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Socioecological Determinants of Psychoticism Among Central-Asian Immigrants to the United States

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Abstract

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MA, Empire State College, 2016

Dissertation Submitted in Partial Fulfillment

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Abstract

Every year, thousands of individuals from every country and every walk of life arrive in the United States in hopes of better lives for themselves and their families. A significant portion of immigrants arrives from Central Asia countries, namely Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Stress associated with the process of uprooting in the country of origin and adaptation in the country of destination often makes newcomers vulnerable to developing mental health illnesses. The purpose of this work was to analyze relationships between psychoticism, psychological comorbidities, and psychosocial factors. This study used archival data that included 195 cases of individuals who immigrated from Central Asian countries to the United States. Statistical analysis included multiple linear regression, hierarchical multiple regression, and analysis of mediation. The analyses used psychoticism as the dependent variable, whereas interpersonal sensitivity, obsessive-compulsiveness, and hostility were independent variables of the group of psychological comorbidities. Psychosocial variables included age of immigration, gender of participants, and English language proficiency. The study found that the independent variables interpersonal sensitivity, obsessive-compulsiveness, hostility, gender, and English language proficiency were statistically significant predictors of psychoticism. The secondary analysis identified a full mediating effect of the independent variable obsessive compulsiveness on another independent variable, interpersonal sensitivity. The findings contribute to positive social change and to the field of mental health and public policies, informing stakeholders about risk and protecting factors of serious, persistent mental illness among immigrants from Central Asia.

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Dedication

This work is dedicated to millions of brave individuals who every year immigrate to other countries in pursuit of better lives for their families. I am one of them.

I would also like to dedicate this dissertation to my family: my mom, who taught me to be an honest, kind, and hard-working person. We started this journey together, but I am finishing it by myself. I hope you see it from Heaven and proud of your only son.

This work would not be possible without unconditional love and support from my wife, Susanne, who picked up the slack around the house, raising our children, and doing myriads other things while I was at my desk. Also, this work is dedicated to my friends and colleagues for the encouragement and believing in me.

Coelum non animum mutant qui trans mare currunt

Those who cross the sea, change the sky, not the soul

—Quintus Horatius Flaccus

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I would like to express my gratitude and endless respect to the dissertation committee chair, Dr. Barnes-Young, who selflessly guided me through the challenges of preparing this work. Many thanks to Dr. Charette for serving as a member of the dissertation committee and advising me during the process of writing this work. Also, I would like to thank Dr. Lionetti for always being in my corner during all these years and Dr. Allwright for giving me an opportunity to learn to love statistics. Thank you all. This work would not be possible without you.

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Chapter 1: Introduction to the Study

The purpose of this study was to investigate the role of psychosocial factors in the development and exacerbation of psychoticism among individuals who immigrated to the United States from Central Asia countries. Several critical points as well as a gap in the literature necessitate this research. First, immigration is one of the essential influencers of the demographic landscape, with others being natural factors such as death and birth (Virupaksha et al., 2014). Second, the exploration of the mental health status of immigrants is critical to the optimal provision of mental health services because individuals relocating from their countries of origin are often carrying the burdens of traumatic experiences and stressful events. In addition to that, language barriers can be a significant inhibitor of seeking appropriate mental health assistance (Derr, 2017). It is not uncommon for immigrants to experience societal stigmatization against mental disorders in their countries of origin, which can be yet another factor detrimental to their psychological well-being. Such conditions often have compounding effects leading to longer durations of untreated serious, persistent mental illnesses (SPMI; Ponte, 2019).

This work addressed psychoticism as both a potential precursor and predictor of psychosis spectrum disorders among immigrants from Central Asia. Disorders such as schizophrenia are life-long debilitating mental conditions that account for enormous expenditures of the healthcare budgets and loss of productivity. Chong et al. (2016) estimated that annual direct costs to the healthcare budget and indirect labor market losses associated with schizophrenia approximated US $ 60 billion in the United States alone.

Individuals prone to mental health illnesses are at higher risk for unlawful conduct such as drug-seeking behaviors, violent crimes, robberies, burglaries, and others (McGinty et al., 2018). Destabilizing mental conditions could also be contributing factors in seeking social acceptance associated with gang involvement or pursuing affiliations with terrorist organizations (Ho et al., 2019). Gill and Corner (2017) noted that an analysis of recent terrorist attacks in the United States and Europe conducted or influenced by the Islamic State revealed that 27.6 % of individuals involved in these acts had significant psychological problems.

Positive Social Change

This study provided an analysis of precipitating factors that had been shown to exacerbate SPMIs. Some of these factors (e.g., family ties and the level of education) might inhibit or protect against risks of decompensation, whereas others increase the probability of or encourage psychological instability. Determining the significance and differences between these factors through the accurate identification of them should inform clinicians about individuals with a higher predisposition to develop such disorders. It may also prevent such undesirable outcomes via formulating appropriate and timely evidence-based interventions. Another possible positive change that this study could be credited with is the improved safety of our communities. The findings of this study will not be confined to clinical work exclusively. Other fields such as law enforcement could benefit from familiarizing its members to recognize the factors contributing to serious mental disorders. The relief of societal economic burdens associated with the reduction of healthcare costs is another possible positive social

change as tax-payer money could be redistributed elsewhere (e.g., afterschool programs for children of immigrants, antibullying interventions, or English proficiency classes for the elderly) to achieve a better overall return on investment on a per dollar spent basis.

In this chapter, a background for this study is provided, including a brief review of current literature and elaborating on the gap in knowledge regarding associations between immigration and mental health illnesses. This chapter offers a description of a problem that stems from the gap in knowledge about mental health problems in this particular population. Later in this chapter, the purpose of the study will be substantiated, thus delineating the nature of this study and providing descriptions of variables. The chapter will also contain hypotheses and research questions, definitions of terms, and limitations of the study. The chapter will address the significance of the study and conclude with a brief summary.

Background of the Study

The scientific notion of SPMIs as existing on a continuum between normalcy and pathology is not novel. Past literature has established a solid theoretical foundation of that idea. Strauss (1969) described various hallucinatory and delusional experiences among patients diagnosed with schizophrenia, describing these experiences as continua of different severities and frequencies. Carpenter et al. (1974) expanded the concept of psychiatric continua to the taxonomy of other SPMI by introducing a concept of psychopathologic categories.

More recent publications further developed the paradigm. DeRosse and Karlsgodt (2015) noted that the psychosis as continuum versus psychosis as category had been a

subject of debate among professionals in the mental health field and proceeded in several different directions of investigation. David (2010) investigated the variability and severity of symptoms not only within groups of patients but also between groups of patients. The idea is closely correlated to this study, illustrating the concept of the psychotic continuum: subclinical manifestations of psychosis might intensify enough to become full clinician presentations. Raihani and Bell (2019) investigated paranoid symptoms, one of the essential components of SPMI, and suggested that such traits could not be evaluated solely as a sign of pathology but rather as part of the typical operation of a human organism, which could eventually transition into the clinical realm.

A number of internal (e.g., neurobiological) and external (e.g., familial) factors determine the position of the individual's presentation on the continuum between normalcy and pathology. Stressful life events are significant factors that influence the mental states of human beings in general and immigrants in particular. Sternberg et al. (2016) stated that immigrants were more vulnerable to stress due to adaptation challenges. The connection between psychotic presentations and stressful life events, including immigration is discussed below.

Stressful Life Events and Psychotic Continuum

Stress is a ubiquitous human experience that can be categorized by the following parameters: (a) duration (short or chronic), (b) quality (eustress or distress), and (c) effect on a person (positive or negative), according to Wallace (2020). The association between stressful life events and mental health has long been the subject of attention from the academic community and practitioners.

March-Llanes et al. (2017) identified stressful life events as causative factors for developing or exacerbating existing disorders of psychotic spectra. However, the effects of stressful life events are not always demonstrable directly in psychotic presentations, per se. Disorders such as depression, anxiety, and posttraumatic stress disorder (PTSD) could be implicated in the development of other psychological comorbidities that subsequently increase the probability of the emergence of disorders along the psychosis spectrum. This is one of the focal points of this study: to investigate correlations between mental health comorbidities and psychosis.

The relationship between stressful life events and various psychological disorders is indeed well established. An array of researchers has reported adverse life events as causative factors in developing new and worsening of existing symptoms in depressive disorders (e.g., Fang et al., 2020; Guille et al., 2014; Maciejewski & Mazure, 2000; Serafini et al., 2020). Strong positive associations were established between stressful life events and anxiety. Francis et al. (2012) reported an increased cumulative probability of exacerbation of anxiety symptoms correlated with an increase in stressful life events. Likewise, Sheerin et al. (2018) compared and contrasted similarities and differences in developing anxiety and depressive disorders associated with stressful life events.

Stressful life events are also associated with the use of alcohol and substances, which is often a significant factor in developing or worsening psychotic manifestations. Lijffijt et al. (2014) stated that chronic stress was associated with an increased risk for substance use disorders, thus, increasing the proclivity to exacerbate psychotic manifestations as well. Wemm and Sinha (2019) further differentiated individual

differences such as gender, adverse life events, and drug history as predictors of substance disorders. This research has demonstrated that exposure to adversity and stressful life events and adversity is a contributor to either the initial development of psychological disorders or intensification of existing symptoms. In particular, immigration is one of the life-changing experiences that is stressful enough to cause or contribute to psychological disequilibrium (Shekunov, 2016).

Immigration-Related Stress

Immigration is a process through which individuals seek permanent residence or citizenship in another country. Immigration is international migration that often involves severing ties with countries of origin, the uncertainty of traveling, and challenges of settling in new countries, often with foreign cultures. The above challenges often pose significant stress to immigrants and, as a consequence, might lead to the development or exacerbation of mental illnesses. Yakhnich (2008) stated that international relocation and assimilation to the customs of a new community were stressful events. The author emphasized that immigration was a lengthy process that imposed chronic and long-term stress, which was likely to increase risks of mental health issues such as anxiety, depression, and psychosomatic complaints, among others.

Shekunov (2016) identified three stages of immigration: (a) pre-migration, (b) physical relocation to another country, and (c) post-immigration as assimilation into a new society. The pre-migration stage is often associated with conditions pushing people to immigrate. Such conditions include political persecution, poverty, lack of civil freedom, restrictions in religious preferences, physical torture, sexual assaults, witnessing

the murder of family members or friends, and other factors often leading to the emergence of posttraumatic symptoms. Shekunov stated that the second stage of psychical relocation often exposed immigrants to difficulties of international travels, refugee camps, discrimination, and violence. The final stage of migration may bring a mix of competing emotions, namely, eustress of new opportunities and hope on one side, and distress related to challenges of assimilation on the other. Such challenges include isolation from formerly available social ties, difficulties in resuming education, a decrease in social status, language difficulties, lack of adequate employment, housing, and so on. Bourque et al. (2011) reported findings strongly suggesting that post immigration stress factors were more significant than pre-migration factors in conferring an increase in psychotic disorders among immigrants.

