, the unsuitable group had a lower mean (M= 43.333) than that of the pooled groups (where the 95% confidence interval were 44.085 to 49.227).

Profile Analysis: Exploratory By Gender for MMPI-2 scales

The exploratory hypothesis that scores on the MMPI-2 scales L (Lie), Infrequency scale (F), scale K (correction), 4 Psychopathic Deviate (Pd), scale 5 Masculinity-Femininity (Mf), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), and 9 Hypomania (Ma) differed as a function of gender was tested (see Profile Plot D). Using Wilks' criterion, the profiles deviated significantly from parallelism, f (7, 1245) = 281.890, p = .000, partial n^2 = .632. There were statistically significant differences between male and female applicants. The flatness hypothesis was also irrelevant in this analysis given that the profiles deviated from parallelism. For the levels test, statistically significant differences were found between the male and female applicants when scores were averaged over the three MMPI-2 validity scales and 4 basic subscales, f (1, 1157) = 115.011, p= .000, partial n^2 = .091. On average female applicants scored higher than males on scale F (Infrequency; M= 44.923), scale 4 (Pd; M=53.528), scale 5 (MF; M=65.845), scale 6 (Pa; M=44.845); males scored lower on scales F (Infrequency; M= 42.396), scale 4 (Pd; M=51.960), scale 5 (MF; M=39.312), scale 6 (Pa; M=47.424). Scale 5 (MF), accounted for n^2 = .635, proportion of variance explained.



	L	F	K	4	5	6	7	9
Male	65.687	42.396	64.893	51.960	39.312	47.424	47.860	49.029
Female	64.761	44.923	65.796	53.528	65.845	44.845	45.873	49.697

Profile Analysis: Wilks' criterion, f (7, 1245) = 281.890, p = .000, partial n^2 = .632, parallelism. Test of between subjects effect, levels hypothesis, f (1, 1157) = 115.011, p= .000, partial n^2 = .091; Flatness hypothesis irrelevant.

Figure 4. Profile Plot D: MMPI-2 by Gender

To assess deviation from parallelism of the profiles, confidence intervals were calculated around the mean of the profiles for the male and female applicants (see Table 7). Ninety-five percent confidence intervals were evaluated for the pooled profile. For the male and female groups, one MMPI-2 validity scale and four basic scales had means that fell outside of the 95% limits. On scale F (Infrequency), males had a lower mean (M= 42.396) than that of the pooled groups, whereas, the females had a higher mean (M= 44.923) than that of the pooled groups (where the 95% confidence interval were

Table 7

MMPI-2 by Gender: 95% Confidence Intervals for Profile Analysis

MMPI-2	*Mean*	*95% Confidence Interval*	
		Lower Bound	Upper Bound
Pooled Means			
L (Lie)	65.22	64.17	66.28
F (Infrequency)	43.66	43.29	44.03
K (K-correction)	65.34	64.76	65.93
Scale 4 (Pd)	52.74	52.16	53.33
Scale 5 (Mf)	52.58	52.00	53.16
Scale 6 (Pa)	46.13	45.54	46.73
Scale 7 (Pt)	46.87	46.39	47.34
Scale 9 (Ma)	49.36	48.81	49.92
Males			
L (Lie)	65.69	64.95	66.43
F (Infrequency)	42.40	42.14	42.66
K (K-correction)	64.89	64.48	65.30
Scale 4 (Pd)	51.96	51.55	52.37
Scale 5 (Mf)	39.31	38.91	39.72
Scale 6 (Pa)	47.42	47.01	47.84
Scale 7 (Pt)	47.86	47.53	48.19
Scale 9 (Ma)	49.03	48.64	49.42
Females			
L (Lie)	64.76	62.78	66.74
F (Infrequency)	44.93	44.23	45.62
K (K-correction)	65.80	64.71	66.89
Scale 4 (Pd)	53.53	52.43	54.63
Scale 5 (Mf)	65.85	64.76	66.93
Scale 6 (Pa)	44.85	43.74	45.95
Scale 7 (Pt)	45.87	44.98	46.77
Scale 9 (Ma)	49.70	48.66	50.73

43.289 to 44.030). On scale 4 (Pd), male applicants had a lower mean (M= 51.960) than that of the pooled groups, whereas, female applicants had a higher mean (M= 53.528) than that of the pooled groups (where the 95% confidence limits were 52.159 to 53.329). On scale 5 (MF), males had a lower mean (M=39.312) than that of the pooled groups, whereas, females had a higher mean (M=65.845) than that of the pooled groups (where the 95% confidence interval were 51.998 to 53.159). On scale 6 (Pa), males had a higher mean (M=47.424) than that of the pooled groups, whereas, females had a lower mean (M=44.845) than that of the pooled groups (where the 95% confidence interval were 45.542 to 46.726). On scale 7 (Pt), males had a higher mean (M= 47.860) than that of the pooled groups, whereas, females had a lower mean (M=45.873) than that of the pooled groups (where the 95% confidence limits were 46.390 to 47.343).

