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Emily Alyssa Leonard

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Emily Alyssa Leonard, M.S.

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Emily Alyssa Leonard, M.S.

_____
Radhika Krishnamurthy, Psy.D., ABAP
Professor
School of Psychology
Major Advisor

_____
Jessica L. Wildman, Ph.D.
Associate Professor
School of Psychology

_____
Theodore G. Petersen, Ph.D.
Associate Professor
School of Arts and Communication

_____
Robert A. Taylor, Ph.D.
Professor and Dean
College of Psychology and Liberal Arts

Abstract

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Emily Alyssa Leonard, M.S.

Committee Chair: Radhika Krishnamurthy, Psy.D., ABAP

Research has shown that culture can contribute to differences in personality and shape the way individuals perceive and function in the world. International students are among those affected by cultural differences as they arrive in a new country and go through a period of adjustment. Saudi Arabian students currently make up a large proportion of international students in the United States. Due to wide-spread prejudiced American beliefs about Middle Easterners, they may be exposed to higher levels of discrimination, which can contribute to adjustment problems and increased levels of distress. As a result, some of these students may seek out mental health services. The Minnesota Multiphasic Personality Inventory-3 (MMPI-3) is a measure of personality and maladjustment frequently used in college counseling settings. This study was designed to establish reference group data for Saudi Arabian college students, examine differences in MMPI-3 scores between Saudi Arabian international and domestic American college students, and to investigate the relationship between levels of perceived prejudice and acculturation on Saudi Arabian students' scores. The primary sample consisted of Saudi Arabian international students (N = 47) and the comparison sample consisted of domestic American students (N = 71), both from private universities in Florida. Participants were administered the MMPI-3 online and the Saudi Arabian student

sample was also administered the American-International Relations Scale (AIRS) to assess levels of acculturation and perceived prejudice. The Saudi Arabian sample produced a mean T-score of at least one standard deviation over the mean (60-64) on validity scales Uncommon Virtues (L) and Infrequent Psychopathology Responses (Fp), as well as three of the substantive scales: Thought Dysfunction (THD), Aberrant Experiences (RC8), and Psychoticism (PSYC). No scores exceeded one standard deviation above the normative mean among the Caucasian American comparison sample and there were no low scores (T-score ≤ 40) in either sample. Multivariate analysis of variance (MANOVA) results followed by a series of univariate analyses of variance (ANOVAs) revealed significant differences in scores between the Saudi Arabian sample and the Caucasian American comparison sample on ten of the substantive scales of the MMPI-3, with higher scores for the Saudi Arabian sample on six scales: Thought Dysfunction (THD), Ideas of Persecution (RC6), Aberrant Experiences (RC8), Disaffiliativeness (DSF), Social Avoidance (SAV), and Psychoticism (PSYC). Results of a Mann-Whitney U Test revealed significant differences on two additional scales: Suicidal/Death Ideation (SUI) and Introversion/Low Positive Emotionality (INTR). Higher scores were found for the Saudi Arabian sample on the INTR scale, while the Caucasian American sample scored higher on the SUI scale. Perceived prejudice scores were significantly correlated with Emotional/Internalizing Dysfunction (EID), Suicidal/Death Ideation (SUI), Family Problems (FML), Demoralization (RCd), and Introversion/Low Positive Emotionality (INTR) scores among the Saudi Arabian sample and were most predictive of MMPI-3 scores on EID and SUI substantive scales and the F

validity scale. The relationship between perceived prejudice and MMPI-3 scores was not mediated by acculturation level. Implications of these findings were discussed.

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Chapter 1: Introduction

There has been a steadily growing number of immigrants coming to the United States over the past decades from Middle Eastern countries (Jalali, 2005). According to the Arab American Institute (AAI), there are nearly 3.7 million Arab Americans currently living in the United States, with more than two thirds residing in California, Michigan, New York, Florida, Texas, New Jersey, Illinois, Ohio, Pennsylvania, and Virginia (AAI, 2021). Nearly 82% of Arabs in the United States are U.S. citizens (AAI, 2021), but international students also make up a sizable number of the Arab population. Specifically, the Institute of International Education (IIE) reports an estimated 57,564 international students from the Middle East currently attending school in the United States (IIE, 2021). The largest proportion of these students come from Saudi Arabia, with 21,933 Saudi Arabian international students currently residing in the United States according to the IIE report. This makes Saudi Arabia one of the top ten countries of origin among international students. Since college students have been found to face a variety of mental health concerns, especially anxiety related to academics, finances, family support, and peer support (Jones et al., 2018), it is possible that some number of these students will seek out mental health services.

Arab international students are likely vulnerable to additional stressors outside of those typically experienced by the average college student. Despite consisting of 22 countries including Saudi Arabia, Algeria, Egypt, Iraq, and the United Arab Emirates, the Arab culture is described as vilified and misunderstood, due in part to widespread negative stereotypes following the September 11 terrorist attacks in New York. This was exhibited in a study by Dixon et al. (2009) in which participants were presented images

of North American and Middle Eastern males, some of whom were dressed in traditionally Muslim attire. The images were presented on a computer in succession and participants were asked to rate each image based on whether or not they believed the person in the photo was a terrorist. Results indicated that participants more often classified the images of North American males as "Not Terrorists" and the images of Middle Eastern males as "Terrorists."

Arab heritage encompasses all those who speak Arabic and are linked in some way to the nomadic tribes of Arabia (Abudabbeh, 2005), but Middle Eastern individuals are often lumped together as one homogenous group. Hate crimes against Middle Eastern individuals have consequently taken place in the United States at increasingly high rates over the past two decades. In Iowa, a woman was sentenced for striking and killing two children with her car in 2019 due to her belief that they could be Middle Eastern (Paybarah, 2021). In New York, a man was recently charged with numerous hate crimes against multiple Muslim individuals that spanned over the course of five weeks (Vera & Frehse, 2021). On the west coast, California reported that "violent acts of hate" in Los Angeles have increased by 142% among persons of Middle Eastern decent, the highest rate reported since 2008 (Cooper, 2021).

Because most Arab individuals identify as Muslim, a large amount of discrimination they face is in response to the outward visibility of their religion. For example, women who wear hijabs may face increased levels of discrimination from White Europeans (Weichselbaumer, 2019), which adds to social isolation and heightened levels of distress. A recent survey of individuals of multiple religious affiliations in the United States found that close to 8% of Muslims in the survey reported a suicide attempt

in their lifetime, compared to 6% of Catholics, 5% of Protestants, and 3.6% of Jewish respondents (Awaad et al., 2021). In 2021, a newspaper reported a significant rise in emergency hospital admissions among Muslims in Minnesota following former US President Donald Trump's "Muslim ban," an executive order that banned travel from several Arab countries ("Trump's Muslim ban", 2021). Furthermore, perceived discrimination among Muslim Americans, particularly college students, has been found to be correlated with major depression and generalized anxiety symptom severity (Lowe et al., 2018).

International students' experiences and behavioral functioning are shaped by a culture that may differ greatly from domestic American students. Although not all 22 Arab countries share a single culture, there are common qualities that most endorse. These include a collectivist society, a predominantly Muslim faith, affectionate emotional ties to the Arabic language, a patriarchal and hierarchal family structure, and centrality of the family unit (Abudabbeh, 2005). Together these qualities shape the lens through which Middle Eastern individuals view the world, and thus contribute to individual differences. The process of acculturation and adapting to a new cultural environment also raises challenges that can contribute to adjustment problems. College counseling centers may offer helpful services to international students experiencing some of these stressors.

Personality assessment measures such as the previous editions of the Minnesota Multiphasic Personality Inventory (MMPI/MMPI-2) and its Restructured Form (MMPI-2-RF) have shown to be useful therapeutic and diagnostic tools cross-culturally, taking into consideration the various cultural factors at play among various ethnic groups. These tests have also proven useful in assessing personality characteristics and psychopathology

among college samples and act as a useful therapeutic aid. Finn and Tonsager (1992), for example, found that college students who completed the MMPI-2 and received test results had more positive outcomes than those who did not receive test results, including a significant decline in symptomatic distress and a significant increase in self-esteem. However, very few studies with the MMPI have been done on Middle Eastern samples and even fewer have been conducted with Middle Eastern international student samples. Culturally sensitive assessment practice with the MMPI is therefore difficult without knowledge of how the test scores of Middle Eastern student samples compare to other populations.

The lack of available studies conducted in this area makes Arab populations a unique and much needed area of study. The MMPI-3 was recently published, and many clinicians have begun transitioning to it from the MMPI-2 and MMPI-2-RF. The MMPI-3 has already shown utility among college settings (Ben-Porath & Tellegen, 2020a), but to date there are few studies examining the MMPI-3 with Middle Eastern students and no published studies looking specifically at Saudi Arabian international students. There is a need to examine differences in the MMPI-3 scores of Middle Eastern international and Caucasian American college students to enhance the utility of the test for Middle Eastern individuals. It is also necessary to consider the potential effect of perceived discrimination on these differences, given the negative portrayal Middle Eastern individuals face upon arriving in the United States. This study aimed to do both using a sample of Saudi Arabian international students, as Saudi Arabians constitute the majority of Middle Eastern international students.

Chapter 2: Review of Literature

Personality: General Definitions and Descriptions

Although the term "personality" has many meanings, there is general consensus among psychologists that the term represents a construct encompassing various aspects of an individual's behaviors, feelings, and interactions. These include a person's habits, attitudes, sentiments, and dispositions (Allport, 1937). The term can further be defined as behaviors that are "socially relevant, stable, have continuity over time, and are assumed to reflect motivational properties," (Beutler et al., 2011, p. 1). As such, a person's personality can be expected to remain relatively consistent across situations and time.

Personality traits are constructs rather than physical manifestations (Loevinger, 1957). To make accurate interpretations about personality, it is essential to obtain accurate measurement of these underlying traits. Harkness (2002) described the way in which personality measures tap into underlying embedded traits using what is called the constructive-realist approach. This approach emphasizes researchers' reliance on constructs and theories to obtain usable data when studying personality traits. Without empirically based personality theories, it would be difficult to interpret the constructs of personality traits. Thus, theories of personality provide the foundation needed to conduct research on personality traits.

The dominant theory in the study of personality is trait theory, which asserts that social behavior is the result of consistent, enduring patterns of behavior that make up a person's personality (Hogan et al., 2000). "Consistent" and "enduring" are key words in that traits differ from the transient quality of states (Harkness, 2002). All humans possess some level of most traits, but the different pattern or "trait level" of these behaviors

contributes to individual differences in personality (Tellegen, 1988). Exploring these differences forms the basis of personality psychology.

The accurate measurement of personality traits relies on the fact that these traits remain relatively stable over time. A large amount of research has supported personality's stability across the lifespan and uncovered various factors contributing to this stability. Genetics, environmental continuity, and person/environment transactions, for instance, have all been found to play a role in personality's general stability over time (Roberts et al., 1999). The interaction of these factors can be observed in the way people choose roles and environments that are consistent with their personality and remove themselves from those environments that are incongruent with their personality.

Many longitudinal studies have been conducted over the years that provide support for the general stability of personality characteristics. For example, behavioral qualities demonstrated during childhood have been linked to personality development in adulthood (Caspi & Silva, 1995). Caspi et al. (2003) further demonstrated this finding by measuring adult personality outcomes of 1,000 individuals who were first assessed at 3 years old. Results from the study found correlations with moderate effect sizes between specific behavioral styles of children and adult personality traits. Similarly, Shiner et al. (2003) used rank-correlation to examine the link between four childhood personality traits (Mastery Motivation, Academic Conscientiousness, Surgency, and Agreeableness) and adult personality traits 20 years later. Among a sample of 152 individuals tested as children, the study found that personality traits remained moderately consistent and were significantly predictive of adaptive behaviors in adulthood. The evidence supporting the stability of personality traits has also come from meta-analyses of test-retest correlations.

One such study conducted by Roberts and DelVecchio (2000) found that, from 152 longitudinal studies, trait consistency correlations increased from .31 in childhood to .74 between the ages of 50-70.

In addition to personality being stable across time, theorists have argued that humans possess a set of universal personality traits that have developed over time as a means of survival. For instance, the five-factor model is a widely accepted personality model that describes individual differences in personality along five dimensions: Extraversion, Openness, Conscientiousness, Neuroticism, and Agreeableness (Goldberg, 1981). McCrae and Costa (1997) found that the structure of the five-factor model could be closely reproduced among German, Portuguese, Hebrew, Chinese, Korean, and Japanese samples. The concept of a universal personality structure was further supported in a study that translated the Big Five Inventory (BFI) into 28 languages, administered across 56 nations (Schmitt et al., 2007).

Of the research that has uncovered changes in personality across the lifespan, common patterns emerge. Specifically, these changes tend to occur during adolescence and early adulthood. In one meta-analysis of 92 studies examining patterns of mean-level change in personality traits across the lifespan, Roberts et al. (2006) found that social dominance increases in adolescence (d=.20, p<.05) and young adulthood (d=.28, p<.05), but found no sizable changes in the trait after the age of 40. The study mirrored these findings among other traits, including conscientiousness and emotional stability. Srivastava et al. (2003) similarly demonstrated that certain personality characteristics such as conscientiousness increased throughout early adulthood but changed less after the age of 30.

While these findings seemingly contradict the previously stated argument for personality's stability, it is important to note that subtle personality change during early adulthood is not unexpected and can be explained by the natural maturation process. The maturity principle states that as people age, they tend to increase in assertiveness, self-control, responsibility, and emotional stability due to the facilitative effects these qualities have on an individual's functioning in society. From this perspective, it is not that a person's personality is dramatically altered in early adulthood, but rather that they undergo a natural maturation process that is functional in nature (Roberts et al., 1999). Personality can therefore be considered stable enough to yield accurate measurements and interpretations.

Culture's Effects on Personality and Adjustment

Of all the reasons individual differences in personality traits may emerge, most can be attributed to genetic and environmental differences. The impact of genetic differences can be seen through the evolutionary process. Natural selection contributes to individual differences, including personality traits, as variations in certain traits are more favorable and correlated with survival (Buss, 1999). Thus, individuals with these traits are more likely to reproduce and pass on these traits to future generations. Examples of environmental differences include an area's terrain, climate, resources, and social structure (Maccoby, 2000). These factors can vary greatly across different parts of the world and contribute to variations in culture. Culture can be defined as a standard set of procedures, assumptions, norms, and values of a society (Triandis & Suh, 2002).

Because physical environment can contribute to individual differences in behavior, and culture can vary greatly by location, one might expect noticeable

differences to be found when comparing individuals from different parts of the world. However, this assumption is not entirely correct. As previously stated, there is evidence for the universal structure of the five-factor model of personality (McCrae & Costa, 1997; Schmitt et al., 2007). This means that the dimensions of Extraversion, Openness, Conscientiousness, Agreeableness, and Neuroticism can be observed across the world. However, even if the classification of personality traits is the same across cultures, the ways in which they are expressed and received by others may vary due to differing norms and values.

A sizable amount of research has focused on two specific dimensions of culture that have been found to influence personality by means of differing norms and values: collectivistic and individualistic cultures. Individualistic cultures have been described as "guilt societies" in which social behavior is dictated by what benefits the individual, while collectivist cultures have been described as "shame societies" in which social behavior is dictated by what benefits the entire group (Yakeley, 2018, p. 20). In other words, collectivist cultures place greater emphasis on the avoidance of certain behaviors that are seen as shaming to the community, while individualistic cultures place greater emphasis on personal choice and obtaining personal goals. When examining patterns of personality within collectivist and individualistic cultures, the terms "allocentrism" and "idiocentrism" are used (Triandis, 2001, p. 910).

Allocentrics tend to differ from idiocentrics across several domains. Allocentrics belonging to collectivist cultures generally define themselves based on social ties (Triandis, 2001). This trend was exhibited by a study that asked individuals from collectivistic and individualistic cultures to provide self-definitions (Triandis et al.,

1990). It was found that individuals from collectivistic cultures provided self-definitions that contained some form of social content 30% to 50% of the time, whereas those from individualistic cultures gave self-definitions containing social content only 20% or less of the time. Similarly, a study examining 16 cultures found that individuals from collectivistic cultures had more interdependent self-concepts and were more likely to attribute failure to external causes, whereas those from individualistic cultures had more personally focused self-concepts and attributed failure to internal causes (Carpenter, 2000).

Given the importance placed on social ties in collectivist cultures, allocentrics receive more social support from, and are more likely to conform to, the norms and values of their in-group. Bontempo et al. (1990) found that a collectivist Brazilian sample reported being more willing to act based on the expectations of others and enjoy these actions, whereas an individualistic American sample reported being less willing to adhere to and found less enjoyment in complying to social norms. This contributes to the finding that allocentrics tend to exhibit more agreeable tendencies while idiocentrics tend to have more dominant traits (Moskowitz et al., 1994). Other self-described traits have been found to be linked to individualistic and collectivistic cultures as well. In a study comparing students from a collectivistic Filipino culture and an individualistic American culture, the individualistic sample more frequently rated traits of independence, assertiveness, directness, and pleasure-seeking, as more valued and self-descriptive than the collectivist sample (Grimm et al., 1999).