Shekunov (2016) suggested a two to three times increase in the prevalence of psychotic spectrum disorders among immigrants in comparison to the general population of the host country. Immigration-associated stress is a key factor in the course of psychiatric illnesses among immigrants; however, there is a significant gap in knowledge regarding this population.

This study utilized six independent variables associated with stress to analyze relationships between psychological factors, psychosocial factors, and psychoticism: interpersonal sensitivity, hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency. One of the variables is an interpersonal sensitivity, which is an affective response to stressful environmental conditions immigrants face, such as societal stigmatization (Morey, 2018). Another variable related to stress is

obsessive-compulsive behavior. Such behaviors are often adopted as a coping mechanism of rigid patterns providing individuals with a sense of security and safety of repetitive acts (National Institute of Mental Health, n.d.). A more detailed description of variables will be provided later in this chapter.

Knowledge Gap

The mental condition of the immigrant population is under-researched, although that population is associated with the over-representation of mental disorders (Bourque et al., 2011; Cantor-Graae et al., 2005; and others). There is also more than sufficient knowledge available on various difficulties that challenge immigrants and the role of stress in developing psychotic symptoms. However, there is a significant knowledge gap regarding the development of psychotic illnesses among immigrants (*inter alia,* Alegria et al., 2017; Kirmayer et al., 2011; Rousseau & Frounfelker, 2019). Moreover, there is insufficient research on the target population: individuals who relocate to the United States from countries of Central Asia. In addition, there is a scarcity of knowledge regarding interactions between psychological comorbidities and individual characteristics in light of developing psychotic symptoms (Eisenbarth et al., 2019). Also, there is insufficient knowledge about the level of stress that immigrants endure during re-settlement periods (Alegria et al., 2017; Sirin et al., 2019). There is also a gap in knowledge about risk factors contributing to the development of psychological disorders, especially among immigrants (Kirmayer et al., 2011; Rousseau & Frounfelker, 2019). The main aim of this study was to explore the gap in knowledge regarding interactions

between psychological disorders, demographic data, and symptoms of psychoticism among immigrants from Central Asia.

Problem Statement

Every year, thousands of individuals from Central Asia enter the United States (Homeland Security, 2020), and their mental health challenges are neither successfully identified nor appropriately addressed (Rousseau & Frounfelker, 2019). In this work, I investigated statistically significant correlations between psychological comorbidities and psychosocial variables in order to contribute to developing strategies to improve provisions of mental health services to this population. According to the Pew Research Center (2020), beginning in 2018, immigrants from Asia became the largest group of foreign settlers, accounting for 38% of all newcomers.

The Central Asian Bureau for Analytical Reporting (2019) stated that during the period from 1999 to 2017, over 10,000 individuals from Kyrgyzstan became permanent residents in the United States. In the same period, approximately 50,000 Kyrgyz citizens were admitted to the United States on nonimmigrant visas. According to the U.S. Embassy and Consulate in Kazakhstan (2021), approximately 26,000 Kazakhstani live in the United States. Another 18,000 Kazakhstan citizens received various nonimmigrant visas to the United States only in the last year. Immigration tendencies from other Central Asian countries are similar: some individuals receive immigrant visas; others attempt to change their nonimmigrant status while in the United States. The U.S. Census Bureau (2016) estimated the number of individuals from Uzbekistan living in the United States to be more than 62,000. According to the World Atlas (2021), the Tajik population in the

United States was estimated at 52,000. There is no reliable information about the Turkmen population in the United States; however, Green Card lottery winners in Turkmenistan account for 772 individuals for the period from 2016 to 2018 (U.S. Department of Homeland Security, 2020) and nonimmigrant visas were issued to 4,721 individuals in the years 2017 to 2019 (U.S. Department of Homeland Security, 2020). According to the Office of Immigration Statistics (2018), 84,989 individuals were admitted to the United States as refugees during 2016. During the same year, 20,445 individuals were granted asylum, which constitutes 24% of applicants. Therefore, utilizing this tendency, for this study, I assumed that the number of permanent residents from Central Asian countries would have increased due to approvals of asylum petitions. Considering the above, the number of individuals from the countries of Central Asia who immigrated to the United States or adjusted status while in the United States could range from 150,000 to 170,000.

The significance of this study was stipulated by the prevalence of psychological disorders among immigrants and the number of immigrants living in the United States. Alegria et al. (2017) stated that immigration remained one of the critical factors of the population growth in the United States, with 42 million foreign-born individuals currently living in the country. As it is established above, immigration is a stressful life event contributing to the emergence or exacerbation of various health issues, including mental health. Kirmayer et al. (2011) stated that the immigrant populations demonstrated an elevated prevalence of psychotic illnesses associated with stressful conditions of various phases of immigration.

In this study, I built upon existing research findings that explored the psychological challenges of immigrants. Virupaksha et al. (2014) addressed the mental health challenges of internal migrants in Southern Asia. Alegria et al. (2017) provided an analysis of risk and protective factors pertaining to immigration as a general process. The study of Kaltenbach et al. (2018) addressed the development of psychiatric symptoms among immigrants entering Germany. Giacco (2019) provided a review of the literature on critical points of the mental health of immigrants. The above studies, however, did not focus on the U.S. immigrant population originating in the countries of Central Asia. While Kashyap et al. (2019) conducted a study with a primary focus on risk factors of PTSD among individuals entering the United States, they did not explore psychotic spectrum disorders. Ismayilova et al. (2014) investigated the mental health of Central Asian migrants but only among individuals relocating to the Russian Federation, not the United States, and the culture of the host country is one of the essential factors of assimilation (Rumbaut, 2015).

It is apparent from the above that a significant gap existed in the current literature regarding U.S. immigrants originating in the countries of Central Asia. This work aimed to address the gap in the research literature regarding this population via an analysis of the relationships between psychoticism, psychological comorbidities, and psychosocial variables.

Purpose

The purpose of this quantitative study was to analyze the relationship between symptoms of psychoticism, psychological comorbidities, and demographic data of

immigrants from Central Asia to the United States. In this work, I used the method of hierarchical multiple regression (HMR), where the parameter of psychoticism served as the dependent variable, with an aggregate psychiatric assessment and the summary of demographic measures as independent variables. In the following section, I will elaborate on the psychological comorbidities derived from the aggregate psychiatric assessment and demographic data derived from patients' interviews. The choice of variables was determined by the purpose of the study, the design of the study, and the existing literature. Current literature demonstrated significant correlations between demographic factors and mental health (Anderson et al., 2018; Kim & Kim, 2017).

Research Questions and Hypotheses

This study utilized a number of variables that were categorized here as an aggregate psychiatric assessment and psychosocial factors. Consistent with Unterrassner et al. (2017), the aggregate psychiatric assessment included scores of interpersonal sensitivity, hostility, psychoticism, and obsessive compulsiveness as derived from the Symptom Assessement-45 (SA-45; Strategic Advantage, 1996). Psychosocial characteristics included age of immigration, gender, and English language proficiency.

RQ_1: To what extent does interpersonal sensitivity predict psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant?

H_{01}: Interpersonal sensitivity is not a statistically significant predictor of psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A1}: Interpersonal sensitivity is a statistically significant predictor of psychoticism when hostility, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

RQ_2: To what extent does hostility predict psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant?

H_{02}: Hostility is not a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A2}: Hostility is a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

RQ_3: To what extend does obsessive-compulsiveness predict psychoticism when interpersonal sensitivity, hostility, gender, age of immigration, and English language proficiency are held constant?

H_{03}: Obsessive-compulsiveness is not a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

H_{A3}: Obsessive-compulsiveness is a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

RQ_4: To what extent does gender predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant?

H_{04}: Gender is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant.

H_{A4}: Gender is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant.

RQ_5: To what extent does age of immigration predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, mental health history, and English language proficiency are held constant?

H_{05}: Age of immigration is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and English language proficiency are held constant.

H_{A5}: Age of immigration is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and English language proficiency are held constant.

RQ_6: To what extent does English language proficiency predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant?

H_{06}: English language proficiency is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant.

H_{A6}: English language proficiency is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant.

Variables

Psychoticism, as the dependent variable, was measured on a continuous level because the score was calculated as a sum of five subcategories measured on the Likert-type scales and derived from SA-45 (Strategic Advantage, 1996). Psychiatric assessment scores for hostility, interpersonal sensitivity, and obsessive-compulsiveness were independent variables. Similar to the dependent variable, these variables were measured on the continuous level and comprised of sums of Likert-type scores derived from the SA-45 (Strategic Advantage, 1996).

Psychosocial factors comprised another group of independent variables. The levels of their measurement were more diverse because this group of variables included a continuous variable (age of immigration) and two binary categorical variables (gender and English language proficiency).

Theoretical Framework for the Study

This study on psychoticism, psychological comorbidities, and psychosocial factors among immigrants to the United States from Central Asia was based on several theories that provide a solid foundation for formulating research questions, providing

propositions for developing hypotheses, and conducting subsequent statistical analyses. The text below elaborates on the following theoretical constructs: (a) the theory of psychotic continuum, (b) the theory of acculturative stress, and (c) stress-vulnerability theory.

Psychotic Continuum

Scientific inquiry on psychosis began in the 19th century when Kraepelin coined the term *dementia praecox* and ascribed psychotic symptoms to the disorder (Kraepelin, 1920). Opposing this approach, another influential psychiatrist Blueler, adopted the continual model of the disorder and renamed it *schizophrenia* (Blueler & Brill, 1924). This theoretical platform presumed continuity between the pathology of psychosis and normalcy (DeLisi, 2008). In the middle of the 20th century, Meehl (1962) delineated the continuum of symptomatic aberrations from a milder schizotaxia to a more severe schizophrenia.

The theory of the psychotic continuum underwent further development, morphing into a proneness-persistence-impairment model (van Os et al., 2009). This model posits that transitory symptoms of psychosis (proneness phase) may become abnormally permanent (persistence phase) and present clinically relevant pathologies (impairment phase). According to this theoretical framework, subclinical manifestations might become clinical presentations under certain conditions (Debbane et al., 2016). Debbane et al. (2016) stated that premorbid state of psychosis characterized by subtle subclinical conditions conferred a distal risk for developing full-blown psychoses under internal (physiological) and external (environmental) factors. The idea contributed to the

theoretical foundation of this study about psychological and psychosocial factors influencing symptoms of psychoticism.