Binary Logistic Regression: Suitability (Combined Gender)

A binary logistic regression was used to predict suitability classification by selected MMPI-2 scales that were found to be significant in the profile analysis (see Table 8). MMPI-2 scale differences emerged on scale F (Infrequency) and scale 4 (Pd; Psychopathic deviate). Logistic regression was used to predict the categorical outcome of suitability (suitable v. unsuitable) by predictors scale F (Infrequency) and scale 4 (Pd) using the Predictive Analytics SoftWare (PASW, formally known as SPSS). Chi-Square tests indicated the overall model fit the data and the MMPI-2 validity scale L (Lie), Infrequency scale (F), and basic scale 4 Psychopathic Deviate (Pd) significantly predicted suitability $\chi^2(3) = 37.701, p = .000$.

Table 8

Logistic Regression

MMPI-2	*B*	*Wald Test (z-ratio)*	*Exp (B)*	*95% Confidence Interval for Odds Ratio*	
				Lower	*Upper*
Scale F (Infrequency)	.068	*5.263*	1.071	1.010	1.135
Scale L (Lie)	-.025	4.452	.975	.952	.998
Scale 4 (Pd)	-9.382	19.900	1.097	1.053	1.142

Note: Logistic regression for scale F (Infrequency), scale L (Lie), and scale 4 (Pd). Overall model fitness, χ^2 (3) = 37.701, p = .000.

The variables in the model, scale L (Lie), Infrequency scale (F), and scale 4 Psychopathic Deviate (Pd) were able to predict group membership with a hit rate of 95.5%. Successful prediction was accomplished in the suitable group, with 100% of suitable applicants being correctly predicted. However, the prediction of the unsuitable applicants was unimpressive, with only 1.8% (n=1) of unsuitable applicants being correctly predicted as unsuitable for hire. According to Nagelkerke R Squared the model accounted for 9.6% of the variance in suitability. According to the Wald criterion, scale 4 (Pd), z= 19.900, p=.000 reliably predicted suitability as did scale F (Infrequency), z=5.263, p=.022, and scale L (Lie), z=4.452, p.035. Results indicated that scale 4 (Pd) contributed to higher odds of suitability Exp (B) =1.097 (95% C.I for Exp (B) 1.053 to 1.142). Similarly, scale F (Infrequency) contributed to higher odds of suitability Exp (B) =1.071 (95% C.I for Exp (B) 1.053 to 1.142). Scale L (Lie) contributed to an odd ratio of Exp (B) = .975 (95% C.I for Exp (B) 1.053 to 1.142).

These findings highlight that scale F (Infrequency), scale L (Lie) and scale 4 (Pd) contribute to suitability but only for the suitable applicants.

Post hoc Qualitative Profile Comparisons

The data from this study was compared to Butcher's (2001) norms. Butcher's (2001) MMPI-2 non-gendered norms were plotted with the combined gender profiles of the suitable and unsuitable applicants (see Profile E). In comparison to Butcher's non-gendered norms, both the suitable and unsuitable applicants (combined gender) had higher average scores on scale K (correction), and scale L (Lie). Butcher's norms were also higher on scale 9 Hypomania (Ma). Butcher's (2001) male MMPI-2 norms were plotted with the suitable and unsuitable male data (see Profile F). In comparison to Butcher's male norms, both the suitable and unsuitable males had higher average scale elevations on scale L (Lie) and scale K (correction). Butcher's (2001) female norms were plotted with suitable and unsuitable female data (see Profile G). In comparison to Butcher's female norms, the suitable females showed higher average score on scale L (Lie) and scale K (correction), scale 4 Psychopathic Deviate (Pd), and scale 5 Masculinity-Femininity (Mf), and lower on scale 6 Paranoia (Pa). Butcher's (2001) MMPI-2 gender norms were plotted with this study's male and female data (see Profile H). In comparison to Butcher's female norms, the female applicants in this study had higher average scores on scale 5 Masculinity-Femininity (Mf) in comparison to male norms and males in this study.