Other concepts related to the ways in which cultural norms are imposed on a society include the “tightness” or “looseness” of the culture (Triandis & Suh, 2002, p.

139). Tight cultures are typically associated with collectivism and are those in which cultural norms are strictly imposed. Loose cultures are more tolerant of variations or lack of adherence to cultural norms and are typically associated with individualistic cultures. The more complex the culture is, the more likely it is to be individualistic and loose (Triandis, 1990). Complexity refers to the many interacting parts of a culture. Greater complexity results in more numerous choices and opportunities, which in turn contributes to looser, more individualistic societies. All these factors come together to influence the way in which individuals interpret and experience the world, and therefore contribute to individual differences in personality.

Cultural influences also shape the way an individual adjusts to stressful situations and experiences psychological distress. For example, shame has been found to be linked to various psychopathological symptoms, including depression, anxiety, self-derogation, and narcissism (Harder et al., 1992). Observing how shame is experienced in various cultures can provide information on how individuals may experience mental illness. Shame is more rampant in collectivist "shame societies" in which the threat of shame and ostracism serves as a device for maintaining social order (Yakeley, 2018). This emphasis on shame over guilt may contribute to research findings that individuals from collectivist cultures tend to display fewer guilt-related symptoms in psychological disorders such as depression (Draguns, 1995).

Similar to how universal patterns of personality are displayed across cultures, the way some disorders are displayed cross-culturally has also been found to be universal. Similar core symptoms have been identified cross-culturally for both major depression and bipolar disorder (Kirmayer & Ryder, 2016). However, the universal presence of these

symptoms does not mean that disturbances are expressed in the same way across cultures. Rather, psychological adjustment and maladjustment are subject to cultural shaping. Previous research has indicated that more severe disorders such as schizophrenia involve universal symptom patterns such as restricted affect, bizarre thought processes, poor insight, and unrealistic information processing (Strauss, 1979). However, more recent research indicates that although schizophrenia is a mental disorder found across the world, it manifests itself differently across cultures in terms of the content of hallucinations or delusions, and in frequency of negative symptoms compared to positive symptoms (McLean et al., 2014).

The importance of understanding cultural context has become increasingly emphasized over the past few decades and a growing amount of research has focused on the unique symptom expressions of various cultures. It has been argued by several researchers that collectivistic cultures, specifically Chinese cultures, tend to express somatic symptoms more frequently than psychological symptoms compared to Western cultures (Kleinman, 1982; Ryder et al., 2008; Yeung et al., 2004). In a study examining 40 depressed Chinese American primary care patients, for example, only 14% spontaneously reported experiencing psychological symptoms such as irritability, rumination, or poor memory (Yeung et al., 2004). Interestingly, 93% of the same sample of patients endorsed psychological symptoms when asked to fill out a symptom checklist. This suggests that collectivist cultures do experience psychological symptoms, but the way in which they interpret and report their symptoms can vary. Somatic symptoms appear to be more easily accepted in shame societies, possibly due to the stigma attached to psychological maladjustment (Kirmayer & Ryder, 2016).

The increased understanding that cultural context shapes individual experience has led professional psychological organizations to begin prioritizing the formulation of cultural identity. The Outline for Cultural Formulation introduced in the Diagnostic and Statistical Manual of Mental Disorders- Fourth Edition (DSM-IV; American Psychiatric Association [APA], 2000), for example, provided a foundation for gathering information concerning an individual's cultural identity and its relation to their mental health. This practice was continued in the DSM-5 (APA, 2013), with categories including individual cultural identity, cultural conceptualizations of distress, psychosocial stressors, and cultural features of resilience. Guidelines on multicultural practice have also been released, encouraging psychologists to recognize and be sensitive to the impact multiculturalism has on individuals (APA, 2017).

Despite the growing body of knowledge concerning multiculturalism and its various influences on personality and psychological adjustment, not all cultures have received equal attention. Little research has been conducted on Middle Eastern and Arab populations compared to other Western, Asian, or Latin American cultures. It is not possible to say that all Arab countries share a single culture, but there are common qualities that most share. These include a collectivist society, a predominantly Muslim faith, affectionate emotional ties to the Arabic language, a patriarchal and hierarchal family structure, and centrality of the family unit (Abudabbeh, 2005). As a collectivist shame culture, individualistic pursuits may be seen as selfish, and privacy is valued as a means of maintaining family honor. There is little doubt, given what is known about culture's effect on personality, that these factors contribute to individual differences in personality among Arab individuals compared to Western individualist societies.

However, very few studies have been conducted examining these differences, making Arab populations a unique and much needed sample of study.

Acculturation and Adaptation of International Students

Differing cultural norms and values between two cultures are not just studied in theory, but physically experienced by those who migrate from one country to another. Acculturation refers to the process of cultural change that results from contact between two separate cultural groups (Berry, 1994). Although this definition implies changes occurring in each of the two separate cultural groups, a more accurate description of acculturation involves one non-dominant cultural group undergoing changes due to the influence of the more populous cultural group. These dominant groups by definition have more power, and therefore more influence, over minority acculturating groups. Being of the minority group in a dominating culture can contribute to feelings of helplessness, leading the person of the minority culture to adapt or potentially conform to the majority culture (Dow, 2010). Ideally, an immigrant is able to integrate and adapt to the dominant culture while still retaining the aspects of his or her original cultural identity deemed most important (Berry, 2001). Successful integration allows immigrants to live cohesively among the dominant culture without surrendering the cultural heritage that has made them who they are, thus limiting the emotional distress ultimately experienced. Integration is not always successfully obtained, and the process of acculturation is not without stress. “Culture shock” is a term used to describe the somatic, emotional, and cognitive disturbances felt by an individual as a result of being immersed in an unfamiliar cultural environment (Cupsa, 2018.)

Although most acculturation studies focus primarily on immigrant populations, international college students have emerged as a unique population of study in recent research. Unlike immigrants who generally move to a new country with the expectation of permanence, international students have a predetermined duration of stay. There is a general expectation that first year college students, regardless of whether they are domestic or international, may experience academic and social transition issues that are a natural part of a college experience. Research has shown, however, that there are distinct differences in the type of adjustment demands international students face compared to domestic students (Andrade, 2006), which include language proficiency, academic skills, and educational background. These unique issues further influence international students' successful integration into the dominant culture. Undergraduate and graduate international students with a wide-range of social supports and integrative approaches to acculturation have been found to experience reduced levels of culture shock (Sullivan & Kashubeck-West, 2015), and therefore less stress related to acculturation.

A distinct concern faced by many international students revolves around language. Ramburuth (2001) found that over three quarters of students from diverse backgrounds attending an Australian university struggled with writing in the English language and required additional academic support. In contrast, only one quarter of native English-speaking students from the same university needed the same assistance. Difficulty understanding the language of presented academic material may make academic adjustment increasingly difficult for international students. Another study revealed that listening comprehension and oral proficiency were the two greatest language-related challenges faced among 716 international graduate students at an

Alabama university, with participants reporting difficulty participating in class, low self-esteem, and feeling powerless due to their language difficulties (Kuo, 2011). Thus, not only does a lack of fluency affect the quality of some international students' written assignments, but it can also lead to genuine distress. Given that academics play such a large role in international students' experience in a new country, difficulty in this area may impede integration and further promote culture shock.

International students also face unique difficulties in terms of social adjustment. Being away from previously established social ties that exist in international students' country of origin can lead to diminished social support. In a longitudinal study examining 294 international and domestic students at a midwestern university in the United States, Hechanova-Alampay et al. (2002) found that international students had a harder time adjusting during the first six months of school, in part due to less experienced social support. Kashima and Loh (2006) further found that greater positive interactions with local, domestic students contributed to better adjustment among Asian international students. The mere presence of positive interactions and attachments appear to be more important than whether those attachments are to one's own country of origin or to the host country. For example, a study of 2,774 immigrant students across the United States from six ethnic groups found that reported attachments to either country of origin, the United States, or both, was associated with greater levels of psychological well-being (Schwartz et al., 2013). These findings suggest that acculturation is not a prerequisite for international students' successful adjustment, but that it may facilitate students' ability to obtain social support and therefore result in better adjustment.

Perceived Discrimination

Regardless of acculturation level, ethnically diverse individuals often face additional difficulties stemming from discrimination. In one meta-analysis, Schmitt et al. (2014) found that perceived discrimination was negatively correlated with psychological well-being. Adults who reported higher levels of perceived discrimination were found to have greater symptoms of depression and anxiety, higher levels of psychological distress, lower self-esteem, and less general life satisfaction than those who reported lower levels of perceived discrimination. Similar findings have been found in children. In examining 60,700 respondents to a US national survey of children's health, Weeks and Sullivan (2019) found that racial discrimination was significantly correlated with a variety of mental health problems among children between the ages of 6-17. These included depression, anxiety, and behavior problems.

The relationship between perceived discrimination and psychological adjustment has been studied across a number of ethnic minority groups. Moradi and Risco (2006) found that perceived discrimination experiences were positively correlated with psychological distress and negatively correlated with sense of personal control among a sample of Latina/o Americans. Noh and Kaspar (2003) also found a significant relationship between perceived discrimination and depressive symptoms among a Korean sample. Similar results were replicated in another study utilizing a sample of Arab American adult participants (Moradi & Hasan, 2004). Not only were higher levels of perceived discrimination found to be related to lower levels of personal control, but lower levels of personal control were related to lower self-esteem and increased psychological distress. This suggests that discrimination may contribute to reduced psychological well-being by way of reducing one's belief about his or her capability to influence his or her

surroundings. Several studies have also demonstrated relationships between racial discrimination and negative mental and physical health outcomes in Black Americans, including depression (Brown et al., 2000; Mereish et al., 2016), decreased utilization of health services (Mouton et al., 2010; Sellers et al., 2013; Bleich et al., 2019), and lower self-esteem (Versey & Curtin, 2016).

The "visibility" of ethnic minority group members appears to play a role in the levels of perceived discrimination experienced by ethnic minorities. Depending on the race and ethnicity of the dominant population, some ethnic minorities may stand out more than others. In America's predominantly Caucasian population, racial minorities such as Black, Chinese, and Middle Eastern individuals tend to be more distinguishable than White minorities, such as Italians or other Europeans. Those belonging to visible minority groups are therefore easier targets for discriminatory action. Dion and Kawakami (1996) illustrated this finding in a study of 902 respondents from both "visible" minorities and White minorities living among a predominantly Caucasian population. Those belonging to more outwardly apparent minority groups, including Black, Chinese, and South Asian individuals, were found to perceive greater levels of discrimination than White minorities.

Discrimination influences an individual's self-evaluation in addition to affecting his or her general mental health and psychological well-being. Interestingly, some evidence suggests that higher levels of perceived discrimination may act as a sort of buffer when it comes to protecting the self-concept. Dion (2002) argues that minority group members frequently make attributions as to whether a negative experience is the result of discrimination or the result of their own deficits, which in turn affects their self-

evaluations. When a minority group member attributes a negative experience to discrimination or prejudice, he or she is less likely to internalize the experience as resulting from perceived failings or shortcomings. Eccleston and Major (2006) elaborated on this argument and found that minority group members who identified more strongly with their ethnic group were more likely to attribute ambiguous negative events to discrimination. Even when not internalized, however, discrimination is still likely to be experienced as a stressor that influences certain aspects of life such as interpersonal relationships, which can cause or exacerbate psychological distress.

American college students belonging to various ethnic minorities have also been found to be negatively affected by discrimination, despite being citizens of the country. In a study of 84 Korean American college students, Lee (2005) found that those with higher levels of perceived discrimination had significantly more depressive symptoms, less social connectedness, and lower self-esteem. Furthermore, Stevens et al. (2018) found that among 69,722 undergraduate students participating in a national college health assessment, 15-25% of those who reported experiencing discrimination also reported that the discrimination had negatively impacted their academic performance. This negative impact was particularly higher among Hispanic and Asian students. Another study using a sample of 149 racially diverse college students attending a predominantly white university found that those who reported experiencing discrimination-related social events had greater anger, anxiety, depressive symptoms, and loneliness (Jochman et al., 2019).

The negative effects of minority group discrimination extend to international students, as several studies have demonstrated that international students experience

discrimination at higher rates than domestic students. Lee and Rice (2007), for example, found that a sample of 24 international students from 15 countries attending a southwestern university in the United States reported experiences of unfairness, inhospitality, cultural intolerance, and confrontation with American society. At a midwestern university in the United States, international students who identified as African, Asian, or South American (total $N = 925$) perceived prejudice at a significantly higher rate than those of European descent (Roysircar & Plake, 1992). A longitudinal study by Ramos et al. (2016) further displayed that perceived discrimination impeded the process of acculturation among a sample of 113 international students in the United Kingdom. These findings suggest that the presence of perceived discrimination results in less permeable group boundaries among international students, as these individuals are more likely to reject the host culture and remain grounded in their country of origin.

While choosing to retain one's culture of origin is not inherently problematic, failing to integrate into the dominant culture can reinforce feelings of isolation and a lack of acceptance. This has been illustrated by research noting the negative impact of higher levels of perceived discrimination on social and psychological adjustment, particularly by way of homesickness. Van Tilburg et al. (1999) found that a sample of homesick women had poorer self-reported health, more depressed mood, and greater difficulty making friends compared to non-homesick women. When examining international students specifically, a study comparing 198 international students to domestic American students attending the same university found that international students who reported higher levels of perceived discrimination experienced higher levels of homesickness (Poyrazli & Lopez (2010). Higher levels of homesickness were also found to be present among

international students who were younger in age and were less proficient in the English language. The presence of homesickness is notable due to its correlation with increased stress levels, depressed mood, poorer social interaction, and decreased cognitive functioning (Hannigan, 2007). Hendrickson et al. (2011) found that among 84 international students in Hawaii, those who had a greater number of individuals from the host country in their social networks were less homesick, more socially connected, and more content overall. Given the positive impact of establishing friendships with individuals from an international student's host country, perceived discrimination may be viewed as increasingly problematic due to its interference with maintaining or establishing these relationships.

Although most of the research focusing on discrimination involves ethnic and racial minorities, discrimination has also been found to negatively impact the psychological well-being of religious minorities, particularly those identifying as Muslim. Roysircar and Plake (1992) found that among a sample of 925 international students attending a midwestern university in the United States, those who identified as Muslim perceived discrimination significantly more than Protestant or Roman Catholic students. As Protestants and Catholics are of the majority religious groups in the United States, this finding is not surprising. Students from majority Christian backgrounds have been found to hold less appreciative attitudes toward Muslims compared to students from other religious minority groups such as Buddhists, and even agnostics (Rockenbach et al., 2017). This might suggest that non-Christian minority groups are more likely to hold empathy for Muslim students' experience of marginalization. Among a sample of 141 Muslim American college students, Lowe et al. (2018) found that perceived

discrimination was positively associated with depressive and anxiety-related symptom severity. Anxiety-related symptoms were found to be particularly high for those who had a strong Muslim American identity, likely due in part to the fact that perceived discrimination increases acculturative stress (Tineo et al., 2021).

Personality Assessment

Assessing qualities of personality has been of interest for centuries. Primitive personality assessment methods date back to ancient civilizations in China, where government officials were appointed based on examinations measuring certain personal characteristics (DuBois, 1970). During the nineteenth century, an increased interest in objective measurement of personality traits emerged. This began not with psychologists, but rather physicians who embraced the phenomenon of "phrenology," or the belief that physical characteristics such as head shape could correlate with underlying personality characteristics (Butcher, 2010). This movement was short lived due to its lack of empirical support, but interest in the scientific assessment of personality strengthened in the twentieth century. The notion that personality traits and psychological attributes could be studied through questionnaires and comparisons to normative data was first introduced by Sir Francis Galton (Butcher, 2010). Galton's ideas were expanded upon, and eventually psychological assessment became the predominant focus of clinical psychology. Psychologists were called upon during World War I and World War II to administer personality assessment questionnaires developed to assess soldiers' emotional fitness for duty. Although used successfully during wartime, an abundance of face valid items and a reliance on a rational test construction method hindered these questionnaires' usefulness (Colligan, 1985). This ultimately led to an increased interest and effort in the

development of new empirically based tests that could be used for selection, diagnosis, and placement of individuals among various settings (Barenbaum & Winter, 2008). The result was the emergence of two major categories of personality tests: performance-based and self-report.

Methods of Personality Assessment

Performance-based tests, referred to previously as "projective" tests, are typically unstructured in terms of response format (Smith & Archer, 2014). The reasoning behind having an unstructured response format is to allow the respondent free reign to respond to a test stimulus without imposing restrictions to his or her responses. The respondents are then able to project information, often unconsciously, about their inner experiences when responding to test items that are then interpreted by the examiner. At the other end of the continuum are self-report or "objective" measures. These tests are structured and ask the respondent to answer a series of questions following a type of response format, such as "yes" or "no," or following a Likert-type rating scale (Butcher et al., 2013). Self-report measures can further be classified as either "omnibus," which assess multiple areas of personality and functioning, or "narrow-band," which measure components of a single area (Smith & Archer, 2014). A combination of performance-based and self-report tests is often useful because each method offers a unique kind of information about the respondent (Krishnamurthy & Meyer, 2016).