Acculturative Stress

Individuals who relocate from other countries almost inevitably experience a variety of challenges, including acculturative stress. Dillon et al. (2013) defined acculturative stress as a psychological challenge that immigrants face in response to cultural differences in a new county. The theory of acculturative stress was developed by Berry in the early 1970s based on the Stonequist theory of marginal man (Johnson, 1976). The marginal man theory posited a psychological challenge of (a) living in a multicultural milieu, (b) necessity to identify with one or another culture, and (c) ascribing hierarchical values to these cultures. Stonequist (1937) stated that marginal individuals often felt inferior coming into contact with the culture of higher prestige and power.

The theory of acculturative stress is based on the multidimensionality of the internal re-evaluation and adaptation resulting from contact with the host culture. Berry et al. (1988) extended the theory of acculturative stress by identifying several variations of acculturation, such as assimilation, marginalization, separation, and integration. Adoption of different strategies leads to different coping mechanism and stressors in the lives of immigrants. Pawliuk et al. (1996) reported finding a significant association between mental health problems and acculturative stress, making acculturative stress a likely risk factor in the development of SMPI.

Stress-Vulnerability Theory

According to the traditional disease theory, a healthy organism is a symptom-free organism that is able to withstand internal and external factors, as well as interaction between the two factors that disturb homeostasis (Engel, 1960). Audy (1971) argued that diseases and disorders ensued when healthy organisms were no longer able to maintain a dynamic equilibrium against insults continuously emanating from various environments. The vulnerability of an individual determines the frequency and propensity of these insults to disrupt these homeostatic traits, sliding into a state of decline and disorder. In the late 1970s, Zubin and Spring developed a stress-vulnerability theory that is essential to this work. It is not an accident that this work was included at the conclusion of the sub-chapter.

Zubin and Spring (1977) identified six traditional approaches to the etiology of SPMI as (a) ecological, (b) developmental, (c) learning, (d) genetic, (e) environmental, and (f) neurophysiological. The authors emphasized the significance that all of the above approaches to psychopathology had a common denominator of stress vulnerability. Zubin and Spring reported significant findings based on a logical factors analysis that suggested all six approaches included a parameter of vulnerability. The stress-vulnerability theory proposes that any individual with a certain level of vulnerability will express symptoms of schizophrenia if exposed to suitable circumstances. The theory summarizes various platforms reviewed above in a coherent and relevant fashion by connecting the influence of immigration-related stress and proclivity to develop SPMI, particularly psychotic spectrum disorders.

The aforementioned theories provide the foundation to this study on how immigration-related stress might contribute to the formation of psychotic spectrum pathologies among a subclinical population of U.S. immigrants from Central Asia. The research questions above aim to determine the predictive power of psychological and psychosocial factors as possible contributing factors to psychoticism.

Nature of the Study

This work aimed to analyze relationships between numerous variables, therefore, the nature of the study is quantitative. Quantitative studies employ different research designs, and because I analyzed relationships between the dependent variable and independent variables, the design of this study is correlational. Chiang et al. (2015) stated that correlational studies analyze noncausal relationships between variables without manipulating independent variables. Traditionally, statistical operations of studies investigating relationships include parametric and nonparametric correlations and regressions. In this work, hierarchical multiple linear regression was used to analyze relationships between variables. Similar to regular multiple regressions, hierarchical multiple regression analyzes the amount of variance in the dependent or outcome variable that is attributable to the variance in the predictor or independent variables (Ross & Willson, 2017). Therefore, the selection of the research design was aligned with the purpose of the study and answered the research questions.

The main objective of this study was to measure the variability of psychoticism under different conditions. Thus, the dependent variable in this study was the level of psychoticism. The variable was measured on the continuous level of measurement.

Independent variables were comprised of different parameters measured on continuous and categorical levels of measurement. Continuous independent variables were hostility, interpersonal sensitivity, obsessive compulsiveness, and age upon arrival in the United States. Independent categorical variables were gender of participants and English language proficiency.

This study utilized archival data collected and transcribed at a private, multi-disciplinary outpatient mental health practice located in Brooklyn, New York, 11229. The data included scores on the SA-45 (Strategic Advantage, 1996), with subscores in the areas of psychoticism, hostility, interpersonal sensitivity, and obsessive-compulsiveness. Individual cases also contained information obtained from personal interviews, namely, English language proficiency, age of immigration, and gender.

The sources of psychological and psychosocial data were based on self-reported information shared upon signing informed consent forms. I coded the above information on a patient-by-patient basis. To protect privacy, each dataset was assigned a numerical code, randomly selected by a computerized number generator. This study utilized multiple and hierarchical regressions and the analysis of mediation as standard statistical operations. These operations were aligned with the purpose of the study because they provided interactive analysis of how independent variables moderated each other's effect on the dependent variable.

Definitions

This quantitative research utilized one dependent variable and six independent variables. The dependent variable was *psychoticism*. In this study, this variable described

an individual's experiences of detachment from reality, including thought insertion and auditory voice hallucinations (AVH). This continuous variable was derived from the SA-45 (Strategic Advantage, 1996).

Acculturative stress referred to emotional strain and psychological challenges associated with immigration. Da Silva et al. (2017) stated that acculturative stress consisted of psychological and social stress based on the incongruence between the culture of an immigrant and the host culture.

Age upon arrival or *age of immigration* described how old the participant was when they immigrated to the United States. This continuous variable was derived from a patient's interview.

English language proficiency described how well a participant mastered the use of English. This categorical variable was derived from patients' interviews.

Hostility described a participant's propensity to destructive and unfriendly behaviors. This continuous variable is derived from the SA-45 assessment (Strategic Advantage, 1996).

Interpersonal sensitivity described a participant's evaluation of self in relationships to others. This continuous variable was derived from the SA-45 assessment (Strategic Advantage, 1996).

Obsessive compulsiveness described unwanted and intrusive thoughts leading to distressing feelings and repetitive behaviors. This continuous variable was derived from the SA-45 assessment (Strategic Advantage, 1996).

Psychiatric comorbidity was the term that described a co-occurrence of two or more psychiatric disorders within a specific period (Thaipisuttikul et al., 2014). Often, psychiatric comorbidities contribute to the exacerbation of SPMI symptoms.

Psychosocial characteristics were variables that reflect individual differences from cultural, ethnic, spiritual, and other perspectives. This study utilized three psychosocial variables: (a) gender, (b) age of immigration, and (c) English language proficiency.

Psychotic continuum was a psychological theory that presumed a spectrum approach to psychosis ranging from an extreme of abnormality to the normalcy of a healthy state (Luhrmann, 2017).

Serious persistent mental illnesses (SPMIs) were a group of severe mental disorders, often leading to long-term disability. DSM-5 identifies major depression, bipolar disorder, schizophrenia, and bipolar disorder as SPMIs (American Psychiatric Association, 2013).

Vulnerability to stress described abilities of a human being to deflect the detrimental impact of stressful events (Birley, 1973). Inability to cope with stressful events might have negative effects on mental health.

Assumptions

Assumptions are an integral component of any properly conducted research because they provide ground for what is acceptable and plausible. Wargo (2015) stated that assumptions were important because they established presumptions of truth pertaining to particular work. This study was based on several assumptions.

First, it was assumed that the population sample was homogenous enough to share similar ethnical characteristics, religious affiliation, cultural heritage, and other general demographics to be objectively included in one group. This assumption was necessary to establish because if the heterogeneity of the population is too high, the diversity of it would preclude participants from inclusion in one cohesive group.

Secondly, it was assumed that all participants in the study were honest in providing self-reported information about their individual experiences. This assumption is supported by the protection of privacy, which was stipulated in the informed consent to receive psychological services. In addition, the protection of participants' privacy was assured by ascribing numerical values to the cases instead of using names. The same approach was utilized to protect other identifying information, such as place of birth, gender, diagnoses, and other personally identifiable information (PII). This assumption was supported by the recent changes in the immigration policy to restrict the immigration of people with mental disabilities. Herreria (2020) stated that the US immigration services imposed strict rules to bar immigrants from entry or receiving Green Cards for individuals with diagnosable mental illnesses and a history of harmful behaviors to themselves and others.

On the other extreme of underreporting, it is assumed that individuals would refrain from minimizing their symptoms because either Green Card petitioners or individuals who wish to change status have to undergo a medical examination and disclose information about their mental health. If medical examiners suspect applicants of malingering (i.e., deliberately providing false information) or confabulation (i.e.,

unintentionally providing false information), it might cause severe consequences, up to and including denial of the immigration application (Benadum, 2020).

Finally, it was assumed that despite individual differences, participants in the study would have similar responses to psychological comorbidities in relationship to the development or exacerbation of psychotic symptoms.

Scope and Delimitations

The scope of this study was to analyze psychological and psychosocial determinants of psychoticism among individuals born in Central Asia who immigrate to the United States from 2010 to 2020. The research focused on adult immigrants from different backgrounds who came to the United States at a different age and resided in the United States for different periods of time. For the study, I used archival data collected at a psychological practice located in Brooklyn, New York, from 2010 to the present.

To establish internal validity, a study must have boundaries of the scope and standards of exclusion (Slack & Draugalis, 2001). The population sample excluded minors under 18 years old and adults older than 85 years old. The scope of the study included individuals immigrating to the United States from Kazakhstan, Kirgizstan, Tajikistan, Turkmenistan, and Uzbekistan. The study excluded other Central Asian countries such as Pakistan and Afghanistan. This inclusion is based on the legacy of those specific countries to be a part of the Soviet Union, with each sharing a cultural identity related to that commonality. This study also excluded individuals from nonnative Central Asian ethnic groups, for example, Russians born in Uzbekistan. Therefore, the findings of the study will not be generalizable to other ethnic groups. The findings of the study also

might not be relevant to the second generation of immigrants born in the United States to Central Asian parents. The findings of the study are not generalizable to a population carrying acute psychotic diagnoses. A significant portion of responses included closed-ended Likert-type answers; therefore, participants could choose only given answers, eliminating the possibility of more detailed or precise alternative answers.

Limitations

Investigations of the subjective human experiences impose significant limitations on this study. There is no generally acceptable quantifiable approach to measure such experiences objectively. Therefore, studies of these experiences involve a number of participants, and results could be generalizable to one degree or another depending on limitations of internal, external, construct, and other types of validities. The internal validity of a study is how well the design of the study answers a cause-effect relationship between variables in the study without methodological mistakes (Patino & Ferreira, 2018).

The study did not investigate cause-effect per se; it aimed to analyze the predictive impact of independent variables on the dependent variable. In this work, I analyzed associations between the variance in psychoticism as a dependent variable and variances in independent variables. The methods of the study measured what they were designed to measure. However, while utilizing multiple regression is aligned with the design study and research questions, there might be limitations in construct validity. Steckler and McLeroy (2008) defined construct validity as the congruence between operational variables and theoretical constructs. The number and meaning of the variables

appeared to be aligned with the theoretical foundation of the study, although the main and combined effects of variables are not exhaustive. For example, the variability of the dependent variable might be influenced by independent variables not accounted for and interactions between variables might affect the analysis. Since the study used archival data, there is no ability to modify data collection to account for these variables.