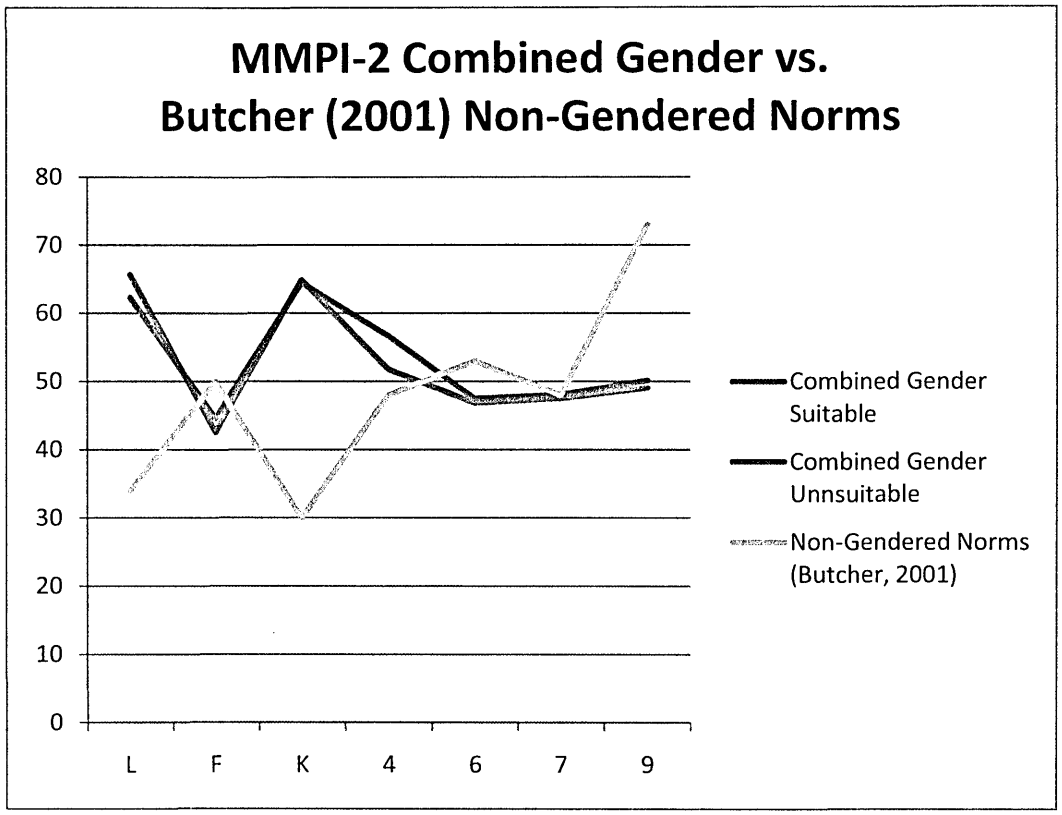


Figure 5. Profile E: Comparison Butcher (2001) Non-Gendered Norms with Combined Gender by Suitability.