Administering a personality test involves a series of thoughtful steps that make up the psychological assessment process. According to Beutler et al. (2011), these steps consist of identifying the problem to be addressed, selecting appropriate methods for extracting the necessary information, integrating sources of information around the

problem, and obtaining conclusions. The usefulness of any personality test depends on the questions being asked, as well as the test's quality of standardized materials and procedures, objective scoring methods, appropriate norms, and established validity (Dahlstrom, 1993). For this reason, certain tests are used more commonly than others due to their wide range of empirical support.

Personality assessments are most often applied in clinical treatment settings and are used for a variety of purposes. These include identifying the general nature and severity of psychological problems experienced by the patient, assisting the psychologist in treatment-related decisions, and providing a measure of progress in treatment (Weiner & Greene, 2008). Clinical personality assessment places emphasis on the evaluation of psychopathology, that is, any type of emotional, cognitive, behavioral, or interpersonal dysfunction that results in discomfort and impairs the individual's ability to function. The most commonly used performance-based measures of psychopathology are the Rorschach and Thematic Apperception Test. The most commonly used self-report measures have consisted of the different editions of the Minnesota Multiphasic Personality Inventory (MMPI), which is currently the MMPI-3 (Ben-Porath & Tellegen, 2020a), the Personality Assessment Inventory, and the Millon Clinical Multiaxial Inventory (currently the MCMI-IV; Millon et al., 2015).

Development of the MMPI, MMPI-2, and MMPI-2-RF

Minnesota Multiphasic Personality Inventory (MMPI)

The MMPI was born from physicians' and psychiatrists' need to assess the psychological status of patients in an objective, time-efficient manner (Colligan, 1985). The test was originally created to facilitate more accurate diagnosis of clinical patients

through the use of clinical scales than was possible from diagnostic interviews, and the focus gradually evolved from individual scale correlates to correlates of overall patterns of scale scores (Ben-Porath & Tellegen, 2020a). This pattern of scores makes up what is called the "profile," and certain combinations of scores were referred to as "code types" (Hathaway & McKinley, 1942). Over time the MMPI became used less for simply diagnosing patients, and more for assessing normal and abnormal personality characteristics.

Hathaway and McKinley (1942) developed the MMPI using an approach that differed from the faulty assumptions of face validity and rational test construction that marked early assessment efforts. Rather, Hathaway and McKinley believed that meaning could be obtained from comparing items endorsed by a person in a certain manner to other people who endorsed items in a similar way. They intended "to create a large reservoir of items from which various scales might be constructed in the hope of evolving a greater variety of valid personality descriptions that are available at the present time" (Hathaway & McKinley, 1940, p. 249). The "reservoir" of items emerged from a collection pool of more than 1,000 items gathered from previously existing research, structured interviews, textbooks, and psychiatric examination forms (Colligan, 1985). Clinical judgment was used to reduce the pool of 1,000 items down to 550 items that covered 26 different symptom categories in the original version of the test.

To construct the basic MMPI scales, the authors used an empirical keying approach in which responses belonging to patients diagnosed with various psychiatric disorders were compared against those of a normative sample. The normative sample data was collected through MMPI responses of a convenience sample consisting of 724

relatives and visitors of patients at a Minnesota hospital. MMPI responses were then gathered from a second group consisting of patients at the same Minnesota hospital, who represented all major psychiatric categories being used at the time of the test construction (Graham, 2012). The clinical subjects were further divided into eight subgroups based on their diagnoses: Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, Paranoia Psychasthenia, Schizophrenia, and Hypomania. Item analyses were conducted to determine which items were significantly different in endorsement rates of the normative and clinical groups, and items found to be significantly different were assigned to the appropriate scales named after the eight diagnostic subgroups. The Masculinity-Femininity (Mf) and Social Introversion (Si) scales were later added, ultimately forming the 10 MMPI Clinical scales (Graham, 2012).

Because not every respondent could be expected to answer honestly in a consistent, unbiased manner, Hathaway and McKinley (1942) developed four validity scales used to detect deviant test-taking attitudes that could call into question the interpretability of test results. The simplest of the validity scales is the Cannot Say (?) score, which is a count of items the test-taker omitted or answered as both true and false. The Lie (L) scale was developed to detect test-takers' naive attempts to present themselves in an unrealistically favorable manner, such as through denying minor personal weaknesses. The Infrequency (F) scale consisted of items endorsed in a particular direction by less than 10 percent of the normative sample, allowing the examiner to detect when test-takers were overreporting psychological disturbance. The Correction (K) scale was developed to identify defensive test-taking behaviors that would lead to an underreporting of psychological disturbance. The clinical scales most affected

by defensiveness were later identified and fractions of the K scale score was used to develop a correction factor for these scales (Graham, 2012).

The final version of the original MMPI consisted of 10 clinical scales. The interpretation of these scales was further enhanced through 28 Harris-Lingoes subscales for clinical scales 2 (Depression), 3 (Hysteria), 4 (Psychopathic Deviate), 6 (Paranoia), 8 (Schizophrenia), and 9 (Mania; Harris & Lingoes, 1955), in which items reflecting a specific trait or sharing similar content were grouped together (Greene, 2012). Wiggins (1969) later developed 13 content scales to provide examiners with additional interpretive information. As the MMPI gained popularity for its clinical utilization over the decades, independent researchers began developing many supplementary scales to aid in research and clinical applications. Two of these supplementary scales, Welsh's Anxiety (A) and Welsh's Repression (R), were found to best reflect the primary factors of general maladjustment and repression revealed through factor analyses (Friedman et al., 2015).

Minnesota Multiphasic Personality Inventory-2 (MMPI-2)

Despite its success and widespread use, concerns arose regarding the first edition of the MMPI. Critics took issue with the original normative sample used to develop the MMPI, as it was a convenience sample and not necessarily an accurate representation of the population in the United States at the time (Greene, 2012). For example, the original normative sample was made up entirely of Caucasian individuals who were typically around the age of 35, married, and living in a small or rural town. There was also criticism over the test items themselves. Some of the items contained outdated, sexist language, and there was concern that the original item pool did not reflect current diagnostic and therapeutic concerns (Friedman et al., 2015). Items related to substance

abuse and family functioning, for instance, were lacking. Ultimately these combined concerns resulted in a re-standardization project initiated in 1982.

The primary goal of the re-standardization project was to gather a modern normative sample that more accurately represented the general population (Greene, 2012). Butcher et al. (1989) led this endeavor, gathering a more diverse sample of respondents reflective of the U.S. census. Concerns regarding the original MMPI item content was also addressed, with revision of 141 of the 550 items to eliminate outdated terminology and improve the quality of content. Additional items were added, and the final version of the MMPI-2 contained 567 items. Effort was made to maintain continuity between the original MMPI and its revision (Ben-Porath, 2012). Thus, the same Validity scales and 10 Clinical scales were carried over from the original MMPI.

In terms of additional scale development, Butcher et al. (1989) added two new Validity scales. The Variable Response Inconsistency (VRIN) consists of 67 item pairs of similar or contrasting content and measures the examinee's consistency of responses. The True Response Inconsistency (TRIN) contains 20 item pairs of opposite content and measures an examinee's tendency to respond in an overly acquiescent or nay-saying manner. Along with the retained F scale, Butcher et al. (1989) added the Back Infrequency (Fb) and Infrequency-Psychopathology (Fp) scales to detect over-reporting on the MMPI-2. Lees-Haley et al. (1991) later added the Fake Bad scale (FBS), eventually renamed the Symptom Validity scale, to identify malingering in personal injury litigation. The K and L scales were unchanged in the MMPI-2, but an additional scale used to detect underreporting was developed by Butcher and Han (1995). The Superlative Self-Presentation (S) scale measures an examinee's inclination to present

themselves in an overly positive light. The Validity and Clinical scales of the MMPI and MMPI-2 are summarized in Table 1.

Fifteen new Content scales were developed for the MMPI-2 (Butcher, Graham, Williams, & Ben-Porath, 1990), including Anxiety (ANX), Fears (FRS), Obsessions (OBS), Depression (DEP), Health Concerns (HEA), Bizarre Mentation (BIZ), Anger (ANG), Cynicism (CYN), Antisocial Practices (ASP), Type A (TPA), Low Self-Esteem (LSE), Social Discomfort (SOD), Family Problems (FAM), Work Interference (WRK), and Negative Treatment Indicators (TRT). Interpretability of twelve of the Content scales was further elaborated on through the development of Content Component scales (Green, 2012). Several of the MMPI Supplementary scales developed over the years were also incorporated into the MMPI-2 (Graham, 2012) and placed as a standard set of 15 Supplementary scales organized into groupings of Generalized Emotional Distress, Broad Personality Characteristics, Behavioral Dyscontrol, and Gender Role. The MMPI-2 Supplementary scales also included a set of newly developed Personality Psychopathology Five (PSY-5) scales based on the Five Factor Model (Harkness et al., 1995). The PSY-5 scales measure personality traits rather than symptoms which can aid in identifying attributes of personality that affect an individual's functioning. Over the decade following the MMPI-2's publication, a vast amount of research was done examining norms and developing or revising various scales (Ben-Porath, 2012). Much of this research culminated in Butcher et al. (2001) publishing a revised edition of the MMPI-2 manual that was designed to improve interpretive guidelines throughout the test. The norms and item composition of the MMPI-2 scales were not altered in the revised

manual (Ben-Porath, 2012). The MMPI-2 became the most widely used personality test in clinical practice (Butcher & Williams, 2009).

Criticism of conceptual overlap and heterogeneity among the MMPI's Clinical scales led to another later development of the MMPI-2 (Ben-Porath, 2012). Tellegen et al. (2003) created nine Restructured Clinical (RC) scales aimed to reduce excessive intercorrelations and narrow the focus of the scales. The RC scales include Demoralization (RCd), Somatic Complaints (RC1), Low Positive Emotions (RC2), Cynicism (RC3), Antisocial Behavior (RC4), Ideas of Persecution (RC6), Dysfunctional Negative Emotions (RC7), Aberrant Experiences (RC8), and Hypomanic Activation (RC9). Clinical scales 5 (Masculine-Feminine Interests) and 0 (Social Introversion-Extraversion) lack a corresponding RC scale because they measure components of personality rather than psychopathology.

(cont.)

Table 1
Validity and Clinical Scales of the MMPI and MMPI-2

MMPI Scales	MMPI-2 Scales
Validity Scales	***Validity Scales***
Lie (L)	Lie (L)
Infrequency (F)	Infrequency (F) Back Infrequency Scale (FB) Infrequency Psychopathology (Fp)
Correction (K)	Correction (K) Superlative Self Presentation (S) Variable Response Inconsistency (VRIN) True Response Inconsistency (TRIN) Symptom Validity Scale (FBS)
Clinical Scales	***Clinical Scales***
	Demoralization (RCd)
Hypochondriasis (1)	Hypochondriasis (1) Somatic Complaints (RC1)
Depression (2)	Depression (2) Low Positive Emotion (RC2)
Hysteria (3)	Hysteria (3) Cynicism (RC3)
Psychopathic Deviate (4)	Psychopathic Deviate (4) Antisocial Behavior (RC4)
Masculinity-Femininity (5)	Masculinity-Femininity (5)
Paranoia (6)	Paranoia (6) Ideas of Persecution (RC6)
Psychasthenia (7)	Psychasthenia (7) Dysfunctional Negative Emotions (RC7)
Schizophrenia (8)	Schizophrenia (8) Aberrant Experiences (RC8)
Hypomania (9)	Hypomania (9) Hypomanic Activation (RC9)
Social Introversion (0)	Social Introversion (0)

Note. Additional content and supplementary scales are reported in text.

Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF)

Ben-Porath and Tellegen (2008) developed the MMPI-2-RF as a restructured, 338-item version of the MMPI-2. The MMPI-2-RF did not replace the MMPI-2 but aimed to increase homogeneity within the Clinical scales. This was done in part by removing a common underlying factor of distress, titled "demoralization," that had been found to increase intercorrelations between the MMPI Clinical scales (Ben-Porath, 2012). The 338 items were collected from a subset of the MMPI-2 item pool and the normative sample used for the MMPI-2 was retained. However, data from the MMPI-2 normative sample's men and women were combined to create non-gendered norms to fit with contemporary trends.

Ben-Porath and Tellegen (2008) revised seven of the MMPI-2 Validity scales, which included VRIN-r, TRIN-r, F-r, Fp-r, FBS-r, L-r, and K-r. One new Validity scale, Infrequent Somatic Responses (Fs), was added to the MMPI-2-RF to detect overreporting of somatic complaints. The RC scales were revised and retained, but the test developers adopted a new hierarchical structure to the test. The nine RC scales fall under three Higher-Order scales, which target the same domains as the most common MMPI-2 Clinical scale elevation patterns. There are additional Substantive scales that fall under the Higher-Order scales, including five Somatic/Cognitive scales, nine Internalizing scales, four Externalizing scales, five Interpersonal scales, two Interest scales, and five revised PSY-5 scales. All scales of the MMPI-2-RF are presented in Table 2.

Table 2
Validity and Clinical Scales of the MMPI-2-RF

Validity Scales
Cannot Say (CNS)
Variable Response Inconsistency- revised (VRIN-r)
True Response Inconsistency- revised (TRIN-r)
Infrequent Responses- revised (F-r)
Infrequent Psychopathology Responses (Fs)
Symptom Validity- revised (FBS-r)
Uncommon Virtues- revised (L-r)
Adjustment Validity- revised (K-r)

Higher Order (H-O) Scales
Emotional/Internalizing Dysfunction (EID)
Thought Dysfunction (THD)
Behavioral/Externalizing Dysfunction (BXD)

Restructured Clinical (RC) Scales
Demoralization (RCd)
Somatic Complaints (RC1)
Low Positive Emotions (RC2)
Cynicism (RC3)
Antisocial Behavior (RC4)
Ideas of Persecution (RC6)
Dysfunctional Negative Emotions (RC7)
Aberrant Experiences (RC8)
Hypomanic Activation (RC9)

Specific Problem (SP) Scales	
<u>Somatic Scales</u>	<u>Internalizing Scales</u>
Malaise (MLS)	Suicidal/Death Ideation (SUI)
Gastrointestinal Complaints (GIC)	Helplessness/Hopelessness (HLP)
Head Pain Complaints (HPC)	Self-Doubt (SFD)
Neurological Complaints (NUC)	Inefficacy (NFC)
Cognitive Complaints (COG)	Stress/Worry (STW)
	Anxiety (AXY)
	Anger Proneness (ANP)
	Behavior-Restricting Fears (BRF)
	Multiple Specific Fears (MSF)
<u>Externalizing Scales</u>	<u>Interpersonal Scales</u>
Juvenile Conduct Problems (JCP)	Family Problems (FML)
Substance Abuse (SUB)	Interpersonal Passivity (IPP)
Aggression (AGG)	Social Avoidance (SAV)
Activation (ACT)	Shyness (SHY)
	Disaffiliativeness (DSF)

(cont.)

Table 2 (cont.)

Interest Scales
Aesthetic-Literary Interests (AES)
Mechanical-Physical Interests (MEC)
Personality Psychopathology Five (PSY-5) Scales
Aggressiveness- revised (AGGR-r)
Psychoticism- revised (PSYC-r)
Disconstraint- revised (DISC-r)
Negative Emotionality/Neuroticism- revised (NEGE-r)
Introversion/Low Positive Emotionality- revised (INTR-r)

Note. Adapted from Ben-Porath & Tellegen, 2011

Research on MMPI Versions with Different Cultural and Ethnic Groups

Following the substantial body of research suggesting that cultural context can shape individual experience (e.g., Kleinman, 1982; Draguns, 1995; Ryder et al., 2008; Yeung et al., 2004), efforts ensued to adapt and apply the MMPI across various cultural settings. This has included translating the test into other languages and developing new cultural norms when appropriate. Translations of the MMPI began as early as 1951 with the publication of the Cuban MMPI (Butcher & Williams, 2009), and the test became widely used in 46 countries by the mid 1970s (Butcher, 1996). Cross-cultural adaptations of the MMPI-2 similarly increased over the years due to the growing international demand for mental health services (Butcher, 1996). Translating and adapting the MMPI-2 for international use was less difficult than the original MMPI due to evolved adaptation standards, more relevant and appropriate items for assessing problems cross culturally, and a more diverse normative sample (Butcher, 2004). Thirty-two linguistic versions of the MMPI-2 became available within a few years of the test's publication and the test has since been translated into over 100 languages, including Arabic, Chinese, Farsi, Dutch, French, Greek, Hebrew, Hmong, Icelandic, Italian, Japanese, Korean, Norwegian, Russian, Spanish, Thai, Turkish, and Vietnamese (Butcher, 1996; Williams, 1987).