Secondly, a portion of data was missing due to different reasons (e.g., participants did not answer all the questions), and while the missing answers were not prevalent, they might contribute to objectivity deviation. There are limitations to this study in terms of external validity. External validity is the degree of usability of the findings of the study in pertains to other populations, measures, locations, and treatments (Steckler & McLeroy, 2008). In this study, the selection of participants limits the generalizability of the study to other population groups. Individuals that immigrated to the United States from the countries located in the Caucasus region have significant socioecological differences from immigrants from Central Asia. Utilization of the study findings might be of minimal value when applied to other immigrant populations. In addition, the same population might, under different conditions, demonstrate different outcomes. For example, immigrants from Central Asia to European countries instead of the United States might face different challenges because of the difference in cultures of host countries.

Possible sources of biases have been addressed by the implementation of quality control measures. To avoid selection bias, I used several overlapping sample size approaches, namely, G*Power calculator and previous studies in the field.

To avoid performance bias, I assigned numerical codes to selected participants from the same population, thus implementing a blind and enhanced unbiased approach. Data were produced by standardized, valid, and reliable psychological instruments with a high level of external and internal validity. In addition, several sources of information, such as medical records, patients' interviews, and observations were used to enhance the accuracy of the study.

Significance

Investigation of causalities and correlations between psychosocial factors and psychological disorders among immigrants is a matter of interest to a number of stakeholders. Such a complex problem lies at the intersection of multidisciplinary avenues, including law, medicine, law enforcement, and policymaking. Mental health providers are potential beneficiaries of this study. The findings of this study are expected to enrich the existing research with new approaches using previously unaccounted variables, the understudied population of Central Asian immigrants, and increased population size.

Another significant beneficiary of this research might be law enforcement because unattended mental health illnesses may lead to unlawful behaviors (Ghiasi et al., 2020). It is worth noting that individuals with mental health illnesses are more prone to become victims of crimes than perpetrators (Ghiasi et. al., 2020). The next group of potential beneficiaries of the findings of this study is immigration attorneys. According to regulations, individuals diagnosed with mental illnesses have both restrictions and benefits when they come in contact with immigration law. In some instances, individuals

could be exempt from naturalization interviews based on cognitive abilities, while in other instances, individuals might be subject to restrictions when it comes to receiving visas to legally come and reside in the United States.

Potential beneficiaries of this study also include public policymakers. Politicians and other figures might be better informed to determine admissions criteria for immigration, define reimbursement rates for healthcare providers, and housing policies for the mentally ill immigrants. It is not uncommon that decisions that change policies lead to unintended consequences. In one case, the immigration amnesty of 1986 aimed to finish illegal immigration. However, the number of illegal immigrants grew more than twice since the policy was implemented (Plumer, 2013). Therefore, policymakers might significantly benefit from the study of mental health illnesses among immigrants, as counterintuitive outcome that can result from such research.

Summary

Optimal psychological functioning is an equilibrium that is supported or offset by various factors, both external and internal alike (Shekunov, 2016). This work investigated the main and interactive effects of psychological and psychosocial factors on the development and exacerbation of psychoticism, which is a significant indicator of SPMI. The population of interest is immigrants from the countries of Central Asia to the United States, who account for a significant portion of newcomers to the country. In this chapter, I provided the groundwork for a problem that needs investigation, directions for the investigation, and methods of the investigation. I also described preventive measures implemented to assure unbiased research, establishing acceptable standards of validity.

The next chapter will reinforce the theoretical foundation of this study by reviewing recent and relevant literature that addresses similar problems. The strategy used to search for pertinent published materials will be substantiated and justified. The chapter will conclude with an explanation of how the present study closes a significant gap in knowledge about the relationship between psychoticism and psychosocial factors.

Chapter 2: Literature Review

Modern society is characterized by higher mobility of members and migration of population due to technological, social, economic interests, among other factors. According to the United Nations (2020), the number of people residing in countries other than countries of their birth reached 272 million in 2019. In the United States, the number of naturalized citizens/legal residents is more than 40 million (The Pew Research Center, 2020).

Migration is not only a global demographic phenomenon; it is a deeply individual process that is different for each immigrant. While immigrants have different reasons to seek a better future for their families, they face uncertainties and challenges of traveling and assimilation. Such challenges are often detrimental to their mental health, associated with the development of new disorders or worsening existing symptoms (Wickramage et al., 2018). Shekunov (2017) stated that immigration difficulties were associated with a decline in the mental health wellbeing of newcomers. The author noted that immigrants demonstrated a two- to a three-fold increase of SPMI, particularly schizophrenia.

The idea of the detrimental effect of immigration on mental health is opposed by the healthy immigrant notion. This idea suggests that individuals who made decisions to immigrate were healthier in general and more resilient to mental health disorders than native residents (Alegria et al., 2017). Alegria et al. (2017) ascertained that first-generation immigrants (children of immigrants) were healthier in terms of physical and mental health in comparison to U.S.-born individuals. Such opposing views necessitate a further examination of factors that impact the mental health of immigrants.

Current literature on the subject of the mental health of immigrants (e.g., Alegria et al., 2017; Garcini et al., 2017; Giacco, 2019; Kaltenbach et al., 2018) provided reviews of major psychological disorders among various groups of immigrants entering different host countries. However, the problem of mental health challenges in the immigrant population has not been adequately addressed. For example, Ismayilova et al. (2014) provided an analysis of living and working conditions and the mental health of immigrants from Central Asia to the Russian Federation. Although the authors addressed the population that my study focused on, the differences in the specifics of the host countries, the Russian Federation and United States, may account for significantly different results.

The study of Kashyap et al. (2019) addressed mental health challenges of individuals migrating to the United States but focused on symptoms of PTSD and depression, not psychotic spectrum disorders. Stouten et al. (2019) compared psychosocial functioning and symptoms profiles of the first-episode psychosis between Dutch and immigrants. While symptomatology is similar to that in my study, the culture of the host country may have a different effect on the development of psychosis among immigrants. Despite the global nature of immigration, this population is not sufficiently studied, leaving gaps in the knowledge of the main effects and interactions between various psychosocial factors and mental health disorders among immigrants (Derr, 2016; Sangalang et al., 2019).

The purpose of this research was to investigate associations between psychological factors and mental health disorders among immigrants from Central Asia

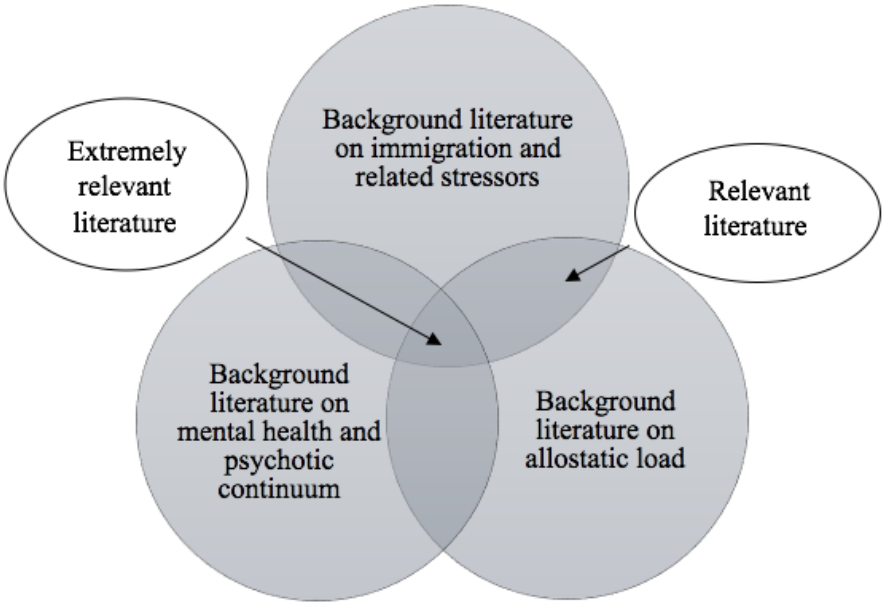
to the United States. This chapter will elaborate on search strategies and provide the scope of the literature review. The chapter will continue with the description of major theoretical propositions used in this work. Later in this chapter, I substantiate the selection of variables by making references to existing literature. The direction of this work and how it closes the knowledge gap will conclude this chapter.

Literature Search Strategy

Numerous modes of transmitting information exist, for example, video reporting, audio broadcasting, animation, and so forth. However, literature remains the most accessible and prevalent source of sharing knowledge. Wenzel (2005) stated that literature played an essential role in generating knowledge and critical thinking. This study used various databases and search engines to substantiate the validity of the theoretical foundation of this study, validity, and relevance of parameters manipulated and measured. The study was based on three major theoretical platforms: (a) psychotic continuum, (b) immigration as a stressful life-event, and (c) impact of immigration on mental health. The literature on each theory was assessed as a singular construct and in conjunction with others. The Venn diagram in Figure 1 illustrates the approach of the proposed study in finding relevant literature. For example, the intersection of two circles represents a set of articles that is considered relevant, and the intersection of the three circles symbolized extremely relevant literature.

Figure 1

Literature Search Strategy



Note. The figure illustrates the approach to literature search by relevance to the focus of the study. For example, a search for literature on immigration and mental illness would be represented as the intersection of two circles, whereas literature for immigration only would represent background studies.

I began the review of literature through the Walden library, particularly the search engine Thoreau, using the following keywords: *immigration*, *psychoticism*, *acculturative stress*, and *psychosocial factors*. Using the search for the combination of *immigration*, AND *psychoticism*, AND *psychosocial factors* returned minimal results of only two articles. Therefore, the search strategy was adjusted to expand the process by using different combinations of different keywords. The search on i*mmigration* AND *mental health* returned 17,000 items, including 13,403 academic journals, 1,404 dissertations and

theses, 1,306 books, 592 news articles, and 517 magazine articles. After the identified publications were limited to peer-reviewed sources within the past 5 years, the search narrowed to 5,193 articles and books. Further constraints were applied, thus focusing the search on *acculturative stress*, using this phrase as the key term. The search returned 117 items retrieved from the following databases: APA PsychInfo (42 articles), Academic Search Complete (13), Social Sciences Citation (13), MEDLINE (11), and APA PsychArticles (10). From this point on, the search strategy used more general keywords, such as *immigration* and *mental health*, with added specific keywords relevant to psychosocial factors (age of immigration, language proficiency, and gender). Search for *immigration* AND *mental health* AND *acculturative stress* AND *age* returned 16 peer-reviewed articles provided by APA PsychInfo, CINAHL plus, APA PsycArticles, Medline, and Academic Search Complete. This approach to the literature search provided relevant published sources that informed and shaped this research.