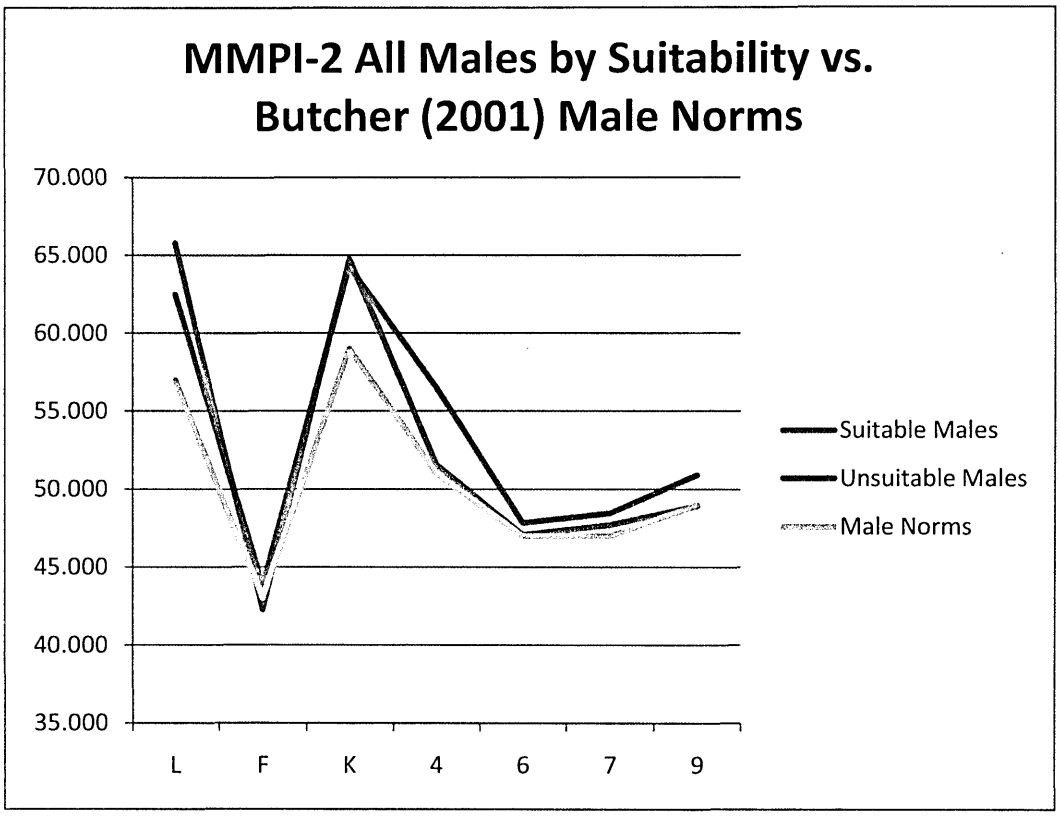


Figure 6. Profile F: Comparison Butcher (2001) Male Norms with Males by Suitability

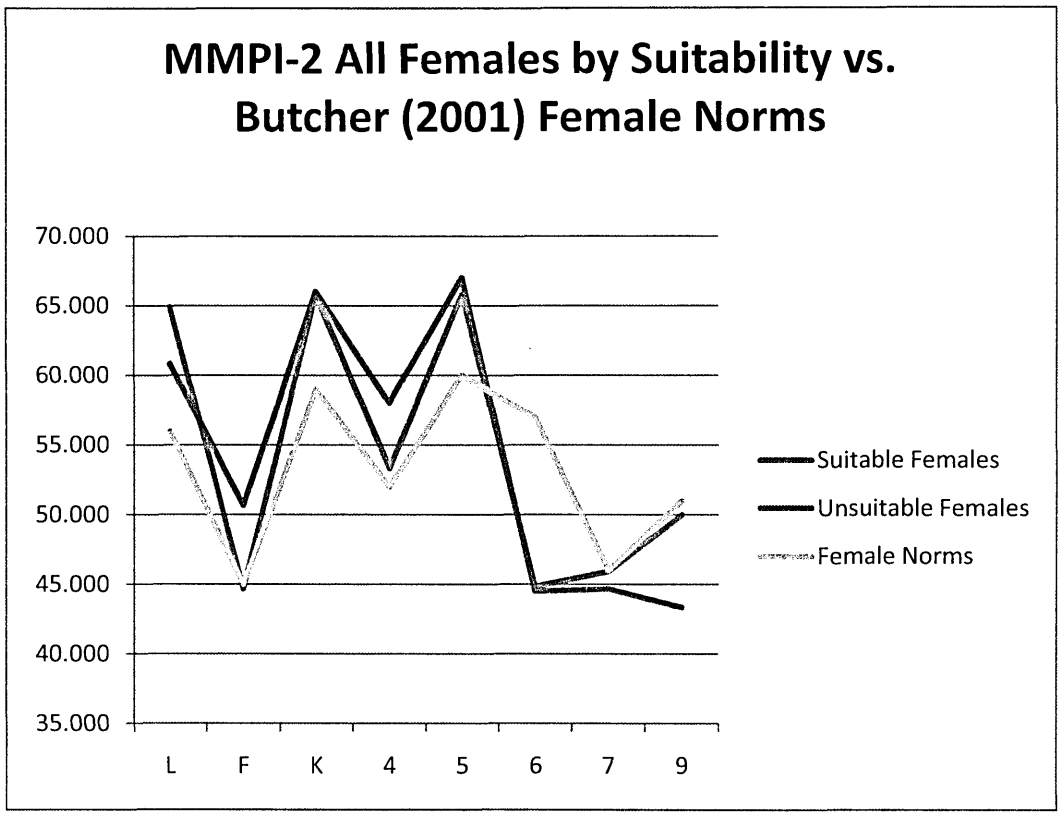


Figure 7. Profile G: Comparison Butcher (2001) Female Norms with Females by Suitability.