The MMPI has been widely used with various ethnic groups within the United States as well as cross-culturally. Because there was no minority representation in the original MMPI normative sample, questions regarding the appropriateness of the test's use with ethnic minority groups led to numerous studies examining the effects of ethnic differences on MMPI scores (Greene, 1987). Most of this research has historically been conducted on Black samples, but Hispanic, and Asian groups have also been studied (Butcher, 1996).

In comparing MMPI scores of Black and White individuals, research has revealed mixed findings. Studies have found significant differences on some MMPI scale scores between Black and White groups, particularly among non-clinical populations. In a review of 11 studies conducted on non-clinical populations, Gynther and Green (1980) found that Blacks scored significantly higher on scales F, 8, and 9 by around five to 10 T-score points. Dana and Whatley (1991) also found that Black individuals tended to score higher on scales F, 8 and 9, even when socioeconomic status was controlled. The fact that these scales were frequently used to identify serious pathology makes these scale elevations notable, as some have argued that Blacks could be overclassified as pathological (Duckworth & Anderson, 1995). However, not all studies found such notable differences. In a review of MMPI performance as a function of ethnic group membership, Greene (1987) reported few reliable differences between Black and White samples. Similarly, a study comparing MMPI performance of Black and White male alcoholics found no significant difference in performance between the two groups (Walters et al., 1984). In a meta-analysis performed on 25 comparative MMPI and MMPI-2 studies of 1,428 male African Americans versus 2,837 male European

Americans, Hall et al. (1999) found that African American men had higher scores than European American men on scales L, F, K, 1, 7, 8, and 9, while European Americans had higher scores on scales 2, 3, 4, 5, and 0. The same study also performed meta-analyses on 12 studies of 1,053 female African Americans versus 1,470 female European Americans and found that African American women had higher scores on scales L, F, 1, 2, 4, 5, 6, 7, and 8, and lower scores on K, 3, and 9 (Hall et al., 1999). Although significant, the differences found in both meta-analyses resulted in small aggregate effect sizes, with the largest being a Cohen's *d* of .21.

More critical than a mean score comparison between groups is the assessment of potential test bias. Differences between scores is not inherently reflective of test bias if they reflect actual group differences, in which case the test is functioning appropriately. McNulty et al. (1997) evaluated MMPI-2 bias among a sample of 123 African American clients from a community mental health center by comparing scores to those of 561 Caucasian clients, as well as conceptually related therapist rating scales. The study concluded that the significant differences found among a few of the MMPI-2 scales generally corresponded with content-congruent therapist ratings, indicating that the MMPI-2 is not biased in its use with African Americans. Research implications therefore suggest that the test is appropriate for use with African Americans, but clinical discretion should be used when interpreting elevations on scales F, 8, and 9 in non-clinical samples (Duckworth & Anderson, 1995).

MMPI studies have also been conducted using Hispanic samples. Hall et al. (1999) performed meta-analyses on 13 studies of 500 male Latino Americans and 1,345 European Americans using the MMPI and MMPI-2. Results suggested that Latino

Americans score higher than European Americans on scales L, F, and K, and lower on all Clinical scales, but only with small effect sizes. These differences are likely the result of differing test-taking attitudes between White and Hispanic samples due to cultural norms. In comparing Mexican and American norms using the MMPI-2, for example, Lucio et al. (2001) also found that Mexicans scored higher on the L scale. This suggests that Mexicans answer items in a manner reflecting a desire to appear favorably, which in turn can reduce scores on the Clinical scales. The study also found that Mexicans had higher scores on scale 1 and lower scores on scale 5. This is supported by research suggesting that collectivist cultures tend to experience stress more somatically than individualistic cultures and tend to have stricter gender norms (Kleinman, 1982; Triandis & Suh, 2002; Ryder et al., 2008; Kirmayer & Ryder, 2016).

Cultural variables such as language and acculturation may play a role in the test performance of Hispanic individuals as well. Researchers argue that if the examinee is fluent in English, use of the standard English language norms are most appropriate (Whitworth, 1988; Butcher et al., 2007), especially now that the MMPI-2 normative sample includes a subset of Hispanic individuals. Using the MMPI-2-RF, Benuto et al. (2020) administered the English version of the test to English-speaking participants and the Spanish-language version to Spanish speaking participants, consisting of 50 Latinx and 30 non-Latinx White primary care patients. The Latinx sample produced a greater number of invalid profiles, particularly in respect to elevated scores on VRIN-r, TRIN-r, and Fp-r. This could reflect difficulty understanding or interpreting test items. The consistent finding that Hispanic samples tend to score higher on the L scale (Canul & Cross, 1993; Lucio et al., 2001; Benuto et al., 2020) appears to be influenced by racial

identity attitudes and acculturation level. Canul and Cross (1993) found that Mexican Americans who had a more negative attitude toward their own ethnic group and a more positive attitude toward White Americans had lower T scores on the L scale. Less acculturated Mexican Americans were found to have higher L scale scores, suggesting that those with stronger ties to their Mexican heritage were less open to admitting social faults. This was further supported by lower K scale scores observed among Mexican Americans who had more positive attitudes of their own ethnic group. The tendency for Mexican American subjects to be less willing to acknowledge psychological distress could stem from the stigma attached to psychological adjustment present within collectivistic cultures (Kirmayer & Ryder, 2016).

Far fewer studies have been conducted on Asian American samples. International adaptations of the MMPI and MMPI-2 have demonstrated clinical utility in Asian countries (Butcher et al., 2003), but research with Asian Americans is lacking. This is troublesome due to differences in test performance that have been demonstrated among the studies that have examined Asian American groups. Rosik et al. (2017) compared the MMPI-2 scale scores of 114 Asian American male and female missionary candidates to their White counterparts and the MMPI-2 normative sample. Asian American women obtained higher scores on scale L compared to White women and the female normative sample (d = 1.40). Asian American men were found to have lower average scores on the F scale and higher scores on scales L (d = 1.05) and K (d = 1.26) compared to the normative sample. With regards to Clinical scales, Asian American women had higher scores on scale 2, 4, and 8 compared to the normative sample. Both men and women in the Asian group also scored higher on scale 0 (Rosik et al., 2017).

A small number of studies have looked exclusively at Asian ethnic groups. In a review of MMPI and MMPI-2 studies focused specifically on Chinese individuals in the United States, Kwan (1999) reported significant differences being found mostly on scales 0, 2, and 8, with Chinese participants obtaining higher scores. Another study comparing MMPI scores of 164 White and Japanese-American medical patients found that sex had a significant effect on scale scores (Tsushima & Onorato, 1982). Japanese-American men scored significantly higher than Japanese-American women on Clinical scales 1, 2, 3, 4, 5, 7, 8, and 9, and lower on scale 0.

Research on MMPI Versions with Middle Eastern Groups

The MMPI is well known in Arab countries and was originally translated into Arabic in the mid-1950s by Egyptian psychologists (Soliman, 1996; Meleika et al., 1959). However, there are a dearth of studies examining any edition of the MMPI with Middle Eastern samples. Those studies that have been done tend to focus on MMPI-2 and MMPI-2-RF use in Middle Eastern countries rather than with Middle Eastern individuals in the United States. Shkalim (2015), for example, examined the psychometric properties of the MMPI-2 and MMPI-2-RF Restructured Clinical scales in an Israeli sample of 100 men and 133 women in psychiatric settings. Results indicated that the RC scales had better reliability and convergent validity compared to their Clinical scale counterparts and replicated U.S. RC project findings (Tellegen et al., 2003), supporting the applicability of the test in a Middle Eastern country. Differences in the manifestations of mental disorders between genders was also found, specifically regarding antisocial behavior measured by RC4 (Shkalim, 2015). Israeli women appeared to display characteristics of antisocial personality disorder in terms of antisocial behavior manifested in patterns of poor

behavioral control, while Israel men experienced demoralization or distress as a primary feature of the disorder. Another study examining the MMPI-2-RF scales was conducted in Iran (Fard et al., 2021). The researchers administered the MMPI-2-RF to a community sample of 536 individuals in Tehran, Iran. The study found that scores on the Internalizing and Cognitive scales tended to be more elevated than Externalizing scales, which can likely be attributed to the Arab values of obedience, conservatism, and privacy (Abudabbeh, 2005).

Overview of the MMPI-3

The MMPI-2-RF (Ben-Porath & Tellegen, 2008) served as an interim step toward the development of the next edition of the test, the MMPI-3. As such, the structuring of the MMPI-3 closely resembles the MMPI-2-RF. An expanded version of the MMPI-2-RF (MMPI-2-RF-EX) that included all 338 MMPI-2-RF items along with 95 trial items was used to create the MMPI-3, with the goal of expanding the item pool and updating scales from previous editions of the test (Ben-Porath & Tellegen, 2020a). The final version of the test consists of 335 items, 263 of which were carried over from the MMPI-2-RF. Of the items carried over from the MMPI-2-RF, 39 were reworded to make the content clearer. The psychometric properties of the MMPI-3 scale scores were found to be psychometrically equivalent to those derived from the MMPI-2-RF-EX, a critical finding given that the MMPI-2-RF-EX was used to validate the MMPI-3 (Ben-Porath & Tellegen, 2020a; Hall et al., 2021). The MMPI-3 Technical Manual further declares the test to be valid and reliable in terms of its psychometric properties (Ben-Porath & Tellegen, 2020b).

The expanded version of the MMPI-2-RF was also used to develop new English- and Spanish-speaking normative samples. A total of 810 men and 810 women who represented the 2020 census's estimates for race, education, and age were included in the English-Language normative sample (Ben-Porath & Tellegen, 2020a). The test developers chose to continue with the use of nongendered norms, a decision supported by previous research indicating that there was little difference in test scores between men and women on the MMPI-2 (Ben-Porath & Forbey, 2003).

The MMPI-3 retained the hierarchical structure of the MMPI-2-RF and kept most of the scales (Ben-Porath & Tellegen, 2008). There are a total of 10 Validity scales, including the new Combined Response Inconsistency (CRIN) scale, as well as the VRIN, TRIN, F, Fp, Fs, FBS, RBS, L, and K scales that were carried over from the MMPI-2-RF. Eight RC scales, 26 Specific Problem scales, and the PSY-5 scales are all nested under the three Higher-Order scales of Emotional/Internalizing Dysfunction (EID), Thought Dysfunction (THD), and Behavioral/Externalizing Dysfunction (BXD). Like in the MMPI-2-RF, the Specific Problem scales are classified under the categories of Somatic/Cognitive, Internalizing, Externalizing, and Interpersonal (Ben-Porath & Tellegen, 2020).

The biggest difference observed in the MMPI-3 is the relocation of the RC3 (Cynicism) scale to the Externalizing Specific Problem scale set. Additionally, Family Problems (FML) was relocated from its previous location as one of the Interpersonal scales on the MMPI-2-RF to one of the Externalizing scales. Among the Interpersonal scales on the MMPI-3, Interpersonal Passivity (IPP) was renamed to Dominance (DOM)

and its scoring was reversed (Ben-Porath & Tellegen, 2020a). A summary of the MMPI-3 scales and descriptions of their core constructs can be found in Table 3.

Table 3
MMPI-3 Scales and Measured Descriptions

Scale Name	Characteristics Measured
Validity Scales	
Cannot Say (CNS)	Unanswered items
Combined Response Inconsistency (CRIN)	Inconsistencies related to both variable and fixed responding
Variable Response Inconsistency (VRIN)	Inconsistencies related to random response pattern
True Response Inconsistency (TRIN)	Inconsistencies related to fixed True or False responding
Infrequent Responses (F)	Infrequently endorsed psychological, cognitive, and somatic symptoms
Infrequent Psychopathology Responses (Fp)	Overreporting of problems
Infrequent Somatic Responses (Fs)	Somatic symptoms uncommonly endorsed by medical patients
Symptom Validity Scale (FBS)	Complement to F scale; noncredible symptomatic reporting
Response Bias Scale (RBS)	Inconsistencies related to overreporting of memory complaints
Uncommon Virtues (L)	Unrealistic moral virtues and characteristics
Adjustment Validity (K)	Defensiveness indicated by underreported maladjustment
Higher Order (H-O) Scales	
Emotional/Internalizing Dysfunction (EID)	Broad range of emotional and internalizing problems
Thought Dysfunction (THD)	Broad range of difficulties associated with thought dysfunction
Behavioral/Externalizing Dysfunction (BXD)	Broad range of behavioral problems

(cont.)

Table 3 (cont.)

Scale Name	Characteristics Measured
Restructured Clinical (RC) Scales	
Demoralization (RCd)	General unhappiness and life dissatisfaction, overwhelmed, helpless and ineffective
Somatic Complaints (RC1)	Somatic complaints, poor sense of physical well-being
Low Positive Emotions (RC2)	Anhedonia, dysphoria, social withdrawal
Antisocial Behavior (RC4)	Failure to conform to societal norms, acting-out behavior, and interpersonal conflict
Ideas of Persecution (RC6)	Suspicion and mistrust of others, paranoid beliefs
Dysfunctional Negative Emotions (RC7)	Inhibition due to negative emotionality including anxiety, anger, and fear
Aberrant Experiences (RC8)	Unusual thoughts and perceptions characteristic of disordered thinking
Hypomanic Activation (RC9)	High level of activity, racing thoughts, high energy, impulsivity, heightened mood
Specific Problem Scales	
<u>Somatic/Cognitive Scales</u>	
Malaise (MLS)	General sense of poor health and physical weakness
Neurological Complaints (NUC)	Various neurological problems including dizziness, numbness, weakness, and involuntary movement
Eating Concerns (EAT)	Problematic eating behaviors, binging, purging, restricting
Cognitive Complaints (COG)	Memory problems, intellectual deficits, poor concentration, confusion

(cont.)

Table 3 (cont.)

Scale Name	Characteristics Measured
Specific Problem Scales (cont.)	
Internalizing Scales	
Suicidal/Death Ideation (SUI)	Recent or past suicidal ideation or acts, preoccupation with death
Helplessness/Hopelessness (HLP)	Belief that life is a strain, overwhelmed
Self-Doubt (SFD)	Lack of confidence
Inefficacy (NFC)	Inability to make decisions and effectively deal with problems
Stress (STR)	Feeling nervous or preoccupied with stressors
Worry (SRY)	Rumination and preoccupation with disappointments
Compulsivity (CMP)	Repetitive and compulsive behavior, obsessions, perfectionistic tendencies
Anxiety-Related Experiences (ARX)	Generalized anxiety, intrusive ideation
Anger Proneness (ANP)	Easily angered, impatient
Behavior-Restricting Fears (BRF)	Fears that inhibit normal activity
Externalizing Scales	
Family Problems (FML)	Negative family experiences
Juvenile Conduct Problems (JCP)	History of undesirable juvenile conduct
Substance Abuse (SUB)	Past or current substance abuse
Impulsivity (IMP)	Unplanned conduct and poor impulse control
Activation (ACT)	Heightened excitation and energy level, mood swings, lack of sleep
Aggression (AGG)	Physically aggressive behavior
Cynicism (CYN)	Negative view of human nature

(cont.)

Table 3 (cont.)

Scale Name	Characteristics Measured
Specific Problem Scales (cont.)	
Interpersonal Scales	
Self-Importance (SFI)	Belief in self as extraordinary
Dominance (DOM)	Assertive, directness, possesses strong opinions
Disaffiliativeness (DSF)	Dislike of people, preference for being alone
Social Avoidance (SAV)	Does not enjoy social situations, social introversion
Shyness (SHY)	Uncomfortable around others, embarrassment, social anxiety
Personality-Psychopathology Five (PSY-5) Scales	
Aggressiveness (AGGR)	Aggressively assertive behavior
Psychoticism (PSYC)	Thought disturbance, unusual perceptual experiences
Disconstraint (DISC)	Impulsivity, acting-out behavior
Negative Emotionality/Neuroticism (NEGE)	Anxiety, insecurity, worry
Introversion/Low Positive Emotionality (INTR)	Social introversion, anhedonia, pessimism

Note. Adapted from Ben-Porath & Tellegen, 2020a

Research on MMPI Versions with College Students

The MMPI has been widely used in college settings for research purposes and for treatment planning in student counseling centers since its initial release in the early 1940s. The test provides valuable information regarding students' personality and psychological functioning, and it has also proven useful and effective in assessing various problematic behaviors among college students. These include nonsuicidal self-injury (Whitman et al., 2021), posttraumatic stress (Sapp, Farrell, Johnson, & Ioannidis, 1997),

and substance abuse (Thornton et al., 2020). Versions of the MMPI have also shown positive outcomes when incorporated into treatment sessions as part of a collaborative discussion with the student client. Students who received MMPI-2 verbal feedback while attending therapy at a college counseling center reported less symptomatic distress, better self-esteem, and more hope for symptom improvement following the feedback session (Finn & Tonsager, 1992). Thus, the test offers an array of utility among the college student population and can provide enriching details regarding students' psychological functioning.