Utilizing keywords from the list of variables further provided this study with specific information about particular parameters of interest. For example, using general keywords *immigration* AND *mental health* AND *acculturative stress* AND *nationality /ethnicity* as a narrower search modifier returned nine peer-reviewed articles published within 5 years. Literature items were obtained from APA PsychInfo, SocINDEX, APA PsychArticles, Academic Search Compete, Complementary Index. Search using keywords *immigration* AND *mental health* AND *acculturative stress* AND *religion* returned five contemporary peer-reviewed articles provided by APA PsychInfo, SocINdex, APA PsycArticles, Academic Search Complete, and Complementary Index.

Although this work is focused on psychoticism as a precipitating factor of SPMI, the key phrase *mental health* was used because psychological disorders such as hostility, interpersonal sensitivity, and various phobias might contribute to the development of SPMI. Such comorbidities are included in statistical analysis as independent variables, which will be discussed in greater detail further in this chapter.

The scope of the literature used in this study can be divided into two major groups: seminal and contemporary. Seminal literature provided background, informing readers about the theoretical foundations of this research. For example, Lee developed the theory of migration in the 1960s, making the article chronologically outdated; however, this theory provides readers with the critical information necessary to understand the decision-making process precipitating immigration. In contrast, contemporary literature informs readers about new developments and research findings that are relevant to the discussion at hand, which are reported within the past 5 to 10 years. For example, Alegria et al. (2017) analyzed the roles of protective and risk factors contributing to the mental wellbeing of immigrants.

This research utilized both seminal and current literature to delineate theoretical foundations and accentuate new development, respectively. Aside from the chronological identifiers, the literature used in this study can be categorized as comprehensive and selective. Examples of comprehensive literature include systematic reviews and meta-analyses. For instance, Foo et al. (2018) provided a review of the literature regarding the prevalence of depression among immigrants. In contrast, the literature of selective scope accentuates particular aspects of the mental health of immigrants or particular

populations. Additionally, Ismayilova et al. (2014) reported findings of the study that focused on the mental health of migrants from Central Asia.

The main focus of this study was the investigation of psychological and psychosocial factors that possibly impact the level of psychoticism among Central Asian immigrants to the United States. While the literature on the intersection of mental health and immigration is comprehensive and elaborate, literature specifically pertaining to the population of Central Asian immigrants is scarce and fragmented. To establish the theoretical foundation, this research synthesized information obtained from different sources that reflected on the mental health of immigrants, not necessarily Central Asians. One search on keywords *immigration* AND *mental health* AND *Central Asia* returned seven articles; however, most of these articles were largely irrelevant to the subject of this work. Also, the present study utilized literature that focused on individuals of Central Asian descent who had not entered the United States. A purposeful selection of broad scope literature afforded an informational database that permitted further research on this topic.

Theoretical Foundation

This work is grounded in several theories that provide a foundation and situate this work among existing literature. The study relied upon a number of theories that describe and address (a) psychotic continuum, (b) acculturative stress, (c) the role of stress in psychotic disorders, (d) predictive power of psychosocial factors in the development of psychosis, and (e) the role of psychological comorbidities in the development or exacerbation of psychosis. Theories accounting for these aspects are

addressed below and include theory of psychotic continuum, theory of acculturative stress, and stress-vulnerability theory.

Theory of Psychotic Continuum

The theory of psychotic continuum postulates that subclinical and clinical populations might share similar symptoms that differ only qualitatively, not conceptually (e.g., in severity, frequency, and conviction). For example, AVH might be observed in individuals who are considered healthy and individuals diagnosed with SPMI (Johns et al., 2014). The theory originated from two primary models: the quasi-dimensional model (QDM) and the fully dimensional model (FDM). The former theory was pioneered by Meehl in the 1960s. The model proposed a presence of genetic variation that was responsible for the development of schizotaxia. Meehl (1962) ascertained that schizotaxia could give rise to schizotypy under particular circumstances. The clinical picture of schizotypy would be an exacerbated version of schizotaxia characterized by anhedonia, cognitive slippage, interpersonal distortions, and other symptoms. Schizotaxia would be a prerequisite for the advanced variation of schizotypy, which would develop into the final clinical stage of schizophrenia. The author stated,

> I postulate that a nonschizotaxic individual, whatever his other genetic makeup and whatever his learning history, would at most develop a character disorder or a psychoneurosis; but he would not become a schizotypy and therefore could never manifest its decompensated form, schizophrenia. (p. 81)

In his work, Meehl acknowledged the role of nongenetic factors contributing to the development of full psychotic presentations among individuals previously considered

without need of care. This reference to the importance of environmental factors is well-aligned with this work's hypotheses because an array of such factors was included in psychosocial determinant variables.

Another notable theory that further supported the concept of the psychotic continuum is the fully dimensional model developed by Claridge in the 1970s. The theory was the extension of the QDM proposing that psychotic symptoms exist across the full population, thus removing categories (e.g., schizotypy) in the middle of the continuum. For example, Claridge (1972) argued that psychotic manifestations could be adaptive (creativity) or maladaptive (detachment from reality) and were dependent on simultaneous variations along other dimensions, namely, intelligence. This particular interaction between creativity, intelligence, and psychotic symptoms is also present in Eysenck's work.

In a study of functional psychotic experiences among patients diagnosed with schizophrenia and manic-depressive disorder, Eysenck (1952) found that despite qualitatively different characteristics of normalcy and pathology, there was a continuum running from "extreme schizothyme to extreme cyclothyme" (p. 345). There are several major propositions that support the theory. First, clinical profiles of individuals without acute psychiatric manifestations and patients with psychotic disorders bear significant similarities. DeRosse et al. (2014) reported significant overlap in the distribution of psychotic and psychotic-like symptoms across healthy controls and outpatients diagnosed with schizophrenia and schizoaffective disorder. Other literature on clinical profiles included Armando et al. (2010), Krabbendam et al. (2004), Wigman et al. (2011), Yung

et al. (2006), and others. Secondly, general and clinical populations share common demographic factors. For example, Linscott and van Os (2013) identified age, minority or migrant status, income, education, employment, marital status, et cetera to be significant predictors of psychotic experiences on the psychosis-proneness-persistence-impairment continuum. The last article is particularly important to this study because the authors emphasized the risks of psychotic experiences associated with migrant groups alongside other psychosocial factors.

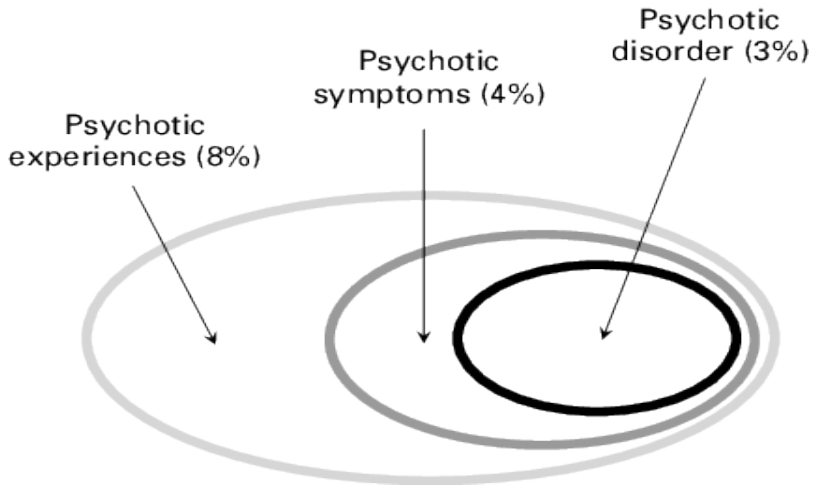
Radua et al. (2018) also conducted an analysis of known demographic factors increasing the risk of developing psychosis. The authors examined associations between psychosocial, familial, and perinatal factors as antecedents of psychotic disorders, thus, substantiating the theory of psychotic continuum. Other literature includes Fonseca-Pedrero and Debbane (2017) with analysis of distributions of psychosis phenotype, Kline et al. (2012) study on prodromal and high-risk states leading to psychosis, DeVylder et al. (2014) study of psychosis-like experience in a large subclinical sample, and others.

Demographic factors are not only found to influence the progression of psychosis. Experiential factors also play an important role in such developments. Johns et al. (2014) emphasized the association between traumatic life events and the exacerbation of psychotic symptoms (AVH in particular) among individuals without the need for care as well as patients with such needs. This research angle of the above article is particularly valuable to the topic of the proposed study because life events such as immigration might be a significant contributing factor in shifting psychiatric presentations between extremes of the continuum. Finally, the theory of the psychotic continuum was supported by

research on family-based studies (DeRosse, 2015). Figure 2 illustrates the extremes of normality and pathology in the psychotic continuum.

Figure 2

The Proneness-Persistence-Impairment Model of Psychotic Continuum



Note. The figure illustrates the continuum between psychotic experience and psychotic disorders. From "A Systematic Review and Meta-Analysis of the Psychosis Continuum: Evidence for a Psychosis Proneness-Persistence-Impairment Model of Psychotic Disorder," by van Os, J., Verkooyen, R., Hendriks, M., Henquet, C., Bak, M., Marcelis, M., Delespaul, P., Krabbendam, L., & Myin-Germeys, I., 2008, *Psychological Medicine, 39*, pp. 179-195. Copyright 2008 by Cambridge University Press.

Extensive literature (Avramopoulos et al., 2002; Debbane et al., 2015; Kalmady et al., 2020; Lui et al., 2018; Schurhoff et al., 2007; Stefanis et al., 2007) established associations between genetics as a high-risk factor in the emergence of psychotic-like experience and leading to psychosis under certain conditions.

The psychotic continuum theory is particularly valuable in supporting the idea behind the proposed research. Individuals who do not demonstrate symptoms of SPMI might develop clinical presentation due to life-changing events, namely immigration. Research questions of this study concentrated on investigating the association between the level of psychoticism and psychosocial factors. In this effort, this research aimed to find out which factors were significant predictors of variance in psychoticism. For example, among other factors, this work investigated the impact of the age of immigration as a potentially protective factor against psychoticism. The methodology of the analysis is congruent with the idea of the psychotic continuum because all these factors have the potential to influence the development or exacerbation of psychoticism among immigrants secondary to acculturative stress.

Stress-Vulnerability Theory

Mental health disorders, as a progression from normalcy to pathology, have extremely complex etiologies that include multi-dimensional predictive factors. Carter et al. (2002) stated that univariate models were appropriate and accurate approaches to test concrete hypotheses but they were narrow-focused and produced limited predictive efficacy in determining the origins of illnesses. Current literature offers an array of domains that predict the development of symptoms of SPMI. Pahl et al. (2015) identified the variables of level of education, psychological symptoms, tobacco use, poor physical health, and financial difficulties to be significant predictors of utilization of mental health services. Soltys and Tyburski (2020) reported the important roles of social support and the sense of self in deflecting risks of developing mental challenges. A more

generalizable large sample size study by Beard et al. (2007) reported that adverse life events, poor physical health, and high neuroticism were significant predictors of developing SPMI. The variability of causing and contributing factors is vast and unique in every single case; however, certain generalizations are plausible and accurate.