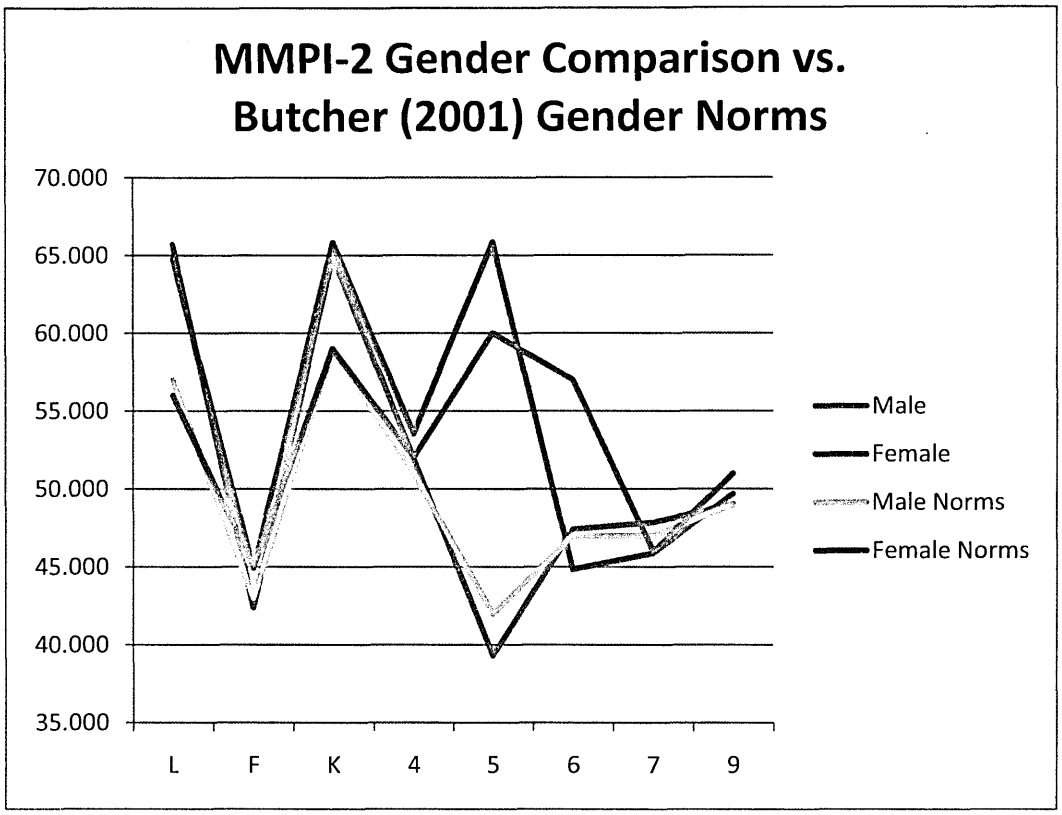


Figure 8. Profile H: Gender Comparison & Butcher (2001) Gender Norms

A post hoc individual scale analysis using Graham (2006) and Greene (2000) criterions was developed to examine the percentage of scores in the data that fell the below, average, or above the recommended cutoff elevations by these authors. Table 9 shows the percentages for validity scale L (Lie). Table 10 shows the percentages for the Infrequency scale (F). Table 11 shows the percentages for validity scale K (correction). Table 12 shows the percentages for basic scale 4 Psychopathic Deviate (Pd). Table 13 shows the percentages for basic scale 6 Paranoia (Pa). Table 14 shows the percentages for basic scale 7 Psychasthenia (Pt). Table 15 shows the percentages for basic scale 9 Hypomania (Ma).

Table 9

MMPI-2 Validity Scale L (Lie): Combined Group: Graham, 2006 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T<50	Low	112	9.41%	6	10.53%
T=50-59	Average	258	21.68%	13	22.81%
T= 60-64	See below	156	13.11%	16	28.07%
T=65-69	See below	163	13.70%	7	12.28%
T=70-79	See below	333	27.98%	11	19.30%
T≥80	See below	168	14.12%	4	7.02%
		1190	100%	57	100%

Note: Post Hoc Validity Scale L Scale Analysis using Graham (2006) criteria. A T=60-64 score indicates, moderate defensiveness; T=65-69, overly positive self presentation; T=70-79, faking good, overly positive self presentation; and a T≥80, faking good, malingering, questionable validity.

Table 10

MMPI-2 Validity Scale F (Infrequency): Combined Group: Graham, 2006 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T<39	Below Average	393	33.03%	12	21.05%
T=40-64	Valid	797	66.97%	44	77.19%
T=65-79	Exaggeration	0	0.00%	1	1.75%
T≥80	High	0	0.00%	0	0.00%
		1190	100.00%	57	100.00%

Note: Post Hoc Validity Scale F Scale Analysis using Graham (2006) criteria.

Table 11

MMPI-2 Validity Scale K (K-Correction): Combined Group: Graham, 2006 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T<40	Low	0	0.00%	2	3.51%
T= 40-64	Average	529	44.45%	23	40.35%
T>65	Fake-Good	661	55.55%	32	56.14%
		1190	100.00%	57	100.00%

Note: Post Hoc Validity Scale F Scale Analysis using Graham (2006) criteria.

Table 12

MMPI-2 Scale 4 (Pd): Combined Group: Green, 2000 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T ≤ 44	Low	173	14.54%	6	10.53%
T = 45-57	Normal	805	67.65%	27	47.37%
T = 58-64	Moderate	191	16.05%	13	22.81%
T ≥ 65	Marked	21	1.76%	11	19.30%
		1190	100.00%	57	100.00%

Note: Post Hoc Scale 4 (Pd) Analysis using Green (2000) criteria.