Among the earliest studies to be done on use of the MMPI with college students, Brown (1948) aimed to determine whether there was a similar pattern of MMPI profiles among students by comparing the MMPI scores of 542 college freshmen at the University of Minnesota to the scores of other students from the same university who had taken the MMPI several years prior. The college populations used for comparison included 66 college graduates employed in an industrial business field, 110 female students enrolled in an introductory psychology course, and 82 junior medical students. Configuration and scale elevation across the various college samples were found to be similar, with scores generally ranging in the 50-60 T-score range. Furthermore, all of the profiles examined had their highest points on scales 3 and 9. A similar pattern of scores was found by Goodstein (1954), in which the MMPI profiles of 408 freshman males from 8 different colleges were examined. Scores once again were in the 50-60 T-score range and peaks were consistently found on scales 3, 4, and 9. Drasgow and McKenzie (1958) took these findings a step further by examining whether the MMPI could predict successful college graduation among students. The study found that 75% of the non-

graduate sample had at least one scale equal to or greater than a T-score of 70 compared to only 25% of the graduate sample, indicating that students who failed to graduate frequently had poorer psychological functioning. The non-graduate sample also displayed peaks on scales 4 and 9.

The aforementioned research on the original MMPI revealed the consistent finding that college students tended to score one to one-and-a-half standard deviations above normative sample means on the Clinical scales. This implied that college students were more deviant in their responses to the MMPI compared to the general adult population, leading some to argue that interpretive caution should be used (Brown, 1948), and new norms for college students were warranted (Goodstein, 1954). It is important to note, however, that this pattern is likely due to several factors unrelated to increased psychopathology, such as an increased number of omitted responses related to vague test administration instructions (Butcher et al., 1990).

MMPI research with college student samples continued with the MMPI-2 due to the test's widespread use in college counseling centers and in research using college student samples. Because a new normative sample was developed for the MMPI-2, additional research was done to examine whether college students differed from these norms in a manner similar to that of the original MMPI norms. Butcher et al. (1990) found that scale elevations on most Validity and Clinical scales among 515 male and 797 female college students were very similar to the MMPI-2 normative sample. The greatest differences between the two samples appeared on scales 7 (Pt), 8 (Sc), and 9 (Ma), which was consistent with previous findings that younger individuals tend to score higher on these scales (Butcher, Jeffrey, et al., 1990) In terms of stability and internal consistency,

Matz et al. (1992) found moderate to high stability coefficients ranging from .60 to .90 and alpha coefficients ranging from .39 to .91 among a sample of 128 college students retested after a 3-week interval. These numbers were consistent to those reported by Butcher et al. (1990). Together, these findings suggested that the MMPI-2 norms are appropriate for use with college students and therefore, a new set of norms designed specifically to be used with college students was not warranted.

McCurdy and Kelly (1997) examined correlations between the MMPI-2 Low Self-Esteem (LSE) Content scale scores of 115 undergraduate students with the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Coopersmith Self-Esteem Inventory-Adult Form C (Coopersmith, 1981). Findings indicated that scores on the LSE scale were significantly negatively correlated with Rosenberg Self-Esteem Scale scores (r=-.61) and Coopersmith Self-Esteem Inventory scores (r=-.67). The inverse relationship between the LSE scale scores and measures of positive self-esteem indicates good convergent validity.

Correlate studies with college students have also examined the MMPI-2 RC scales. Sellbom et al. (2006) administered the MMPI-2 to 228 men and 522 women from a university counseling center and gathered therapist ratings on multiple variables. Findings indicated that the intercorrelations among the RC scales were lower than those among the Clinical scales, and that the RC scales had lower correlations with Demoralization. This was a relevant finding given that one of the developmental aims of the RC scales was to remove the common underlying factor of distress that had been previously found to increase intercorrelations between the MMPI Clinical scales (Ben-Porath, 2012). Additional findings from the study indicated that the RC scales had the

highest correlations with alternative measures of the RC scale constructs (Sellbom et al., 2006). For example, Low Positive Emotions (RC2) was strongly correlated with Introversion (INTR; r = .82), Ideas of Persecution (RC6) was strongly correlated with Ideas of External Influence (Pa_1; r= .77), and Aberrant Experiences (RC8) was strongly correlate with Bizarre Mentation (BIZ; r= .89). In comparing RC scale scores to therapist ratings, the study found that the RC scales had their strongest correlations with conceptually relevant criteria and were uncorrelated with nonrelevant criteria.

Among MMPI-2-RF correlate studies with college students, Forbey et al. (2010) used related criterion measures to establish correlates on the following MMPI-2-RF Specific Problem and Interest scales: Anger Proneness (ANP), Interpersonal Passivity (IPP), Cognitive Complaints (COG), Social Avoidance (SV), Disaffiliativeness (DSF), Aesthetic Literary Interests (AES), and Mechanical-Physical Interests (MEC). In addition to the MMPI-2-RF, 805 undergraduate students were administered the Anger Idioms Scale (AIS; Malgady et al., 1996), the Assertiveness Self-Report Inventory (ASRI; Herzberger et al., 1984), the Bem Sex Role Inventory (BSRI; Bem, 1974), the Cognitive Failures Questionnaire (CFQ; Broadbent et al., 1982), the Social Avoidance and Distress Scale (SADS; Watson & Friend, 1969), and the Social Fears Scale (SFS; Raulin & Wee, 1984). The researchers found that 5.8% of the individual correlations calculated between the selected MMPI-2-RF scales and related criterion measures met or exceeded a large effect size (r > .50), indicating good convergent validity. Specifically, AIS scores were strongly associated with BXD (r = .53 in men; r = .54 in women), ANP (r = .56 in men; r = .54 in women), AGG (r = .64 in men; r = .62 in women), and AGGR-r (r = .50 in men; r = .64 in women; Forbey et al., 2010).

The MMPI-2-RF has also been found to be a useful instrument in assessing personality psychopathology. Sellbom et al. (2013) examined correlations between MMPI-2-RF scale scores of 628 university students and the Personality Inventory for the DSM-5 (PID-5; Krueger et al., 2012). The PID-5 is a diagnostic tool that conceptualizes personality disorders across five-dimensional trait domains: Negative Affectivity, Detachment, Antagonism, Disinhibition, and Psychoticism. Sellbom et al. (2013) found that the MMPI-2-RF internalizing scales reflected the Negative Affectivity domain well, with the EID (r = .68), RCd (r = .67), and RC7 (r= .71) scales having the strongest correlations. In terms of the Detachment domain of the PID-5, the MMPI-2-RF scales EID (r= .63), RCd (r = .61), and RC2 (r = .55) had the strongest correlations. The BXD (r =.53), RC9 (r = .60), and AGG (r = .52) scales were found to be the best predictors of PID-5 Antagonism. The MMPI-2-RF externalizing scales of BXD (r = .51), RC4 (r = .48), RC9 (r = .50), SUB (r = .45), AGG (r = .34), and ACT (r = .33) were the best predictors of the PID-5 Disinhibition domain. Finally, the scales found to best predict the Psychoticism domain included THD (r = .54), RC8 (r = .63), and COG (r = .55).

Because of the recency of its publication, studies utilizing the MMPI-3 with college samples are just beginning to emerge. One recent study by Sellbom (2021) examined the Self-Importance (SFI) scale of the MMPI-3 using a sample of 645 university students. In addition to the MMPI-3, the sample was administered several other personality measures including the Personality Diagnostic Questionnaire- Fourth Edition (PDQ; Hyler, 1994), Assessment of Disordered Personality-IV (ADP-IV; Schotte et al., 1998), Narcissistic Grandiosity Scale (NGS; Rosenthal et al., 2020), Hypersensitive Narcissism Scale (HSNS; Hendin & Cheek, 1997), Narcissistic Admiration and Rivalry

Questionnaire (NARQ; Back et al., 2013), and the International Personality Item Pool Measure of the 60-Item Five Factor Model (IPIP-NEO-60; Maples-Keller et al., 2019). In terms of criterion validity, the MMPI-3 SFI scale showed moderate-to-large correlations with PDQ (r = .37), ADP-IV (r = .32), NARQ (r = .55), and NGS (r = .60) scale scores, indicating that the SFI is correlated with measures of grandiosity as expected. The SFI scale was only weakly correlated with HSNS (r = .02), leading Sellbom (2021) to conclude that the SFI scale is not associated with measures of vulnerable narcissism. Therefore, the SFI scale may not provide the best single measurement of narcissistic personality disorder in a college setting and should be used in tandem with other measures.

Another MMPI-3 study by Vanousová et al. (2021) aimed to validate the Eating Concerns (EAT) scale using a sample of 396 university students. Participants were administered the MMPI-3, the Eating Pathology Symptoms Inventory (EPSI; Forbush et al., 2013), the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994), the Eating Disorder Diagnostic Scale (EDDS; Stice et al., 2000), the Binge-Eating Scale (BES; Gormally et al., 1982), and the Body Image- Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013). Positive correlations were found between the MMPI-3 EAT scale and all other measures, indicating that higher scores on other measures of disordered eating were associated with higher scores on the EAT scale. Specifically, moderate to large correlations were found with scales measuring binge eating, purging, restrictive eating, and weight concerns, indicating good criterion validity. Vanousová et al. (2021) also found evidence of discriminant validity based on correlation and multiple regression analyses. The MMPI-3 EAT scale was associated only with

symptom dimensions essential for diagnosing eating disorders, such as body dissatisfaction, weight concerns, restrictive eating, purging, and binge eating. It was not found to be significantly associated with negative attitudes towards obesity or excessive exercise, which are related phenomena but not essential for eating disorder diagnoses. Finally, Vanousová et al. (2021) demonstrated incremental validity of the EAT scale above and beyond the Specific Problem scales concerning the measurement of eating disorders symptoms.

Research on MMPI Versions with College Students from Specific Ethnic Groups in the United States

Several studies with versions of the MMPI have been conducted with college students from various ethnic groups in the United States, including African American, Hispanic, and Asian students.

African American Student Samples

Studies utilizing African American student samples have been conducted with the MMPI, MMPI-2, and MMPI-2-RF. Among the earlier MMPI studies, Whatley et al. (2003) examined the relationship between racial identity and MMPI scores among 50 African American male college students. The researchers administered the Racial Identity Attitude Scale-Black (RIAS-B; Helms & Parham, 1996) and selected five MMPI scales that had previously been found to show group differences or was conceptually relevant to racial identity issues: F, 4, 6, 8, and 9. Using a stepwise multiple regression, Whatley et al. (2003) found that specific scales on the RIAS-B were predictors of the selected MMPI scale scores. Specifically, the Immersion-Emersion scale of the RIAS-B was a predictor of scale 4 ($R^2 = .12$, $F(1, 48) = 6.72$, $p < .02$) and scale 9 ($R^2 = .12$, $F(1, 48) = 6.28$, p

<.02), and the RIAS-B Internalization scale was a predictor of MMPI scale 6 (R^2 = .11, F(1, 48) = 5.84, p <.02). Based on these findings, Whatley et al. (2003) concluded that slight scale elevations on scales 4, 9, and 6 could be associated with a normal aspect of African American racial identity development.

Other studies have focused on female African American students. Reed et al. (1996) measured depressive symptoms in a sample of 78 African American female college students using the MMPI-2 and the Beck Depression Inventory (BDI; Beck et al., 1961). Results indicated that depressive symptoms were present in 58% of the sample based on BDI results, whereas the MMPI-2 scale 2 identified only 23% of the total sample as experiencing depression. The BDI also identified the individuals making up the 23% as depressed, leading the researchers to conclude that the MMPI-2 is a more conservative measure of depression among African American female college students.

Given the mixed findings previous research has shown concerning MMPI score differences for African Americans versus Whites, it is not surprising that comparison studies using the MMPI-2-RF have also been conducted on college student samples. Gonzalez et al. (2019) compared the MMPI-2-RF scores of White and African American students attending a Midwestern college. The researchers found significant differences in mean scores between White and African American students on 28 of the 51 MMPI-2-RF scales. Among those that reached clinical relevance, African American students had an average T-score that was five points higher than White students on the Higher Order scales THD and BXD. Differences of medium effect sizes were also found on RC4 (d = .47), RC6 (d =.43), and RC8 (d = .44), with African American students scoring an average of 4.1 to 5.2 T-points higher than White students. African American students

were also found to be more likely to have elevated scores on RC3 and RC8. Among the Internalizing scales, African American students scored significantly higher on Multiple Specific Fears (MSF) by 5.5 T-points with a medium effect size (d = .68). African American students also scored 6.5 T-points higher on the Externalizing scale Juvenile Conduct Problems (JCP; d = .77). Finally, African American students scored 4.4 T-points higher on the PSY-5 scale Aggressiveness (AGGR-r; d = .45) and 5.8 T-points higher on Psychoticism (PSYC-r; d = .52). These findings that African Americans tend to score higher on scales measuring externalizing behaviors, interpersonal suspiciousness, unusual thought processes, and feelings of alienation led Gonzalez et al. (2019) to conclude that these elevations are likely representing manifestations of cultural mistrust and discrimination as opposed to higher psychopathology.

Mexican American Student Samples

Hispanics/Latinos account for the second largest minority group in the United States following Blacks (U.S. Bureau of Census, 2019), making studies utilizing Hispanic college student samples increasingly relevant. Early studies with the MMPI include research by Reilley and Knight (1970), who compared scores of Mexican American and non-Mexican college students attending a southwestern university. Results found that the L scores of the Mexican American group were significantly higher, which the researchers suggest could indicate stricter or more conventional attitudes. Male Mexican American students also scored higher than their counterparts on scales 7, 8, and 0. As suggested in other minority studies, elevations in scales measuring anxiety, interpersonal suspiciousness, and feelings of alienation could reflect aspects of cultural mistrust and issues relating to acculturation (Gonzalez et al., 2019).

Another study evaluating MMPI differences between Mexican American and White college students was done by Montgomery and Orozco (1985). The researchers compared the MMPI scores of 365 Mexican American and White college students. When acculturation, age, and socioeconomic status was left uncontrolled, significant differences were found on 10 of the 13 MMPI scales. However, once they were controlled, the only significant differences were on scales L and 5. Both scale scores of Mexican American women were significantly higher than their counterparts, suggesting that they had fewer traditional gender-role interests and were more likely to deny common faults to appear more virtuous.

Canul and Cross (1994) also considered acculturation's influence on Mexican American's scores using the MMPI-2. The researchers administered the Acculturation Rating Scale for Mexican Americans (ARMSA; Cuellar et al., 1980), the RIAS-B (Helms & Parham, 1996), and the MMPI-2 to 51 Mexican American students attending Washington State University. As Canul and Cross (1994) hypothesized, those who had acculturation levels that were more Mexican-oriented had significantly higher L scores (M = 58.81) compared to those who were more acculturated (M = 49.10), suggesting a greater denial of common shortcomings. Acculturation was not related to scales K or 5, but racial identity attitudes were found to influence scale K scores. Specifically, those who had a more positive view of their own ethnic group and a more negative view of Anglo-Americans had higher scores on the K scale, suggesting that they were less willing to admit psychological difficulty.

Asian American Student Samples

Very few MMPI studies have been conducted with Asian samples in general, with even fewer focusing on Asian or Asian American college students. Of the few studies that have been done, Sue and Sue (1974) compared MMPI scores of Asian American and non-Asian students at a student health psychiatric clinic at a west coast university. The study specifically looked at 46 Chinese and Japanese students compared to 120 non-Asian students. Comparisons of MMPI scores revealed that Asian college men had significantly higher scores on scales L, F, 1, 2, 4, 6, 7, 8, and 0 than their control male counterparts. However, Asian women only had higher scores on scales L, F, and 0 compared to their control female counterparts. Sue and Sue (1974) further reported that the overall pattern of scores for Asian and non-Asian students was similar, but that the severity was greater for the Chinese and Japanese students.

An MMPI-2 study done by Stevens et al. (1993) compared scores of foreign Chinese students to a matched sample of Caucasian students and to normative data on American college students. T-tests were used to evaluate group differences among the Validity and Clinical scale scores. Results revealed that Chinese men had higher scores on scale 0 compared to Caucasian men and to the published norms for American college students (Butcher et al., 1990). Chinese women had higher scores on scale L compared to Caucasian women and the published American college student norms. Chinese women also had higher scores on scales K, 2, and 3, and lower scores on scale 5 compared to the female college norm group.

Middle Eastern College Student Samples

As previously discussed, there are few studies examining any edition of the MMPI with Middle Eastern samples; studies that have been done have focused on the MMPI, MMPI-2, and MMPI-2-RF use in Middle Eastern countries rather than with Middle Eastern individuals in the United States. For example, Torki (1985) examined correlations between femininity and fear of success within a sample of Arab undergraduate women in Kuwait, Lebanon, Qatar, and Iraq using an Arabic version of the Masculinity-Femininity (MF) subscale of the MMPI. The study concluded that femininity was not associated with fear of success, as no differences were found between measures of fear of success and high or low scores on the MF scale.