In the 1970s, Zubin and Spring developed the stress-vulnerability theory (SVT) to address the impact of stressful life events on human mental wellbeing. Zubin and Spring (1977) stated that vulnerability was a common denominator of major factors contributing to the development/exacerbation of mental illnesses, including ecological, developmental, learning, genetic, and neuropsychological factors. The authors developed a theoretical foundation of vulnerability to mental disorder by drawing parallels between exogenous/endogenous challenges that elicited stress-related responses in humans.

The SVT is rooted in the works of Bleuer, who disagreed with the categorical approach of diagnosing schizophrenia pioneered by Kraepelin. Bleuer (1911) offered a qualitatively new hierarchical method of primary and secondary phenomenology. According to the author, schizophrenia was an overarching term for a distinct subgroup of illnesses that demonstrated symptoms sufficiently different from each to warrant such distinctions. In addition, the author stipulated that classic symptoms did not necessarily indicate diagnosable conditions because they could be manifested in the general population, as well.

Another influence on SVT's development is traceable to work of Schneider, a German psychiatrist known for work on diagnosing criteria for schizophrenia and pathological personalities (Nordgaard, 2008). Schneider further developed the

hierarchical approach pioneered by Bleuer and proposed that some symptoms were more applicable and instrumental to particular diagnoses. Schneider (1959) argued for distinctions of subclinical personality variations (e.g., among creative individuals) and diagnosable mental disorders, thus, leaving room for the vulnerability of individuals (or resilience) to oscillate between the categories. Schneider (1959) postulated that first-rank symptoms of psychosis were the most influential manifestations clinicians observe and report. Mayo et al. (2017) stated that vulnerability imposed on an individual by stressful life events was associated with the increase of the first-rank symptoms, possibly leading to diagnosable SPMI.

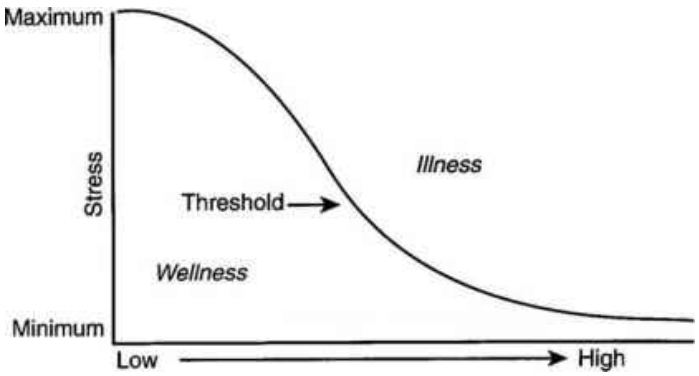
The SVT postulates that a person could demonstrate an increased susceptibility to be vulnerable to the development of SMPI due to inborn or acquired factors. Zubin and Spring (1977) identified "inborn" as genetic profiles, internal environment, neurophysiology of the organism, et cetera. The author stated that the "acquired" component of vulnerability was due to the impact of the external environment, such as family dynamics, peer interactions, traumatic experiences, and other life events. The influence of stressful life events is a particularly valuable component of this work because immigration is an extremely stressful event (Schwarzer & Schulz, 2003).

According to the SVT, an individual with low vulnerability could withstand higher levels of stress (e. g., a number of minor multiple stressful life events or fewer events of higher magnitude) without developing mental illness. On the contrary, an individual with a higher vulnerability would not be able to return to the homeostasis of

the organism when exposed to the same stress events and would demonstrate a higher probability to develop SPMI as it is illustrated in Figure 3.

Figure 3

Stress-Vulnerability Model



Note. Adapted from "Vulnerability – a new view of schizophrenia," by J. Zubin and B. Spring, 1977, *Journal of Abnormal Psychology, 86*(2), 103–126. https://doi.org/10.1037/0021-843X.86.2.103. Copyright 1977 by Zubin and Spring.

Zubin and Spring (1977) defined stressful life events as occurrences such as natural disasters or life choices that challenge the adjustment abilities of an individual and cause significant reorganizations in one's life. Immigration is one of such life events; thus, the impact of immigration-related stress in people's lives will be discussed in the next subchapter.

Current literature is rich with publications that elucidate the influence of stress on psychiatric disorders. Hardy (2017) investigated trauma-related vulnerability factors and their role in the development of psychosis. Van Winkel et al. (2008) reviewed neurobiological mechanisms of the response of the human organism to stressors. Another article focused on biological correlations between stress and SPMI: Shah and Malla

(2015) investigated the role of hyperactivation of the hypothalamic-pituitary-adrenal axis in the context of a stress vulnerability model. Although the above publications provided readers with information relevant to the subject of this study, the work of Mizrahi is particularly pertinent to the topic of the proposed work. Mizrahi (2016) analyzed the impact of social stress factors on the development of psychosis, including a factor of immigration. The author focused on how social stress affected brain functioning via the dopaminergic system.

The SVT offers a useful addition to the psychotic continuum theory in the explanation of how each of us is "…endowed with a degree of vulnerability that under suitable circumstances will express itself in an episode of schizophrenia" (Zubin & Spring, 1977, p. 109). Exogenous circumstances such as immigration are factors that might play an important role in the course of mental health illnesses. In addition to the above, the SVT justifies inclusion in the analysis parameters of individual differences as risk or, on the contrary, protective factors that decrease the probability of development of psychoticism. This work analyzes the interaction between individual factors, including psychosocial parameters and mental comorbidities, among immigrants. Therefore, the literature that provides theoretical underpinning of the connection between stress and SMPI is exceptionally relevant as it determines the intellectual positioning of this work in academic and applied psychology.

Acculturative Stress

The theory of acculturative stress (AS) was developed by Berry and colleagues in the late 1980s and explained how cultural discrepancies between traditions of minority

cultures (including immigrants) and that of dominating cultures often cause political, economic, and psychological stress among representative of the minority group (Berry et al., 1987). The AS theory combines the ideas elucidated in the previous paragraphs and ties them with the subject of the proposed research.

The AS theory was built on the synthesis of several theories and concepts. One of the essential contributors to the AS was the concept of "culture shock", first discussed publicly by the Harvard anthropologist Cora Dubois in a 1951 speech at the Institute of International Education (Goldstein, 2013). The concept was further developed by Oberg in the mid-1950s, which included elaborations on the stages of cultural shock and how individuals progress through the rejection/adaptation continuum in the perceptions of cultures foreign to their own. Oberg (1954) identified several phases of the culture shock: (a) fascination with new cultures, (b) rejection of new cultural environments, (c) regression to and glorification of the culture of origin, and (d) acceptance of new cultures. The author stated that individual perception and adaptation to new environments vary greatly among people, which corresponds closely to the premise of the proposed study. However, while these concepts influenced Berry's AS theory, they focused not on immigrants but sojourners, who would travel for relatively short periods of time and eventually return to the countries of origin (Oberg, 1954).

Another essential component informing the AS theory was the theory of acculturation as a socio-psychological and anthropological phenomenon. The theory of group-level acculturation was pioneered by Redfield, Linton, and Herskovits in the 1930s. Redfield et al. (1936) outlined the definition of the term "acculturation" and

acknowledged that: “as many of the studies of acculturation now being carried on as is possible” (p. 149). The authors delineated research on acculturation by providing guidelines for the analysis of acculturation with a focus on the types of contact between populations (e.g., missionaries versus immigrants), situations that prompt acculturation (e.g., forced immigration or voluntary relocation), psychological mechanisms of acculturation (e.g., interpersonal and intrapersonal conflicts resulting from attempts to reconcile and integrate different cultural values and sets of social habits), and outcomes of acculturation (*viz.* acceptance, adaptation, and reaction). Based on these inputs, Berry and Kim (1988) developed the model of acculturative stress that identified cultural and psychosocial factors influencing the relationship between acculturative stress and mental health.

The central hypothesis of the AS theory is that acculturative stress among immigrants is prevalent yet not inevitable. This proposition of the theory is particularly valuable to this work because it provides a basis for the analysis of factors contributing to the vulnerability to develop mental health disorders. Another major component of the AS theory is that acculturative stress might have a biphasic effect on individuals. Berry and Kim (1988) stated that acculturative stress may have facilitated positive life changes among immigrants and enhance an individual’s abilities to self-development, leading to realizing an immigrant dream of building a new life. On the contrary, under similar conditions, other individuals might lose the abilities to integrate and become unable to succeed in goals they desired prior to immigration. The AS theory delineates factors that

influence the level of acculturative stress, implying that the effect of these factors is probabilistic, not deterministic.

Berry and Kim (1988) identified several groups of factors moderating the impact of the acculturative stress as (a) mode of acculturation, (b) phase of acculturation, (c) societal type in the destination country, (d) characteristics of acculturating groups, and (e) individual factors in the perception of the host cultures. The mode of acculturation describes the ways immigrants adapt to the new culture. Berry and Kim (1988) identified the following adaptation modes: (a) assimilation, when immigrants wish to adopt the value of the dominant culture and forego the original cultural identity, (b) separation as an intention to preserve original cultural ties and resilience to adapt to the host culture, (c) integration, when immigrants preserve old cultural values and simultaneously adopt new ones, and (d) marginalization as a rejection of both new and old cultural traditions. Phases of acculturation of the AS theory reflect on attitudes of immigrants toward the host culture. These phases include (a) contact, (b) conflict and (c) adaptation. According to Berry (1997), immigrants experience a sequence of such stages progressing towards adaptation over periods of time. This study did not differentiate participants based on acculturation phases; however, time since participants arrived in the United States was accounted for as a variable. The association of the length of immigration and mental health is researched in the modern literature (Alegria et al., 2017; Kirmayer et al., 2011; Straiton et al., 2014), addressing the relationship between the duration of immigration and mental health. It will be elaborated later in this chapter.

All participants of this research were individuals seeking permanent legal status in the United States. None of them were sojourners, involuntarily displaced persons, nor illegally trafficked individuals; therefore, the characteristic of the acculturative group is equally relevant to all participants. This work focused on individual characteristics of immigrants and factors moderating acculturative stress. These factors were relatively similar to all participant because they immigrated to the United States voluntarily. However, the destination country as an aspect of immigration is important to consider in other studies because the U.S. society is immigration-based, whereby, might be more open to embracing newcomers.

The AS theory connecting the acculturation process and individual differences of immigrants has been a solid theoretical platform for more than three decades and continues to support research that addresses these issues. Among other factors and individual characteristics, the proposed study will include psychological comorbidities such as hostility, interpersonal sensitivity, and obsessive-compulsiveness. Driscoll and Torres (2013), Ornelas and Perreira (2011), and Torres (2010) addressed correlations between psychological disorders and acculturative stress, which contributed to the theoretical foundation of this work.