Table 13

MMPI-2 Scale 6 (Pa): Combined Group: Green, 2000 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T ≤ 44	Low	369	31.03 %	20	35.09 %
T = 45-57	Normal	784	65.94 %	34	59.65 %
T = 58-64	Moderate	35	2.94 %	2	3.51 %
T ≥ 65	Marked	1	.08 %	1	1.75 %
		1190	100.00 %	57	100.00 %

Note: Post Hoc Scale 6 (Pa) Analysis using Green (2000) criteria.

Table 14

MMPI-2 Scale 7 (Pt): Combined Group: Green, 2000 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T ≤ 44	Low	428	36%	19	33.33
T = 45-57	Normal	745	62.66%	34	59.65%
T = 58-64	Moderate	15	1.26%	4	7.02%
T= 65-89	Marked	1	.08%	0	0.00%
T ≥ 90	Extreme	0	0.00%	0	0.00%
		1189	100.00%	57	100.00%

Note: Post Hoc Scale 7 (Pt) Analysis using Green (2000) criteria.

Table 15

MMPI-2 Scale 9 (Ma): Combined Group: Green, 2000 Criteria

T-Score		*Combined Suitable*		*Combined Unsuitable*	
		n	*%*	*n*	*%*
T ≤ 44	Low	239	20.08%	10	17.54%
T = 45-57	Normal	830	69.75%	36	63.16%
T = 58-64	Moderate	98	8.24%	9	15.79%
T ≥ 65	Marked	23	1.93%	2	3.51%
		1190	100.00%	57	100.00%

Note: Post Hoc Scale 9 (Ma) Analysis using Green (2000) criteria.

Discussion

The psychological screening process of police applicants has become a standard practice among most law enforcement agencies nationwide. Law enforcement agencies have found it important to conduct pre-employment screenings of potential police officers. Agencies have recognized the importance and benefits of screening-out psychopathology, and screening-in applicants with desirable characteristics. There is a financial benefit of selecting-in applicants who will make good officers (e.g., minimizing lawsuits, safety of self, other officers, and community). The screening-out of psychopathology is important given the nature and scope of the requirements for the profession (Hargrave & Berner, 1984). As was reviewed previously, there is an incentive to select the most desirable applicants given that police officers are afforded the authority to enforce the law (e.g., arrest). As such, the California Commission on Peace Officer Standards and Training (California POST, 2008) has provided recommendations as to the types of desirable qualities of successful police officers. These desirable characteristics include those of social competence, teamwork, conscientiousness and dependability, impulse control and attention to safety, integrity and ethics, emotion regulation and stress tolerance, decision-making and judgment, assertiveness and persuasiveness, avoiding substance abuse and risk-taking behaviors (California POST, 2008).

The California Commission on Peace Officer Standards and Training (California POST, 2008) has provided recommendations for pre-employment evaluators. The role of law enforcement psychologists is important. According to California POST (2008), evaluators must understand the requirements for a career in law enforcement (e.g., job

description, level of stress etc). Second, evaluators must know and understand the recommendations set forth by California POST including desirable characteristics of a suitable officer, and the recommended psychological tests to be used for the evaluation. Third, evaluators must be competent in their profession (e.g., psychological principles, evaluation and assessment) irrespective of the nature of the evaluation. Training and experience are important given that evaluators are making recommendations for suitability based on available information and are influenced by their training and experience.

Of interest in this study was to examine the MMPI-2's contribution to the overall pre-employment psychological evaluation process. Specifically, to examine the extent to which the suitability could be predicted by selected MMPI-2 scales. The MMPI-2 has been one of the most widely used objective personality measures to identify psychopathological characteristics among law enforcement officers (Bartol, 1991; Borum & Stock, 1993; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). The revised personnel norms (e.g., law enforcement applicants) provided by NCS assessments are helpful for comparing norms by gender (Butcher, 2001). These norms however do not distinguish between suitable and unsuitable law enforcement applicants.

This study examined profile differences in suitable and unsuitable law enforcement applicants. The results of this study predicted profile differences of applicants based on suitability. Overall group differences were expected by suitability among the MMPI-2 validity scales L (Lie), Infrequency scale (F), scale K (correction), scale 4 Psychopathic Deviate (Pd), scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt),

and scale 9 Hypomania (Ma). Specifically, the study predicted that the unsuitable applicants (across gender, between gender, and within gender) would exhibit higher MMPI-2 elevations on scale L (Lie), Infrequency scale (F), scale K (correction), scale 4 Psychopathic Deviate (Pd) scale 6 Paranoia (Pa), scale 7 Psychasthenia (Pt), scale 9 Hypomania (Ma) and scale 5 Masculinity-Femininity (Mf) in comparison suitable applicants. Overall group differences by suitability were not supported in this study in the combined gender, male, and female analyses. The lack of between group differences may be due to the fact that in pre-employment evaluation screenings, psychologists do not automatically disqualify applicants solely based on the MMPI-2 elevations. Rather the MMPI-2 is a tool that can be used in corroboration with other data (e.g., psychological, background information).