Other studies have focused on Muslim undergraduate samples, although these samples were not exclusively Middle Eastern. One such study by Bagby et al. (2020) examined the traditional background hypothesis among Canadian undergraduate students identifying as Muslim, 18.5% of whom were Middle Eastern. The traditional background hypothesis posits that those from traditional Christian faith-based groups tend to produce elevations on the L scale of all versions of the MMPI and Bagby et al. (2020) hypothesized that stronger traditional Muslim faith values would also be correlated with scores on the L-r scale of the MMPI-2-RF. The study concluded that those with stronger Muslim faith-based values produced L-r scores 0.6 standard deviations above the normative mean, providing support for the traditional background hypothesis. As of now, no published studies or doctoral dissertations could be found examining MMPI scores of a Saudi Arabian college sample within the United States.

Chapter 3: Rationale and Hypotheses

Diversity in the United States population has been steadily increasing over the past several decades. As ethnic minorities are exposed to American culture, their process of acculturation and cultural beliefs can influence how well they cope with the stress of belonging to a minority population. Stressors unique to these groups include discrimination, prejudice, homesickness, and language difficulty. These stressors can in turn lead to greater psychological difficulty and a greater need for mental health services. While personality tests such as the MMPI have proven to be valuable for aiding diagnosis and treatment directions, relatively few studies to date have been conducted with specific ethnic minority groups, particularly newer immigrant groups of Hispanic and Asian individuals. This is problematic as tests that were developed in the United States with predominantly Caucasian normative samples may not be generalizable to every ethnic group, given what is known about culture's ability to shape personality.

International students are a uniquely vulnerable population in the sense that they are subject to stressors common to both domestic college students and ethnic minorities, including increased anxiety concerning academic performance and finances, as well as emotional difficulties stemming from isolation and perceived discrimination. As of 2021, there are over 57,000 students from the Middle East currently attending school in the United States (IIE, 2021). Over one-third of these students come from Saudi Arabia. There have been very few published studies examining any edition of the MMPI with Middle Eastern samples and there are currently no published studies specifically examining a Saudi Arabian international student sample. With the recent publication of the MMPI-3, there is a need to compare score patterns for Saudi Arabian international

students to White domestic students, as well as examine how acculturation and experiences of perceived discrimination may impact those scores.

The current study had several purposes. First, the study aimed to develop reference group data for Saudi Arabian international students using the MMPI-3. This would allow for a more accurate point of comparison when interpreting Saudi Arabian international students' MMPI-3 test scores in subsequent applications of this measure.

The second purpose of the study was to compare MMPI-3 scores of a Saudi Arabian student sample with those of a domestic White American student sample to investigate the impact of cultural background on test scores. It was hypothesized that Saudi Arabian international students would score significantly higher on several MMPI-3 scales than White American students, based on previous research suggesting a tendency for many ethnic minorities to score higher on various scales.

A third purpose of the study was to identify the MMPI-3 scales that are particularly strongly correlated with perceived prejudice. Because this was done on an exploratory basis, no specific MMPI-3 scales were hypothesized to be correlated with perceived prejudice. However, it was expected that the obtained correlates would reflect the negative experiences found to be associated with higher levels of perceived prejudice.

Assuming a significant total effect was found between certain MMPI-3 scales and perceived prejudice among the Saudi Arabian sample, a final purpose the study was to determine whether acculturation mediated this relationship. It was hypothesized that acculturation would serve as a mediator between perceived prejudice and MMPI-3 scales.

Chapter 4: Methods

Participants

The participants for this study consisted of two samples. The primary sample consisted of 47 Saudi Arabian international college students attending a medium-sized, private university located in central Florida. Inclusion criteria for this sample required that participants were at least 18 years old, attending school in Florida as an international student from Saudi Arabia, and produced a valid MMPI-3 profile. An MMPI-3 profile was considered to be valid for this sample if it consisted of a Cannot Say (?) raw score of ≤15, CRIN < T score 80, VRIN < T score 80, and a TRIN < T score 80. These criteria ensured that only participants who demonstrated minimal response omissions and responded in a consistent, unbiased manner were included in the present study. Three participants from the initial sample were excluded from analyses due to invalid MMPI-3 profiles related to excessive response inconsistency and fixed, biased responding in the affirmative direction, bringing the final sample to $N = 47$. Participants in this sample were between the ages of 21 and 41 ($M = 26.70$, $SD = 5.18$) and predominantly identified as Arab ($n = 39$; 83%). Nearly all participants in this sample identified as Muslim except for one who chose not to disclose their religion. All participants reported attending school on a student visa and a majority had spent between 2 to 5 years in the United States ($M = 4.06$, $SD = 2.70$). This sample was predominantly composed of male ($N = 35$) senior and graduate students in aeronautical science and engineering programs. A majority of participants reported no prior mental health diagnosis ($n = 42$; 89.4%) and were not currently receiving counseling ($n = 43$; 91.5%). Regarding level of adjustment to school and level of stress, participants typically rated their level of adjustment as high ($n = 23$;

48.9%), very high (*n* = 11; 23.4%), or moderate (*n* = 11; 23.4%), and their level of stress as moderate (*n* = 22; 46.8%) to low (*n* = 13; 27.7%) .

The comparison sample consisted of 71 Caucasian American college students attending a medium-sized, private technical university located in central Florida. Inclusion criteria for this sample required that participants were at least 18 years old, American, identified as Caucasian, and produced a valid MMPI-3 profile. MMPI-3 inclusion criteria for the comparison sample were the same as the primary Saudi Arabian sample and consisted of a Cannot Say (?) raw score of ≤15, and T scores < 80 on CRIN, VRIN, and TRIN. Participants in this sample were between the ages of 18 and 45 (*M* = 21.73, *SD* = 6.50). The sample was balanced between male (*n* = 36, 50.7%) and female (*n* = 34; 47.9%) participants. Most identified as Christian (*n* = 36; 50.7%), and all but one identified English as their first language. Table 4 below provides more detailed demographic information regarding both the primary Saudi Arabian student sample and the comparison Caucasian American student sample.

(cont.)

Table 4
Student sample demographics

	Saudi Arabian sample (N = 47)		Caucasian American sample (N = 71)	
Demographic variable	*n*	Percent	*n*	Percent
Gender				
Male	35	74.5%	36	50.7%
Female	12	25.5%	34	47.9%
Non-binary/third gender	0	0%	1	1.4%
Ethnicity				
Arab	40	85.1%	0	0%
Caucasian	4	8.5%	71	100%
Asian	2	4.3%	0	0%
Other	1	2.1%	0	0%
Religion				
Muslim	46	97.9%	0	0%
Christian	0	0%	36	50.7%
Not Religious	0	0%	22	31%
Agnostic	0	0%	4	5.6%
Atheist	0	0%	4	5.6%
Spiritual	0	0%	3	4.2%
Jewish	0	0%	1	1.4%
Unitarian	0	0%	1	1.4%
Prefer Not to Say	1	2.1%	0	0%
Primary Language				
English	0	0%	70	98.6%
Arabic	47	100%	0	0%
Turkish	0	0%	1	1.4%
Year in School				
Freshman	6	12.8%	44	62%
Sophomore	5	10.6%	10	14.1%
Junior	7	14.9%	8	11.3%
Senior	12	25.5%	6	8.5%
Graduate student	17	36.2%	3	4.2%

(cont.)

Table 4 (cont.)

	Saudi Arabian sample (N = 47)		Caucasian American sample (N = 71)	
Demographic variable	*n*	Percent	*n*	Percent
Major				
Aeronautics/Aviation	15	31.9%	15	21.5%
Biology/Life Sciences	5	10.6%	4	5.6%
Business	1	2.1%	11	15.5%
Computer Science/Math	5	10.6%	3	4.2%
Education	2	4.2%	0	0%
Engineering	17	36.2%	14	19.7%
Law	0	0%	1	1.4%
Psychology/Liberal Arts	2	4.2%	23	32.4%
Level of Adjustment to College				
Very low	0	0%	1	1.4%
Low	2	4.3%	6	8.5%
Moderate	11	23.4%	32	45.1%
High	23	48.9%	21	29.6%
Very high	11	23.4%	11	15.5%
General Level of Stress				
Very low	1	2.1%	2	2.8%
Low	13	27.7%	8	11.3%
Moderate	22	46.8%	36	50.7%
High	7	14.9%	19	26.8%
Very high	4	8.5%	6	8.5%
Prior Mental Health Diagnoses				
Yes	5	10.6%	22	31%
No	32	89.4%	49	69%
Currently Receiving Counseling				
Yes	4	8.5%	18	25.4%
No	43	91.5%	53	74.6%

As illustrated in Table 4, the Caucasian American comparison sample was comparable to the Saudi Arabian sample regarding average level of stress. However, the Caucasian sample was younger, at an earlier stage in academic career, more evenly dispersed between gender groups, and reported a slightly lower level of adjustment to

college than the Saudi Arabian sample. In terms of mental health history, a larger number of the Caucasian sample reported prior mental health diagnoses and a greater proportion were currently receiving counseling services compared to the Saudi Arabian sample.

Instruments

MMPI-3 (Ben-Porath & Tellegen, 2020a)

The MMPI-3 was the central measure of this study. Sound psychometric properties have been reported in the MMPI-3 Technical Manual based on data from relevant samples including the MMPI-3 normative sample, a community mental health sample, and a male prison inmate sample (Ben-Porath & Tellegen, 2020b). For men in the normative sample, test-retest reliability coefficients ranged from .47 to .87 for the Validity scales, .76 to .94 for the Higher-Order (H-O) and Restructured Clinical (RC) scales, .68 to .90 for the Somatic/Cognitive and Internalizing scales, .72 to .94 for the Externalizing and Interpersonal scales, and .72 to .93 for the Personality Psychopathology Five (PSY-5) scales. For women, test-retest reliability coefficients ranged from .53 to .87 for the Validity scales, .81 to .94 among the H-O and RC scales, .76 to .90 for the Somatic/Cognitive and Internalizing scales, .73 to .92 for the Externalizing and Interpersonal scales, and .79 to .92 for the PSY-5 scales. Overall, this data suggests adequate temporal stability of test scores. Standard errors of measurement (SEM) expressed in T-score values ranged from 2 to 7 in men and 3 to 6 in women across all scales, both reflecting acceptable ranges of systematic error.

Regarding internal consistency reliability, the MMPI-3 Technical Manual presents Cronbach's alpha coefficients for men and women in the normative sample (Ben-Porath & Tellegen, 2020b). For men, Cronbach's alpha coefficients ranged from .31 to .76 for

the Validity scales, .69 to .91 for the H-O and RC scales, .40 to .86 for the Somatic/Cognitive and Internalizing scales, .55 to .79 for the Externalizing and Interpersonal scales, and .67 to .86 for the PSY-5 scales. Alpha coefficients for women ranged from .36 to .78 for the Validity scales, .71 to .92 for the H-O and RC scales, .42 to .85 for the Somatic/Cognitive and Internalizing scales, .54 to .81 for the Externalizing and Interpersonal scales, and .68 to .88 for the PSY-5 scales. The MMPI-3 scales are thus comprised of items that are adequately intercorrelated with each other within relevant scale sets. SEMs ranged from 3 to 8 for both men and women across scales, again demonstrating acceptable rates.

Test score validity of the MMPI-3 validity scales was established in part through associations between the MMPI-3 and MMPI-2-RF versions of these scales (Ben-Porath & Tellegen, 2020b). Internal correlations were found to be in the expected directions for the MMPI-3 Validity scales and functioned similarly compared to their MMPI-2-RF counterparts. Specifically, the MMPI-3 CRIN, VRIN and TRIN scales were found to be comparable indicators of inconsistent responding to the VRIN-r and TRIN-r scales of the MMPI-2-RF. The updated F, Fp, and Fs scales were found to be interchangeable to the F-r, Fp-r, and Fs scales of the MMPI-2-RF in the detection of over-reporting of problems. The L and K scales also function similar to the L-r and K-r scales of the MMPI-2-RF and were deemed effective in detecting under-reporting response patterns.

Construct validity was established through external correlates of the MMPI-3 substantive scales in community outpatient mental health, private practice outpatient, spinal surgery candidate, disability claimant, police candidate, prison inmate, and college student samples (Ben-Porath & Tellegen, 2020b). The replicated correlates established

for the MMPI-3 scales with these samples were overall meaningful and in support of convergent and discriminant validity, meaning that these scales adequately measure the constructs they were intended to measure. Correlations between the MMPI-3 and MMPI-2-RF substantive scales also suggest that the MMPI-3 scales are adequately associated with similar measures on the MMPI-2-RF.

American-International Relations Scale (AIRS; Roysircar & Plake, 1991)

The AIRS is a 34-item multidimensional self-report questionnaire designed to measure the factors of perceived prejudice, acculturation, and language use among international groups residing in the U.S. (Roysircar & Plake, 1991). Items were either formulated from previous international student studies or adapted from the Acculturation Rating Scale for Mexican Americans (Cuellar et al., 1980), Bogardus' Social Distance Scale (Buros, 1970), and the Anti-Semitism (A-S) Scale (Levinson & Sanford, 1944).

Psychometric validity of the AIRS was established using a sample of 481 completed questionnaires from international students, scholars, academics, and permanent U.S. residents at a major Midwestern university (Roysircar & Plake, 1991). Based on factor analyses, three factors emerged as most salient and accounted for 34.4% of total variance, resulting in the development of three subscales: Perceived Prejudice, Acculturation, and Language Usage. Moderate correlations were found between the Perceived Prejudice and Acculturation subscales (r = .44), as well as the Language Usage and Acculturation subscales (r = .42). In terms of internal consistency reliability, Roysircar and Plake (1991) reported strong alpha coefficients of .89 for the full scale, and alpha coefficients of .88, .79, and .82 for the Perceived Prejudice, Acculturation, and Language Usage subscales, respectively.

There are 20 items in the Perceived Prejudice subscale, which includes content related to international individuals' experiences of stereotypes, discrimination, and social isolation (Roysircar & Plake, 1991). Factor loadings for the Perceived Prejudice subscale ranged from .33 to .63 and their item-to-total-subscale correlations ranged from .31 to .62. The Acculturation subscale has 11 items, with factor loadings ranging from .38 to .60 and item-to-total-subscale correlations between .23 and .65. Items of the Acculturation subscale reflect international individuals' preference for relationships, group membership, and culture. These two scales were used in the current study. The Language Usage subscale has three items with factor loadings ranging from .77 to .83 and item-to-subscale correlations of .66 to .74. These items reflect language used for communicating and processing thoughts. Overall, the data reported by Roysircar and Plake (1991) suggests that the AIRS adequately assesses international people's perception of their adjustment to a white-dominant society in terms of acculturation, perceived prejudice, and language usage.

Procedure

The study began upon approval from the Institutional Review Board (IRB) of Florida Institute of Technology and the Doctoral Research Project committee. Saudi Arabian student participants were recruited through the Saudi Students' Union at Florida Institute of Technology and the University of Southern Florida. White domestic students and additional Saudi Arabian student participants were recruited through the university-wide electronic mailing listserv for students (i.e., fitforum) at Florida Institute of Technology. All participants were required to provide informed consent through

documentation signed virtually through DocuSign prior to their participation in the study. The informed consent form is included in Appendices A and B.

The MMPI-3 was administered through the Q Global online platform with virtual monitoring using the Zoom platform. Teleassessment of this kind follows the guidelines for teleassessment suggested by Wright et al. (2020) and has been found to be comparable to face-to-face assessment in a number of studies (Brearly, 2017; Galusha-Glasscock et al., 2016; Harrell et al., 2014; Smith et al., 2017; Wadsworth et al., 2018; Wright, 2018). A brief demographic questionnaire, included in Appendices C and D, was administered virtually through the online survey platform, Qualtrics. The AIRS was also administered virtually through Qualtrics to the Saudi Arabian student sample only. Both the demographic questionnaire and the AIRS were formatted to allow participants to type their responses into the virtual document. Following participants' completion of the informed consent, MMPI-3, and questionnaires, all identifying information for each participant was secured and kept confidential. All data analyses were conducted using IBM Statistical Package for the Social Sciences (SPSS). Participants were only identified using an alpha-numerical code in the SPSS database to ensure confidentiality of test scores. As an incentive for participating in the study, all participants were entered into a random drawing for a chance to win a $25 gift card. A total of 20 gift cards were distributed.

Data Analyses

Preliminary data analyses consisted of computing descriptive statistics, including means/standard deviations and percentages, to describe both samples' demographics. Means and standard deviations of MMPI-3 scale scores were also derived separately for

each sample. Levels of acculturation and perceived prejudice were computed for the Saudi Arabian participants in terms of means and standard deviations derived from the AIRS measure.

Central analyses were directed towards comparing MMPI-3 scores between the Saudi Arabian and White American student samples. These analyses consisted of Multivariate Analyses of Variance (MANOVAs) followed by univariate Analyses of Variance (ANOVAs). Pearson correlation coefficients were calculated to determine the magnitudes and directions of correlations between MMPI-3 scores and perceived prejudice scores for the Saudi Arabian sample. Finally, mediation analysis was conducted by way of simple linear regression to determine the potential mediating effect of acculturation on the relationship between perceived prejudice and MMPI-3 scores for the Saudi Arabian sample.