The AS theory was a relevant theoretical platform for this study because it justified the selection of variables analyzed here and connected the main idea of the study to previously published work. For example, a critical component of this work - the analysis of induvial factors - is grounded in the AS theory because the mental health of different people might be affected by similar factors leading to different manifestations of

mental health. The authors of the AS theory emphasized that factors affecting the level of acculturative stress were probabilistic, thus, accounting for individual differences. All research questions of this research included various individual characteristics that were influential, to one degree or another, in the development of mental health issues among the population of the study. The elaborate review of variables utilized in this analysis is provided in the next subchapter.

Literature Review Related to the Key Variables

The purpose of this study was to analyze associations between psychoticism as a foreteller of SPMI, psychosocial factors, and psychological comorbidities. Current literature offers an array of sources on the subject. Since this research investigated the effect of psychological conditions on the development of psychoticism and psychiatric comorbidities are known contributing factors to the disorder (Buckley et al., 2009), the search was not limited to "psychoticism" per se, rather expanding it to "mental illnesses". Such an approach afforded a wider exploration of psychological comorbidities coupled with psychosocial factors. The analyses of literature returned several common trends and could be categorized by foci of studies (e.g., psychoticism, psychological comorbidities, demographic factors, etc.), selection of population (the U.S. population, European countries), and methods (qualitative, quantitative, mixed). The following paragraphs will describe existing literature, concentrating of strengths and limitations of current research. Later in this chapter, the rationale for the selection of variables will be provided followed by the synthesis of studies relevant to research questions.

Current literature offers a wealth of published materials on the subject of psychosis and psychotic disorders among immigrants (Maraj et al., 2017; Selten et al., 2020; Whitley et al., 2017). Dykxhoom et al. (2019) analyzed the association between psychotic disorders (schizophrenia, schizoaffective disorder, etc.), immigrant status, region of origin, and age of immigration to Sweden. Tortelli et al. (2015) investigated the variability of the adult-onset of schizophrenia among Black-Caribbean immigrants to the U.K. Hernandez et al. (2019) investigated relationships between social factors and the duration of untreated psychosis among immigrants in the United States. There is another group of studies that focus on the association between psychological comorbidities and psychosis among immigrants. Current literature investigates the connection between psychosis and depression among immigrants (Terrazas & McCormick, 2018; Walters, 2019; Zhou et al., 2019) and anxiety (Hsieh, et al., 2016; Steel et al., 2017; Zayas, 2018). Several studies identified an association between psychosis and PTSD symptoms (Carroll & Chamberlain, 2019; Giliver et al., 2014). Co-occurrence of obsessive-compulsive tendencies and psychotic disorders were also reviewed in current literature (Brander et al., 2016; O'Connell et al., 2018), along with interpersonal sensitivity, as feeling self-conscious and lacking self-confidence (Kirmayer, 2011; Salas-Wright et al., 2019). Other contributing factors to psychotic disorders, such as paranoid ideation was investigated in current research (McIntyre et al., 2019; Monsonet & Kwapi, 2020; Pearce et al., 2019), various phobias (Pignon et al., 2017; Salas-Wright et al., 2018; Soegaard et al., 2020), and aggression/hostility (Gambaro et al., 2020; Mindlis & Boffetta, 2018).

This study utilized a quantitative approach and modern literature offers a number of publications using these methods. According to Blackmore et al. (2020), quantitative literature on the subject of mental health illness among immigrants consisted of randomized control studies (Hwang et al., 2012; Kiropoulos et al., 2011; Zerger et al., 2014), longitudinal research (Davison et al., 2019; Schwartz et al., 2015; Sirin et al., 2013), and cross-sectional research (Durbin et al., 2015; Hollander et al., 2011; Johnson et al., 2017).

The studies of mental illnesses among immigrants employed various strategies with different strengths and weaknesses. For example, the cross-sectional study of Hollander et al. (2011) produced a large population sample with various demographic characteristics (gender, age, marital status, education level, etc.). The study, however, was conducted in Sweden, which might limit applicability to the proposed study. The strengths of cross-sectional studies are a quick collection of data and limited expenses (Wang & Cheng, 2020). The weakness of cross-sectional studies is the inability to measure occurrences, difficulties to make causal inferences, and susceptibility to biases (Wang & Cheng, 2020). Longitudinal studies presented in this review are more detail-oriented, elaborate, more equipped against biases, and analyze relationships between variables (Cherry, 2020). However, they have their weaknesses as well. Longitudinal studies are vulnerable to dropouts of participants, which might affect the validity and reliability of research, they are expensive to conduct and time-consuming (Cherry, 2020). Despite the increased validity of longitudinal studies, their contribution to the proposed study might be limited due to sample sizes, populations, study focus, et cetera. A three-

wave longitudinal study conducted by Sirin et al. (2013) investigated trajectories of internalizing mental health symptoms and abilities to negotiate acculturative stress. The population, however, was selected among 10th grades with the concluding phase in one year from the time of inception. Therefore, some participants would be younger than the cut-off age for the proposed study (18 years old). Despite the restricted relevance of some articles, the review of literature provided this study with the foundation for the theoretical framework of the research, the aim of the study, selection of populations, and variables. Not all studies used the same approach to the target population. Some studies used a comparative approach within groups of immigrants, accentuating on correlations between different demographic variables, while others used between groups of immigrants (Kiropoulos et al. 2011compared immigrants from Greece and Italy), and others compared immigrants and natives (Salas-Wright et al., 2019). The selection of studies is based on the alignment between constructs and methods of previous research and that of this study.

Justification of the Selection of Variables

As it is evident from the above, modern literature underlines the significance of psychological commodities and demographic factors in the mental health of immigrants. This study utilized interpersonal sensitivity, hostility, and obsessive-compulsive tendencies among immigrants as psychological comorbidities contributing to psychoticism. Also, the proposed research investigates the role of psychosocial aspects of gender, English language proficiency, and age of immigration in the development of psychoticism in this population. In pertains to selected variables, modern literature offers

a number of publications that reflect on associations between variables and set directions for future research.

Urzua et al. (2019) reported a significant mediating effect of self-esteem on the relationship between discrimination and mental illnesses. The significance of the variable in the context of psychotic etiology warranted the inclusion into this research. Salas-Wright et al. (2014) identified connections between anger, hostility, and mental disorders among immigrants. The authors delineated a strategy for future research in the direction of expanding studies that include different groups of immigrants due to the population's heterogeneity. Association between anger, hostility, and psychosis justifies the selection of the variable for the proposed study. Williams et al. (2020) reported significant correlates of obsessive-compulsiveness and psychotic presentations among the Black Caribbean population in the United States. Further research, however, is needed to investigate this association among groups of other immigrants, which give grounds to an investigation of the role of obsessive-compulsive symptoms in the population of Central Asians immigrating to the United States. Castillejos et al. (2018) reported the association between gender (among other socio-ecological variables) and psychosis among immigrants. Van der Ven et al. (2016) reported differences in the prevalence of psychosis between male and female groups of the North African immigrants to Sweden. Such findings explain the inclusion of this variable into this study.

Ventriglio et al. (2020) found a significant association between poor language skills and the first episode of mental illness among African immigrants to Italy. Anderson and Edwards (2020) reported elevated risks of psychotic disorders associated with the age

of immigration. Also, Anderson and Edwards (2020) defined strategy for further research as the expansion into the analysis of other aspects of underlying etiological factors (e.g., family dynamics, duration in the host country, etc.).

The target variables that will be in this study were previously investigated in the modern literature. However, it is the consensus of published sources that further research is needed on the subject of psychosis and psychosocial variables as potentially contributing factors (*inter alia*, Castillejos et al., 2018; Salas-Wright et al., 2014; Ventriglio et al., 2020). The goal is achievable through the expansion into different populations and the inclusion of various parameters.

Key Variables of This Study

Foci of current research include an array of mental disorders, including the following constructs relevant to this study: (a) psychoticism, (b) interpersonal sensitivity and emotional vulnerability, (c) anger and hostility, (d) obsessive-compulsive tendencies. These variables will be the part of the psychological component of the study, with the psychosocial factors being: (a) gender of immigrants, (b) English language proficiency, and (c) age of immigration.

Quantitative studies of Boydell et al. (2001), Schofield et al. (2017), Schofield et al. (2018), Stouten et al. (2019), Vassos et al. (2012) provided analyses of factors contributing to the development or exacerbation of psychotic symptoms among immigrants. Another group of quantitative studies addressed the emotional toll of self-consciousness and interpersonal sensitivity emerging among immigrants. Such studies include Browne et al. (2017), Nesterko et al. (2018), Mayorga et al. (2018), and others.

Some studies (e.g., Bakhshaie et al., 2018; Paulus et al., 2019) accentuated the role of acculturative stress in the emergence of emotional symptoms that could contribute to the development of psychotic tendencies. It is not uncommon for the feeling of cultural discomfort to occur at the intersection of different cultures as a conflict between cultural identities of immigrants and cultures of host societies (Lechuda & Fernandez, 2012). These immigration-related challenges often manifest themselves in anger and hostility among immigrants toward the host society (Chavez et al., 2019; Garcia et al., 2017; Mangold et al., 2007) as contributing factors of SMPI or warning signs of the exacerbation of SPMI symptoms (Faay & van Os, 2019). In addition to hostility and anger, other behavioral patterns emerge as coping mechanisms to negotiate immigration-related stress. In contrast to hostility and anger often fueled by impulsivity, obsessive-compulsive traits manifest in rigidity, parsimony, and orderliness (Hertler, 2015). Such patterns might appear to immigrants as plausible strategies aligned with future-oriented goals and based on dedication and self-discipline. However, obsessive-compulsive traits are known to co-occur with psychosis (Cederlof et al., 2015) and mimic psychotic symptoms (Raveendranathan et al., 2012). Although the literature on the psychological variables used in the proposed study exists, it is not exhaustive and requires further explorations. For example, there were no quantitative studies including variables of the proposed study among individuals who originate from Central Asia or studies that concentrate on populations of these individuals relocating to the United States.

Another group of variables was used in this study pertains to psychosocial characteristics and include (a) gender of participants, (b) English language proficiency,

and (c) age of immigration. Current literature provides an insight into associations between these variables and psychosis. Gender or sex differences of patients have long been recognized as a potentially significant aspect of SPMI. Ochoa et al. (2012) reported findings of gender-related variability in schizophrenia and first-episode psychosis. Hui et al. (2016) found that male participants had poorer pre-morbid conditions, earlier onset, and more pronounced negative symptoms in comparison to female participants. Barajas et al. (2015) argued that males and females experience psychosis differently, which warranted further exploration of patient-centered treatment modalities, pharmacological interventions, and plans of care. However, there is no academic consensus in the evaluation of the association between gender and mental illnesses. There are studies that report gender differences in psychotic symptomatology. Dapunt et al. (2017) reported a higher prevalence of psychosis among male immigrants and Naes (2020) found a higher utilization of mental health services among men, as well. In contrast to that, Aleman et al. (2003) argued that sex differences in risks for the development of schizophrenia were not clear. In addition to that, Ochoa et al. (2012) stated that findings of symptomatology of gender differences of schizophrenia and psychosis were inconclusive in modern literature. Such disparities warrant further research.