Overall differences were found in the exploratory gender analysis across the MMPI-2 scales which support prior research (Weiss et al. 1999; Bartol, 1982). Gender accounted for approximately 9% of the variance. Specifically, scale 5 Masculinity-Femininity (Mf), accounted for about 63.5% of the proportion of variance explained. Females scored significantly higher, whereas, males scored lower on scale 5 Masculinity-Femininity (Mf). Low scores for men on scale 5 Masculinity-Femininity (Mf) are indicative of individuals who identify with traditional masculine type roles (Greene, 2000), whereas, high scores on scale 5 Masculinity-Femininity (Mf) among women are suggestive of individuals who likely identify with more masculine type roles (Greene, 2000). It may be that the female applicants attempted to present themselves in less traditional feminine roles in an effort to fit-in with the norms of a traditionally male dominated field. Another possibility is that females interested in law enforcement

careers already possess less traditional feminine roles. The number of females in law enforcement has grown from being virtually non-existent to having some presence within the field. However, the proportion of women in peace officer positions continues to be relatively low in comparison to males (Erella, 1993; Singer & Singer, 2001). Women account for approximately 13 % of all sworn law enforcement officers (Lonsway et al. 2002; Seklecki & Paynich, 2007). According to Seklecki and Paynich (2007), law enforcement has traditionally been a masculine field given that the general perception of women has been that they are physically and emotionally weak to perform police officer duties. Women have managed to break the barriers into the law enforcement profession and have been able to attain positions that in the past were impossible to obtain. While the amount of women in these professions has increased, they are still relatively low in comparison to male counterparts (Erella, 1993; Singer & Singer, 2001; Seklecki & Paynich, 2007; Zhao, Herbst, & Lovrich, 2001).

All the analyses assessed for deviation of parallelism and yielded results indicating that the suitable group (combined gender) produced higher elevations on scale L (Lie), lower scores on the Infrequency scale (F), and lower scores on scale 4 Psychopathic Deviate (Pd), in comparison to the pooled means. The suitable males produced higher scores on scale L (Lie), lower scores on the Infrequency scale (F), lower scores on scale 4 Psychopathic Deviate (Pd), and higher scores on scale 9 Hypomania (Ma), in comparison to the pooled means. In the exploratory analysis of females, the suitable females produced lower scores on the Infrequency scale (F), and higher scores on scale 9 Hypomania (Ma) in comparison to the pooled means.

Statistically, these results support prior research that job applicants often attempt to present themselves in a positive light (Butcher, 2001).

These results support prior research that applicants produce moderate defensive profiles. Both the suitable group and the unsuitable group produced moderate elevations on validity scales L (Lie) and scale K (correction). On scale L (Lie) 55.79% suitable and 38.59% unsuitable applicants had a $T \geq 65$ (combined gender), whereas, on scale K (correction) 55.55% suitable and 56.14% of the unsuitable group (combined gender) had a $T \geq 65$. These results suggest that many applicants attempted to portray themselves in a positive light and may have attempted to deny minor social flaws (Greene, 2000). Prior research has found that law enforcement applicants tend to produce moderately defensive profiles (Graham, 2006; Kornfeld, 1995; Butcher, 2001). According to Butcher (2001) it is not atypical for job applicants to attempt to cover up some perceived weaknesses, even among individuals who do not present with a serious pathology. Butcher (2001) recommends that in situations in which individuals are likely to produce defensive patterns of responding, that evaluators re-administer the MMPI-2 at a later juncture providing specific instructions in an effort to discourage defensiveness or find an alternative form to assess the domains of interest (Butcher, 2001).

The findings that less than 2% of the unsuitable applicants were correctly predicted into their respective category were unimpressive. The lack emergence of profile differences between the suitable and unsuitable groups as a function of the MMPI-2 scales suggests that there are other important variables in the pre-employment psychological screening process that are better accounting for the proportion of variance

in suitability ratings. This lack of statistical significance may be due to the fact that in pre-employment screenings scale elevations on the MMPI-2 are not automatic disqualifications but rather serve as a guideline for further inquiry in the evaluation process. The MMPI-2 instrument is a tool that helps psychologists assess personality characteristics and was not designed to assess suitability or distinguish between suitable and unsuitable applicants. Psychological instruments are limited to their original purpose which is to measure the characteristics they were intended to measure. The MMPI-2 for instance was designed to help to identify psychopathological characteristics (Graham, 2006).