Chapter 5: Results

Preliminary analyses consisted of deriving means and standard deviations of the MMPI-3 scale scores for the Saudi Arabian international student sample and the Caucasian American comparison sample, shown in Table 5.

Table 5
Means and standard deviations of MMPI-3 scale scores for Saudi Arabian sample and Caucasian American comparison sample

	Saudi Arabian sample (N = 47)		Caucasian American comparison sample (N = 71)	
Scale	*M*	*SD*	*M*	*SD*
Validity Scales				
Cannot Say (CNS)	0.66	1.85	0	0
Combined Response Inconsistency (CRIN)	56.74	8.89	51.45	9.46
Variable Response Inconsistency (VRIN)	55.40	9.50	51.87	9.34
True Response Inconsistency (TRIN)	56.70	6.77	56.01	6.39
Infrequent Responses (F)	56.64	15.33	54.37	16.90
Infrequent Psychopathology Responses (Fp)	**60.23**	17.24	52.54	12.91
Infrequent Somatic Responses (Fs)	56.87	14.49	58.51	16.22
Symptom Validity Scale (FBS)	56.87	9.39	56.97	12.28
Response Bias Scale (RBS)	58.87	12.33	57.69	13.91
Uncommon Virtues (L)	**60.26**	10.31	48.24	6.75
Adjustment Validity (K)	50.83	8.59	46.58	9.20
Higher-Order (H-O) Scales [a]				
Emotional/Internalizing Dysfunction (EID)	52.32	8.59	54.21	11.19
Thought Dysfunction (THD)	**60.47**	11.08	52.32	10.48
Behavioral/Externalizing Dysfunction (BXD)	48.36	7.44	48.82	7.70

(cont.)

Table 5 (cont.)

	Saudi Arabian sample (N = 47)		Caucasian American comparison sample (N = 71)	
Scale	*M*	*SD*	*M*	*SD*
Restructured Clinical (RC) Scales [a]				
Demoralization (RCd)	51.47	8.56	54.13	10.86
Somatic Complaints (RC1)	56.51	10.16	58.42	12.98
Low Positive Emotions (RC2)	54.13	10.26	50.79	11.43
Antisocial Behavior (RC4)	45.81	6.60	46.77	8.82
Ideas of Persecution (RC6)	56.19	10.78	51.58	9.30
Dysfunctional Negative Emotions (RC7)	53.60	10.90	55.37	10.18
Aberrant Experiences (RC8)	**62.17**	11.40	55.65	12.56
Hypomanic Activation (RC9)	52.47	9.57	54.03	10.89
Specific Problems (SP) Scales				
Somatic Scales [a]				
Malaise (MLS)	45.15	8.78	47.92	10.29
Neurological Complaints (NUC)	56.23	12.36	56.56	12.27
Eating Concerns (EAT)	51.60	11.49	52.41	11.58
Cognitive Complaints (COG)	52.13	12.03	58.48	11.72
Internalizing Scales [a]				
Suicidal/Death Ideation (SUI)	46.55	7.31	52.44	14.47
Helplessness/Hopelessness (HLP)	49.49	11.37	49.08	11.79
Self-Doubt (SFD)	49.74	10.19	54.34	11.22
Inefficacy (NFC)	53.98	9.62	55.72	10.69
Stress (STR)	51.83	8.74	55.01	10.13
Worry (WRY)	51.81	9.37	53.93	11.10
Compulsivity (CMP)	58.21	9.59	58.63	11.76
Anxiety-Related Experiences (ARX)	54.17	10.48	56.15	11.39
Anger Proneness (ANP)	50.49	10.46	50.72	9.54
Behavior-Restricting Fears (BRF)	57.04	12.84	54.41	13.67
Externalizing Scales [a]				
Family Problems (FML)	49.04	10.58	50.96	11.94
Juvenile Conduct Problems (JCP)	48.89	6.86	46.37	6.84
Substance Abuse (SUB)	43.81	7.28	48.38	9.31
Impulsivity (IMP)	52.06	9.04	53.04	10.54
Activation (ACT)	54.13	10.81	53.86	9.28
Aggression (AGG)	54.79	10.82	52.18	10.37
Cynicism (CYN)	51.74	9.49	52.27	10.39

(cont.)

Table 5 (cont.)

	Saudi Arabian sample (*N* = 47)		Caucasian American comparison sample (*N* = 71)	
Scale	*M*	*SD*	*M*	*SD*
Interpersonal Scales [a]				
Self-Importance (SFI)	52.28	9.97	48.82	10.35
Dominance (DOM)	47.87	8.56	48.31	9.32
Disaffiliativeness (DSF)	55.13	10.08	49.89	9.49
Social Avoidance (SAV)	53.04	9.89	48.85	11.32
Shyness (SHY)	53.23	8.90	54.63	10.97
Personality Psychopathology Five (PSY-5) Scales [a]				
Aggressiveness (AGGR)	49.77	10.30	48.14	8.68
Psychoticism (PSYC)	**62.98**	12.39	53.61	11.01
Disconstraint (DISC)	45.64	6.95	48.68	7.56
Negative Emotionality/Neuroticism (NEGE)	53.70	9.43	56.00	11.12
Introversion/Low Positive Emotionality (INTR)	53.51	9.70	48.83	11.55

Note. [a] = Scales that are the focus of the analyses. Mean scores in bold are at least one standard deviation above the normative mean. Mean scores that are underlined are at least one-half standard deviation above the normative mean.

Of the Saudi Arabian sample's mean MMPI-3 scores, seven validity scales reached a mean T score of one-half standard deviation above the normative mean (55-59). Additionally, scale L and scale Fp reached a T score of at least one standard deviation above the mean (60-64). Six of the 42 substantive scales reached a T score between 55 and 59, or one-half standard deviation above the normative mean: RC1, RC6, NUC, CMP, BRF, and DSF. Three of the substantive scales reached a subclinical level at one standard deviation above the normative mean (T-score 60-64): THD, RC8, and PSYC. None of the substantive scales reached the clinical cutoff score of 65. Among the Caucasian comparison sample, four validity scales and 10 substantive scales reached a T score of one-half standard deviation above the normative mean. No scales exceeded a score of one standard deviation above the mean among the comparison sample. There were no low scores (T-score $\leq$ 40) in either sample.

Primary analyses of the study consisted of comparing MMPI-3 substantive scale scores between the Saudi Arabian and Caucasian American student samples, specifically the Higher-Order (H-O), Restructured Clinical (RC), Specific Problems (SP), and Personality Psychopathology Five (PSY-5) scales. Results from Box's test of equality of covariance matrices indicated that the observed covariance matrices of the dependent variables were not equal across groups, $F(903, 29619.7) = 1.19$, $p < .001$. Therefore, both Wilks' Lambda and Pillai's Trace, an alternative multivariate statistic, were examined after conducting a one-way MANOVA to determine the statistical significance of differences between groups. The MANOVA results were statistically significant, indicating a significant difference between the two samples on the substantive scales, Wilks' $\lambda = .319$, Pillai's Trace = .681, $F(42,75) = 3.813$, $p < .001$, partial $\eta^2 = .681$.

Prior to conducting a series of follow-up univariate analyses of variance (ANOVAs), the assumption of homogeneity of variance was tested for all 42 of the MMPI-3 substantive scales. Based on Levene's Test of Homogeneity of Variance, 38 of the substantive scales met the assumption of homogeneity of variance and were entered into a series of ANOVAs. Six of these substantive scales were found to be statistically significant between the two samples when applying a stringent .01 level of significance. Using a .05 level of significance, significant differences were found for an additional four substantive scales. Results of the ANOVAs are illustrated in Table 6.

(cont.)

Table 6

Significant ANOVA results for MMPI-3 scale scores of Saudi Arabian sample and Caucasian American comparison sample that met the assumption of equality of covariance matrices

Scale	Saudi Arabian sample (N = 47)		Caucasian American comparison sample (N = 71)		F (42,75)	p	η^2
	M	*SD*	*M*	*SD*			
THD	60.47	11.08	52.32	10.48	16.321	<.001	.123
RC6	56.19	10.78	51.58	9.30	6.125	.015	.050
RC8	62.17	11.40	55.65	12.56	8.200	.005	.066
COG	52.13	12.03	58.48	11.72	8.136	.005	.066
SFD	49.74	10.19	54.34	11.22	5.092	.026	.042
SUB	43.81	7.28	48.38	9.31	8.066	.005	.065
DSF	55.13	10.08	49.89	9.49	8.206	.005	.066
SAV	53.04	9.89	48.85	11.32	4.291	.041	.036
PSYC	62.98	12.39	53.61	11.01	18.548	<.001	.138
DISC	45.64	6.95	48.68	7.56	4.862	.029	.040

Note. Only scales that reached statistical significance ($p < .05$) are listed in this table.

The four substantive scales that violated the assumption of homogeneity of variance (RC1, SUI, STR, and INTR) were entered into a Mann-Whitney U Test, a nonparametric alternative pairwise comparison method, to determine if there were statistically significant differences between the two samples. Distributions of the four scale scores between the two groups were similar, as assessed by visual inspection. Scores for SUI were found to be significantly higher in the Caucasian sample, while INTR scores were found to be significantly higher in the Saudi Arabian sample. Results of the Mann-Whitney-U Test are illustrated in Table 7. A total of 12 out of 42 substantive scales analyzed by either ANOVAs or the Mann-Whitney U Test demonstrated a significant difference in scores between the two samples.

Table 7

Significant Mann-Whitney U Test results for MMPI-3 scale scores of Saudi Arabian sample and Caucasian American comparison sample

Scale	Saudi Arabian sample (N = 47)		Caucasian American comparison sample (N = 71)		*U*	*p*
	M	*SD*	*M*	*SD*		
SUI	46.55	7.31	52.44	14.47	1341	.016
INTR	53.51	9.70	48.83	11.55	2173	.005

Note. Only scales that reached statistical significance ($p < .05$) are listed in this table.

Means and standard deviations of the AIRS Acculturation and Perceived Prejudice subscales were derived for the Saudi Arabian sample. Acculturation scores on the AIRS can range from a minimum of 11 to a maximum of 61, with lower scores indicating higher levels of acculturation. The average score of this sample on the AIRS Acculturation subscale was 43.40 (*SD* = 6.70) with a median score of 44, range = 24 to 54. Perceived Prejudice subscale scores can range from a minimum of 20 to a maximum score of 120, with higher scores indicating higher levels of perceived prejudice. The average score on the Perceived Prejudice subscale was 63.47 (*SD* = 8.80) with a median score of 62, range = 41 to 82.

Pearson Product Moment Correlations revealed a moderate positive correlation between level of perceived prejudice and the F validity scale, with perceived prejudice explaining 16% of the variance in F scale scores. Correlations between level of perceived prejudice and MMPI-3 substantive scales were significant, with moderate effect sizes, for EID, RCd, SUI, FML, and INTR, as shown in Table 8.

Table 8

Pearson correlation results between perceived prejudice and MMPI-3 scales among the Saudi Arabian student sample

MMPI-3 Scales	Perceived Prejudice
CNS	-.30
CRIN	-.11
VRIN	-.01
TRIN	-.10
F	.40*
Fp	.05
Fs	.35
FBS	.23
RBS	.34
L	-.19
K	-.27
EID	.43*
THD	.28
BXD	.37
RCd	.39*
RC1	.17
RC2	.32
RC4	.33
RC6	.24
RC7	.36
RC8	.30
RC9	.18
MLS	.32
NUC	.01
EAT	.05
COG	.34
SUI	.42*
HLP	.30
SFD	.36
NFC	.17
STR	.15
WRY	.06
CMP	.13
ARX	.30

(cont.)

Table 8 (cont.)

MMPI-3 Scales	Perceived Prejudice
ANP	.19
BRF	-.24
FML	.41*
JCP	.23
SUB	.27
IMP	.24
ACT	.08
AGG	.37
CYN	.22
SFI	.12
DOM	.03
DSF	.27
SAV	.27
SHY	.12
AGGR	.22
PSYC	.27
DISC	.29
NEGE	.23
INTR	.39*

*$p < .01$).

To determine whether the effect between perceived prejudice and MMPI-3 scores was mediated by acculturation, mediation analysis was conducted through a series of simple linear regressions. As seen in Table 9, there was a significant total effect of perceived prejudice on 20 of the MMPI-3 scales in the initial step of the analysis. However, the indirect effect of perceived prejudice on these MMPI-3 scores via acculturation was not found to be statistically significant based on Sobel Tests, as shown in Table 10.

(cont.)

Table 9

Significant total effects of perceived prejudice on MMPI-3 scales

Scale	β	*p*
F	.404	.005
Fs	.353	.015
RBS	.339	.020
EID	.433	.002
SUI	.420	.003
FML	.405	.005
RCd	.387	.007
INTR	.385	.008
AGG	.370	.011
BXD	.368	.011
SFD	.363	.012
RC7	.361	.013
COG	.335	.021
RC4	.327	.025
RC2	.323	.027
MLS	.323	.027
ARX	.300	.041
RC8	.297	.042
HLP	.297	.043
DISC	.291	.047

Note. Only scales that reached statistical significance ($p < .05$) are listed in this table.

(cont.)

Table 10

Indirect effects between perceived prejudice and select MMPI-3 scales through acculturation

Scale	*z*	SE	*p*
F	1.159	.106	.246
Fs	1.064	.078	.287
RBS	1.013	.061	.311
EID	1.022	.041	.307
SUI	.963	.032	.336
FML	.961	.047	.337
RCd	1.080	.047	.280
INTR	-.612	.033	.540
AGG	-.669	.038	.503
BXD	.260	.023	.795
SFD	1.120	.063	.263
RC7	.963	.050	.336
COG	.198	.037	.843
RC4	.655	.023	.512
RC2	.526	.034	.599
MLS	.759	.033	.448
ARX	1.073	.059	.283
RC8	1.102	.069	.270
HLP	.442	.037	.659
DISC	.306	.022	.759

Chapter 6: Discussion

International students face periods of adjustment related to cultural factors not typically experienced by domestic students. Currently, Saudi Arabians constitute the largest proportion of Middle Eastern international students attending school in the United States (IIE, 2021). Middle Eastern culture has been vilified and negatively stereotyped in the United States over the past few decades, therefore placing Saudi Arabian students in a uniquely vulnerable position as targets of prejudice and discrimination. Perceived discrimination has been found to be related to lower levels of psychological well-being in adults (Schmitt et al., 2014) and positively correlated with psychological distress in Arab individuals specifically (Moradi & Hasan, 2004). This increases the likelihood that some of these students may seek out mental health services.

The MMPI and its revised editions have been successfully utilized in college counseling centers, where Saudi Arabian international students would likely present if they were to seek mental health services. Previous research has demonstrated that ethnic minorities tend to score higher on various scales of the MMPI and its revised editions, eliciting discussion as to whether this is reflective of cultural factors, stress of adaptation, or a combination of the two. This raises the question of whether the predominantly Caucasian U.S. normative sample used in the MMPI-3's development is the most accurate point of comparison for Middle Eastern students and points to the need for reference group data.

Little research has been published aimed at examining MMPI scores of a Middle Eastern college sample in the United States, and no studies could be found focused specifically at a Saudi Arabian student sample. The MMPI-3 is the test that will be

utilized by clinicians for the decades that follow, including those at college student counseling centers. Therefore, the current study aimed to develop reference group data for Saudi Arabian international students using the MMPI-3, as well as to investigate the contribution of cultural background on test scores. Having this reference group data and an understanding of how cultural factors, such as levels of acculturation and perceived prejudice, impact MMPI-3 scores will allow for a more accurate point of comparison when interpreting the MMPI-3 scores of Saudi Arabian international students.

An initial goal of the study consisted of examining the MMPI-3 scores of the Saudi Arabian and Caucasian student samples for the purpose of creating reference group data for Saudi Arabian students, as well as gathering an overall picture of score ranges and elevations prior to additional analyses being conducted. MMPI-3 scale scores generally fell within the average range for both samples and there were no clinically elevated scales. This is not surprising for college samples, as previous research has indicated that college student samples tend to score in the 50-60 T-score range and produce scores similar to the test's normative sample. Scores for a college comparison group were also released with the MMPI-3 (Ben-Porath & Tellegen, 2020b), with T-scores ranging from 46 (scale K) to 56 (scales RC7 and STR).