In addition to the MMPI-2 and/or any psychological instrument used, there are several other factors that are involved in the psychological screening of potential applicants. Evaluators conducting pre-employment evaluations in California integrate psychological test data, the recommendations (e.g., desirable characteristics) set forth by California Peace Officer Standards and Training (CA POST), and consider corroborating information available at the time of the clinical interview (e.g., background information and polygraph information).

Of interest in this study, was to assess profile differences that may have emerged by suitability. Unfortunately, profile differences did not emerge by suitability criterions. The lack of significance found still provides useful information about the MMPI-2's contribution in suitability evaluations. There are several reasons that may help to explain the lack of profile difference by suitability. First, it is important to consider that the MMPI-2 is only one component of the total amount of information considered in pre-employment evaluations. There are other factors considered such as the clinical

interview. Second, it makes sense that selected MMPI-2 scales did not distinguish between the suitable and unsuitable groups given that the MMPI-2 helps to identify possible psychopathology. Elevations on the MMPI-2 do not automatically equate to unsuitability ratings. Third, this study only examined one psychological instrument. As we know, there are other tests are should be investigated to examine their contribution in the pre-employment process. Additional research is also needed that investigates the contribution of other variables in the pre-employment evaluation process and how these variables are used by the evaluators who render a suitability recommendation. Future research should identify and quantify the specific variables involved in the pre-employment screening process. Once these variables are identified and quantified, it is recommended that a standard pre-employment psychological screening battery be developed that can be used by evaluators nationwide.

The practice of psychology is impacted by changes or modifications to state and federal laws. Pre-employment evaluations are not except from this process. The pre-employment selection of police applicants has evolved over the years as a result of changes in the laws. The Americans with Disabilities Act (ADA) has stated that it is illegal for employers to discriminate based on disabilities, as defined by a physical or mental condition (EEOC, 2010). The Americans with Disabilities Act of 1973 and 1990 stated that "employers reasonably accommodate the known physical or mental limitation of an otherwise qualified individual with a disability who was an applicant, unless doing so would impose undue hardship on the operation of the employer's business (EEOC.com, 2010)." The Americans with Disabilities Act was amended in 2008, and limited the types of disability questions employers could ask prior to making

a contingent offer of employment. The Americans with Disabilities Act has impacted the manner in which law enforcement agencies perform pre-employment evaluations. In the past, pre-employment evaluations were conducted at an earlier junction of the pre-employment process in comparison to today. This may have included completing the psychological evaluation prior to the completion of the background investigation or prior to the polygraph examination. The Americans with Disabilities Act has set forth laws which make it illegal for employers to discriminate based on mental status, and limits the types of intrusive questions that they can ask prior to having made a contingent offer of employment.

The practice of law enforcement psychology has changed as a function of the legal changes that have been made by the Americans with Disabilities Act (EEOC, 2010). In the past, pre-employment psychological evaluations for police applicants were conducted at the front end of the hiring process, whereas now, they are conducted at the end of the hiring process, only after an initial offer of employment has been extended to the applicant by the law enforcement agency. Officers who make it to the psychological evaluation phase have passed the background investigation, polygraph, and medical evaluation. Thus, individuals being screened by psychologists may have a higher probability of being psychologically healthy. These applicants have passed other interviews and tests and may be highly functional. This might explain the disparity in the number of suitable and unsuitable applicants in this study. In terms of resources, it may be the best use of limited psychological resources.

Although there are several limitations in this study, traditionally, it has been very difficult for researchers to gain access to pre-employment evaluation records of

law enforcement applicants. In that manner, this study provides useful data about the manner in which applicants present themselves in pre-employment evaluations. There were several limitations to this study. First, the data used in this study was archival. As with all archival data, the data in this study had been originally collected for the purposes of assessing suitability for hire. As has been discussed, there are several variables considered in pre-employment evaluations. Second, this sample was a sample of convenience. Third, there was no random selection of participants all applicants were sent to one psychologist by respective law enforcement agencies. Fourth, the sample in this study was obtained from the San Bernardino, Riverside, and Los Angeles area within Southern California. These results may or may not generalize to other areas of the country or other law enforcement applicants applying elsewhere. Specifically, the characteristics of the applicants in this study who applied to Los Angeles or San Bernardino County may be different than officers in other counties or states. Future studies, should consider collecting data from several evaluators to obtain a large enough sample size for both suitable and unsuitable applicants. Fourth, while no gross violations of homogeneity were apparent in this data, it would have been preferred that the suitability groups be more evenly balanced in terms of sample size.

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