Although still not reaching the clinical cutoff, Saudi Arabian students did produce a greater number of scale scores one standard deviation above the normative mean compared to the Caucasian sample, including scales L, Fp, THD, RC8, and PSYC, suggesting that Saudi Arabian students tend to score slightly higher on various scales compared to the suggested college norms of the MMPI-3. The greatest discrepancy between the two samples was found on scale L, the mean score of which was 12 T-score

points higher for the Saudi Arabian sample. High scores on Scale L are typically associated with a positive self-presentation involving denial of minor faults and shortcomings, but may also reflect a traditional upbringing (Ben-Porath & Tellegen, 2020a). Bagby et al. (2020) reported similar elevations on scale L among a sample of Muslim undergraduate participants, explained by the traditional background hypothesis. As the Saudi Arabian sample in the current study belongs to a collectivist culture and was almost entirely Muslim, it is likely that these individuals would endorse more conventional attitudes and likely some traditional Muslim faith values such as obedience, conservatism, and privacy (Reilley & Knight, 1970). Thus, the relatively higher L scale mean for the Saudi Arabian student sample could reflect the influence of cultural and religious values as opposed to a positive impression management effort. Interestingly, the Caucasian sample obtained an overall higher number of substantive scale scores elevated over the normative mean. This could also be explained by the moderately elevated scale L scores among the Saudi Arabian sample, as it suggests some expressions of difficulty are inhibited in the service of maintaining a positive self-presentation.

The primary goal of the study was to determine whether there were significant differences in MMPI-3 scores between the two samples. Based on previous MMPI research suggesting that ethnic minorities tend to score higher across various scales than Caucasian Americans, it was hypothesized that the Saudi Arabian sample would obtain significantly higher scores on several MMPI-3 substantive scales. This hypothesis was partially supported. Significant differences were found for 10 substantive scales, with six of these scale scores being higher for the Saudi Arabian sample: THD, RC6, RC8, DSF, SAV, and PSYC. THD and PSYC were both found to be significantly higher for the

Saudi Arabian sample at a stringent .01 level of significance, while RC8 was found to be higher at a .05 level of significance. These three scales are designed to measure aberrations in perceptual and thinking processes. However, cultural factors suggest a different interpretation. As noted earlier, Middle Eastern culture has been described as collectivistic whereas American norms and values are predominantly based on an individualistic perspective, which research has shown can shape individuals' perceptions about themselves and the world around them (Triandis, 2001) The Saudi Arabian sample's relatively higher scores on these three scales therefore are likely reflective of cultural differences as opposed to unrealistic or disordered thinking, particularly as the scores were in the subclinical range. Saudi Arabian students also scored higher on RC6, a scale that typically reflects a degree of suspiciousness and mistrust, at a .05 level of significance. Considering these students go through a period of adjustment living in a country where the predominant race, religion, and cultural norms are different from their own, they may feel out of place and experience heightened sensitivity as they attempt to familiarize themselves to a new environment. The relatively higher scores on RC6 in this instance could reflect a level of alertness that facilitates adaptation. The Saudi Arabian sample also scored significantly higher on SAV, DSF, and INTR, which collectively reflect a certain extent of social avoidance and restricted interest in social interaction. The relatively higher SAV scores suggest that Saudi Arabian students are less likely to enjoy social events and are less inclined to form close relationships compared to their American counterparts, while their higher DSF scores indicate they are more likely to spend time alone. Given that these students are a minority among a predominantly Caucasian American population, it would not be unexpected for some to feel isolated or not

integrated. Keeping others at arm's length could therefore serve a protective purpose as these students attempt to navigate their social environment and discover where they feel comfortable fitting in. However, the relatively higher INTR scores found for the Saudi Arabian sample suggest that they are less socially engaged and have fewer positive emotional experiences than their American peers, meaning there may be fewer opportunities for these students to feel a sense of belonging. This was supported by the fact that a majority (64%) of the Saudi Arabian sample endorsed items on the AIRS measure indicating that they would experience negative emotions if they did not have friends or family from their own country around them and are rarely invited to social outings with American peers.

Contrary to what was hypothesized, mean scores on certain substantive scales were found to be significantly higher for the Caucasian sample. One of these scales was SUB, indicating that the Caucasian student sample endorsed more items reflecting substance use. The lower number of Saudi Arabian students endorsing items related to substance abuse is likely explained, at least in part, by religious background. All but one of the Saudi participants identified as Muslim. The Islamic religion explicitly forbids the use of drugs and alcohol, such that devout Muslims are unlikely to partake in heavy substance use. This study did not examine how closely the Saudi Arabian participants adhered to the values and expectations enforced by their religion. However, the fact that the sample chose to identify as Muslim indicates a certain degree of religious adherence, whereas 31% of the Caucasian sample indicated they were not religious. The Caucasian sample was also more inclined to express acting out or impulsive behavior, evident in significantly higher DISC scores, whereas this appeared to be more inhibited within the

Saudi sample. Abudabbeh (2005) acknowledged that Arab individuals tend to exhibit fewer externalizing behaviors due to cultural values of obedience and conservatism, which could explain this finding. Interestingly, Caucasian American students also obtained higher scores on COG, SFD, and SUI, reflecting higher levels of cognitive difficulties, self-doubt, and suicidality.

Another goal of the study was to determine if MMPI-3 scale scores were significantly correlated with perceived prejudice for the Saudi Arabian sample. As hypothesized, positive correlations with moderate effect sizes were found between perceived prejudice and several scales reflecting negative emotional experiences, including EID, SUI, and RCd. This finding reflects the moderately strong relationship between perceived prejudice and internalizing feelings of sadness, dissatisfaction, pessimism, and suicidality. Previous research indicates that higher levels of perceived prejudice may contribute to lower levels of perceived personal control and reduced belief about one's capacity to influence their surroundings (Moradi & Hasan, 2004). Saudi students experiencing prejudice may therefore experience a sense of powerlessness, frustration, and hopelessness as they are unable to take action to change what is considered unfair treatment. This was further supported by the sizable portion of Saudi students in this study (70%) endorsing items on the AIRS measure indicating that they expect to be viewed as an outsider in America and believe that Americans view them as coming from a country with strange customs. Saudi students experiencing prejudice may therefore feel resigned to being viewed as a "foreigner" and experience negative emotions if they lack adequate social support. Relatedly, scores on INTR were positively and moderately correlated with perceived prejudice, reflecting a degree of social

introversion and lack of interest that would be expected from the perception that others are engaging in unfair or prejudiced acts. Interestingly, a significant correlation, with a moderate effect size, was also found between perceived prejudice and FML, an externalizing scale reflecting a sense of lacking family support; whether this is a byproduct of geographical distance from their families of origin or the effects of attempted and/or progressive adaptation to the American culture would require further investigation. Regression analyses showed perceived prejudice had a significant total effect on validity scale F, which measures overall psychological difficulty. Manifestations of psychological difficulty among those experiencing perceived prejudice may be expressed through internalization, as significant total effects of perceived prejudice were found particularly for scores on scales EID and SUI. This indicates that perceived prejudice is predictive of behaviors such as demoralization, pessimism, helplessness, and suicidal ideation.

A final goal of the study was to determine if the relationship between perceived prejudice and MMPI-3 scores was mediated by acculturation level. The findings did not support a mediating effect of acculturation. With regards to level of acculturation, the median acculturation score for the Saudi Arabian sample was slightly higher than the midpoint of score ranges for the AIRS acculturation scale, with higher scores on the scale reflecting lower acculturation levels. A closer examination of score frequencies revealed that 40 Saudi students in the sample produced an acculturation score in the higher range of possible scores (i.e., 37 to 54), while only six students scored below the mid-point. This indicates that students in this sample tended to be less acculturated. A majority of students in the Saudi Arabian sample had lived in the United States for three to four

years. Research suggests that individuals go through a process of either adapting or conforming to a majority culture after their initial arrival (Dow, 2010), with an ideal outcome being one of integration, described by Berry (2001) as the ability to live cohesively in a new environment while retaining one's cultural identity. Given the Saudi Arabian sample's relatively lower acculturation levels and the significant differences in their MMPI-3 scores in comparison to the Caucasian American sample, a period of three to four years could be insufficient enough time for students to have gone through successful integration. These students may still be gaining familiarity with their surroundings and learning how to adapt to a new environment. Overall, the results of the mediation analysis suggest a direct effect of perceived prejudice on MMPI-3 scores not mediated by acculturation level.

This study is the first of its kind to focus specifically on MMPI-3 scores of a Saudi Arabian student sample, making the reference group data generated by this study the first to be proposed for this population. While these scores are not meant to replace the published normative data released for the MMPI-3, they can be used concurrently with the standard norms for two primary purposes. The first purpose is to compensate for the risk of over-pathologizing Saudi Arabian students, as slightly elevated scores on certain scales could reflect cultural differences as opposed to disordered or maladaptive personality traits. The second purpose is to avoid the tendency to overestimate cultural impact, which could be detrimental if an individual's elevated scores reflect true psychological difficulty. In the MMPI-2 and MMPI-2-RF, test score profiles generated from computerized scoring superimpose comparison group means onto an examinee's profile summary. In a similar manner, the reference group means for the Saudi Arabian

student sample could be superimposed onto a Saudi student's standard MMPI-3 profile, allowing for greater interpretive accuracy. Additional contributions of this study include expanding upon current cross-cultural literature and adding to the growing body of research on the newly released MMPI-3. The findings of this study point to significant differences in scores between Saudi Arabian and domestic Caucasian students in particular areas assessed by the MMPI-3, supporting the importance of cross-cultural MMPI-3 research.

An additional contribution of this study is that it identified possible areas to assess further among Saudi Arabian students experiencing a sense of discrimination and prejudice in the United States. This is especially useful for clinicians working at student counseling centers, as this is where students are likely to present if seeking out mental health services. Given that perceived prejudice was found to be positively correlated with scales reflecting negative emotionality, internalization, suicidality, family conflict, and social introversion, student counseling centers might consider assessing levels of perceived prejudice among students and can equip themselves to target these areas of difficulty among students reporting higher levels of perceived prejudice.

There are limitations to this study that must also be considered. Although there were a sufficient number of participants in the primary and comparison samples to conduct statistical analyses, the statistical power and generalizability of the results are limited by the small sample sizes, particularly of the Saudi Arabian sample. There were additional limitations within the Saudi Arabian sample that further limits generalizability, including demographic makeup. The Saudi Arabian sample was predominantly composed of men. Therefore, the degree to which the proposed reference group data is generalizable

to Saudi Arabian female students could not be established. This is notable because gender differences among ethnic minority college students have been observed on various scales across the different editions of the MMPI (Gonzalez et al., 2019; Sue & Sue, 1974). Differences in the manifestations of mental disorders has also been found for Middle Eastern individuals (Shkalim, 2015), making it necessary to establish additional reference group data for Saudi Arabian women to ensure accurate interpretation of their MMPI-3 scores. The results could also have been impacted by the fact that the Saudi sample was on average older than the Caucasian sample and farther along in their academic career, potentially reflecting some differences in maturity.

The setting from which Saudi Arabian participants were recruited also limits the generalizability of the results. Both samples were comprised of students attending a university in a suburban area of Florida. According to the 2021 census, the city in which the university is located contains just over 85,000 people and 79% of these individuals identify as “White” (U.S. Census Bureau, 2021). Levels of perceived discrimination might have been impacted by these regional qualities and it is possible that scores may vary based on a region’s size and population. For example, Saudi Students may feel less out of place in larger cosmopolitan areas with more ethnically diverse populations, whereas they may be less comfortable in smaller rural areas or those with predominantly white, Christian populations.

Given the aforementioned limitations, replication of this study utilizing a larger nationwide sample could support the reliability of results reported in this study and extend its generalizability, particularly for female Saudi Arabian college students. Future studies might consider examining scores of students who are younger and have been in

the U.S. for varying durations of time, as both of these factors may have influenced the perceived prejudice and acculturation scores of this sample. As the Saudi Arabian student sample of the present study did not produce a wide enough range of acculturation and perceived prejudice scores to subdivide the sample into high and low groups, replication of this research might examine differences in MMPI-3 scores between students reporting high versus low scores on either measure.

The findings of the present study suggest inhibited externalizing behaviors in Saudi Arabian students, which could be impacted by their degree of adherence to traditional Muslim values. However, this study did not assess religious adherence or the degree to which the students valued the beliefs of their religion. Future research could therefore introduce additional measures of religious adherence and extent of traditional values to determine if this study's findings are generalizable to Saudi Arabian students who do not identify as adhering strongly to the Muslim faith.

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Appendix A: Participant Informed Consent Form (Saudi Arabian Student Version)

Purpose of the study:
This study is being conducted by Emily Leonard, M.S., a clinical psychology doctoral student at Florida Institute of Technology, under the supervision of Dr. Radhika Krishnamurthy. The central purpose of the study is to examine the differences in scores between Saudi Arabian and domestic American college students. This will promote more culturally sensitive use of this test with Saudi Arabian students in the United States.

What will be done:
You will be asked to complete the Minnesota Multiphasic Personality Inventory- 3 (MMPI-3) and the American-International Relations Scale (AIRS). These are both self-report questionnaires. Additionally, you will be asked to provide some basic information about yourself (age, sex, major, etc.). These tasks will take approximately one and a half hours to complete.

Benefits of participation:
Participants will be contributing to research that will facilitate the assessment of personality and adjustment among an ethnic minority group.

Risks or discomfort:
There are no risks or discomforts expected as a result of participating in this study. Participation is entirely voluntary, and you have the right to withdraw your participation from the study at any time. If you experience any discomfort as a result of participation in this study and would like to receive psychological services, you may contact Counseling and Psychological Services (CAPS) at FIT at 321-674-8050.

Confidentiality:
You will not be identified by name in any of the research documents. This signed consent form will be stored and locked in a separate location from the results you provide to further ensure confidentiality.

How the results will be used:
The results of the study will be used for scholarly research purposes only. Scale scores and any identifying information will not be released to you or any third party. The research findings may be presented at a local and/or national conference or in a professional psychology journal.

Contact information:
Should you have any questions or concerns about this study, please contact Emily Leonard at eleonard2015@my.fit.edu, or the research advisor for the study Dr. Radhika Krishnamurthy at rkrishna@fit.edu. The Florida Institute of Technology Institutional Review Board's chair, Dr. Jignya Patel, may be contacted at FIT_IRB@fit.edu for verification of the study's approval.

By signing below:

1. You are affirming that you are 18+ years of age.
2. You acknowledge that you have read the information provided and agree to voluntary participation in this research.

Participant's Name: _____ Date: _____

Participant's Signature: _____ Date: _____

Appendix B: Participant Informed Consent Form (American Student Version)

Purpose of the study:
This study is being conducted by Emily Leonard, M.S., a clinical psychology doctoral student at Florida Institute of Technology, under the supervision of Dr. Radhika Krishnamurthy. The central purpose of the study is to examine the differences in scores between Saudi Arabian and domestic American college students. This will promote more culturally sensitive use of this test with Saudi Arabian students in the United States.

What will be done:
You will be asked to complete the Minnesota Multiphasic Personality Inventory- 3 (MMPI-3), a self-report questionnaire. Additionally, you will be asked to provide some basic information about yourself (age, sex, major, etc.). These tasks will take approximately one hour to complete.

Benefits of participation:
Participants will be contributing to research that will facilitate the assessment of personality and adjustment among an ethnic minority group.

Risks or discomfort:
There are no risks or discomforts expected as a result of participating in this study. Participation is entirely voluntary, and you have the right to withdraw your participation from the study at any time. If you experience any discomfort as a result of participation in this study and would like to receive psychological services, you may contact Counseling and Psychological Services (CAPS) at FIT at 321-674-8050.

Confidentiality:
You will not be identified by name in any of the research documents. This signed consent form will be stored and locked in a separate location from the results you provide to further ensure confidentiality.

How the results will be used:
The results of the study will be used for scholarly research purposes only. Scale scores and any identifying information will not be released to you or any third party. The research findings may be presented at a local and/or national conference or in a professional psychology journal.

Contact information:
Should you have any questions or concerns about this study, please contact Emily Leonard at eleonard2015@my.fit.edu, or the research advisor for the study Dr. Radhika Krishnamurthy at rkrishna@fit.edu. The Florida Institute of Technology Institutional Review Board's chair, Dr. Jignya Patel, may be contacted at FIT_IRB@fit.edu for verification of the study's approval.

By signing below:

1. You are affirming that you are 18+ years of age.
2. You acknowledge that you have read the information provided and agree to voluntary participation in this research.

Participant's Name: _____ Date: _____

Participant's Signature: _____ Date: _____

Appendix C: Student Demographic Questionnaire (Saudi Arabian Student Version)

Participant #:

Age:

Gender:

Country of origin:

Religion:

Length of time living in the US:

Primary language spoken:

Residency Status (i.e., F-1 student visa, work visa, citizenship):

Year in school:

Major:

Level of adjustment to college: 0 1 2 3 4 5
(0= not well; 3= moderately well; 5= very well)

General level of stress: 0 1 2 3 4 5
(0= not well; 3= moderately well; 5= very well)

Any prior or current mental health diagnoses (Yes/No):

Are you currently receiving counseling services (Yes/No):

Appendix D: Student Demographic Questionnaire (American Student Version)

Participant #:

Age:

Gender:

Ethnicity:

Religion:

Primary language spoken:

Year in school:

Major:

Level of adjustment to college: 0 1 2 3 4 5
(0= not well; 3= moderately well; 5= very well)

General level of stress: 0 1 2 3 4 5
(0= not well; 3= moderately well; 5= very well)

Any prior or current mental health diagnoses (Yes/No):

Are you currently receiving counseling services (Yes/No):