The acculturative process might present newcomers with fewer challenges, depending on their English language proficiency. Existing literature considers the linguistic abilities of immigrants to be a significant factor in the mental wellbeing of these individuals. Valdez et al. (2013) accentuated the role of language in the acculturative process, particularly in the formation of social connections and acquisition

of recourses. Bauer et al. (2010) reported that immigrants with limited language skills were less likely to (a) identify a need for mental health services, (b) experience longer duration of untreated disorders, and (c) had limited access to mental health services. Ventriglio et al. (2014) stated that lack of language proficiency could compromise cultural adaptation, causing worsening of mental health symptoms and limit options for treatment. Language as a contributing factor to immigrants' mental health is not without controversy. For example, Abe-Kim et al. (2007) and Lee and Matejkowski (2012) found no significance in the role of language in the utilization of mental health services among Asian-Americans and Latino non-citizens. Further research is needed on the subject.

Age of immigration is one of the variables used in this study. Human beings demonstrate different sets of strengths and weaknesses at different ages, thus, different stages of development. The effects of these characteristics are often biphasic: the flexibility of the adolescent mind contributes to easier cultural learning but might make the induvial more vulnerable to culture-based shock when exposed to other cultures. Modern literature provides a good but fragmented insight into the role of age of immigration in the development of psychosis. Shekunov (2016) stated that older age of immigrants could be associated with higher levels of acculturative conflicts, thus, more prone to the worsening symptoms of psychosis. Contrary to the above, Veling et al. (2011) argued that the younger age of immigration was associated with a higher prevalence of psychotic disorders. Anderson and Edwards (2020) reported findings of nearly doubled occurrence of SPMI among immigrants who relocated before the age of 18 in comparison to the native population. The authors stated that immigrants who

relocated as young adults demonstrated a lower risk of developing SPMI comparable with the native population. Kirkbride et al. (2017) stated that incidences of psychotic disorders were significantly higher among immigrants who relocated as children, adolescents, or adults. Uncertainty of findings regarding the role of age in the development of SPMI and heterogeneity of populations requires further research.

The main point of debate between researchers in immigrant studies is the validity of the healthy immigrant hypothesis. Numerous publications offer views of immigrants as individuals characterized by better psychical and mental health in comparison to the native population (Alegria et al., 2027; Riosmena et al., 2017; Vang et al., 2017). However, the opposite opinion is also present in the current literature; for example, Cantor-Graae and Selten (2005) reported an increased risk for immigrants to develop schizophrenia. Anderson et al. (2015), Bourque et al., (2011), Werbeloff et al. (2012) shaped similar findings of the increased prevalence of SPMI among immigrants. While this study did not aim to compare the proclivity to SPMI among immigrants vis-a-vis native-born individuals, the finding may contribute to the resolution of the dilemma of healthy immigrant.

Review and Synthesis of Studies Related to This Work

Research questions of this study analyzed predictive correlational effect of psychological and psychosocial characteristics of immigrants on the development of psychosis among individuals who immigrated to the United States from countries of Central Asia.

Current literature offers scarce publications on psychoticism on international migration to the United States from Central Asia. Studies of this population are limited to internal migration within territories of the former Soviet Union (e.g., Ismayilova et a., 2014; Marat, 2009) and included a limited number of studies using quantitative methods (Supiev et al., 2014). More general review of literature offers publications relevant to the research question of this study: the association between psychotic disorders and psychosocial factors. A number of studies found correlations between SPMI and psychological factors, such as hostility and related factors (Chavez et al., 2019; Garcia et al., 2017), interpersonal sensitivity and similar aspect of self-perception (Browne et al., 2017; Nesterko et al., 2018), and obsessive-compulsiveness (Hertler, 2015). Publications on the subject did not offer consensual views among researchers and some controversy remained. In relation to the psychosocial group of variables on this study, current literature addressed the association between psychoticism and gender (Dapunt et al., 2016; Hui et al., 2017; Ochoa et al., 2012).

Similar to the psychological variables, there is not a unified perspective on the association between psychosocial variables and SPMI. Hence, this work investigated the significance of the relationship between psychological, psychosocial factors, and the proclivity to psychoticism.

Summary

Current literature offers a variety of research themes pertinent to immigration and mental health. Major themes were illustrated by literature about challenges of immigration and the consequences for the mental health of immigrants (Kirmayer et al.,

2011). The authors stated that the literature aimed to identify risk factors for this population in order to develop relevant mental health assessments, preventive strategies, and culturally approaches interventions.

A number of publications exist that explore the association between mental health deficits, psychological comorbidities, and psychosocial factors. A relationship between depression and psychotic symptoms is well researched and documented (Gaudiano et al., 2009; Ostergaard et al., 2014; Rothschild, 2013). Coexisting presentations of SMPI, anxiety, various phobias, and obsessive-compulsive features are also extensively studied. Bosanac et al. (2016) reported a correlation between anxiety, phobic manifestations, obsessive-compulsive symptoms, and psychotic disorders, Naidu et al. (2020) found a positive association between anxiety and the severity of psychoticism, Schirmberk et al. (2020) stated that patients with co-occurring obsessive-compulsiveness presented more severe psychotic symptoms, et cetera. While these findings are informative and useful, it remains uncertain how these factors interact in the immigrant population, particularly in the target population of this study. In relation to the immigrant population, it is particularly important to review correlations between PTSD and SPMI. Jobst et al. (2020) reported an increased risk for developing PTSD and exacerbation of SPMI among immigrants due to pre-immigration stress, challenges of migration, and settling in new countries. Psychosocial characteristics are also significant factors of the proclivity to SPMI because they account for individual resilience or proneness to deflect or succumb to immigration-related mental health challenges.

Modern literature is rich with publications on correlating psychosocial factors and SPMI. Nyer et al. (2010) identified marital status as a protective factor against the onset of schizophrenia. There is a number of studies that explore relationships between symptoms of SPMI and the age of patients (Kohler et al., 2007; McGrath et al., 2016).

Ochoa et al. (2012) investigated the impact of gender on the development/presence of psychotic experiences. While the prevalence of psychosis and schizophrenia was reported higher among male participants, the finding could be influenced by a higher level of substance abuse among male participants. Thus, the role of gender in the development of SPMI needs further investigation.

English language proficiency is an essential part of communicating competencies and might serve as a factor mitigating immigration-related mental health challenges. Bauer et al. (2010) reported language proficiency to be a significant factor of mental health as a barrier in accessing healthcare benefits. However, current research does not explore language competencies as a factor that impacts communal ties, resources, family dynamics, and assimilation of immigrants in the host society.

This study elaborated on the roles of psychological comorbidities and psychosocial factors in the development of psychoticism. This work analyzed relationships between obsessive-compulsiveness and psychotic proclivity, thus extending the work of Bosanac et al. (2016), Naidu et al. (2020), Sharma et al. (2019) by applying the findings to the population of Central Asian immigrants to the United States.

This study analyzed the main effects of hostility and interpersonal sensitivity on the development of psychoticism in this population, in addition to the main effects and

interactions with psychosocial factors. These factors include the age of immigration, advancing research of Kohler et al. (2007), McGrath et al. (2016), and others. Also, this research used other psychosocial variables, such as gender and English language proficiency. While the role of gender is explored in the literature, the association between gender and the SPMI in the target population remains understudied (Barajas et al., 2015; Li et al., 2016). In addition, the analysis of interactions between this variable and others might be useful for scholar-practitioners in the field. This study also included English language proficiency as a psychosocial variable. I incorporated English language proficiency in this work to investigate the main effects and interaction between psychological comorbidities, age of immigration, and gender among Central Asian immigrants to the United States.

Based on the review of current literature, the researcher determined the statistical model aligned with the research questions and hypotheses. This work investigated the main and interactive effects of psychological and psychosocial factors on the development of psychoticism. Therefore, this research utilized a standard statistical operation of HMR to analyze this relation. The operation of HMR allows the stepwise introduction of variables to the model, whereby illustrating the main effects of variables and interactions between them. This study contributed to the closing of the gap in the knowledge about mental health challenges of the Central Asian immigrant population to the United States.

In the following chapter, I will elaborate on the research design and selection of variables. The methodology of the study will be discussed and the sampling strategy explained. The chapter will conclude with ethical considerations for this research.

Chapter 3: Research Method

The purpose of this research was to analyze whether psychological comorbidities and psychosocial factors are related to psychoticism among Central Asian immigrants to the United States. As established earlier, immigrants are exposed to a number of risk factors detrimental to their mental health when they relocate to other countries, especially when they migrate internationally. Despite the significance of these challenges, the problem of mental health among immigrants is not sufficiently researched, and this work aimed to address the knowledge gap.

In this chapter, I describe (a) the design of the study and rationale in choosing this particular design, (b) the methodology, including sampling, (c) the instruments used in the study, and (d) threats to validity. The chapter will conclude with the review of ethical considerations.

Research Design and Rationale

This work was a quantitative study with six independent variables and one dependent variable. Independent variables of this work included interpersonal sensitivity, obsessive-compulsiveness, hostility, age of immigration, gender of participants, and English language proficiency. This study measured the level of psychoticism as a dependent variable. To answer the research question about the relationship between the variables, I employed a quantitative approach. Different authors offer different definitions of quantitative designs (cf. Apuke, 2017; Kazdin, 2003); however, statistical operations are distinct characteristics of quantitative research design.

The major divide among the types of quantitative designs is the manipulation of variables, which occurs only in experimental/quasi-experimental studies and never occurs in nonexperimental work. In this study, variables were not manipulated; only the main and interactive effects of independent variables on the dependent variable were measured. It is essential to understand that the effect of the relationship between variables has already occurred, making the design ex post facto. The American Psychological Association (2020) defined *ex post facto* research as studies of past occurrences to understand current states. Another characteristic of this study's design is the inferential characteristic; hence the study aimed to analyze predictive powers of independent variables and generalize findings. Finally, in this study, I analyzed the relationship between the variables; therefore, the design of the study was correlational. At this point, the definition of the correlational design had to be contrasted with that of correlational statistics. Correlational statistics employ methods of analyzing relationships between paired variables. Contrary to that, in this work, I analyzed simultaneous interactions between multiple variables using a method of multiple regression.

For this research, I analyzed relationships between psychoticism and contributing factors in the target population of individuals who relocated to the United States between 2010 and 2020. This time constraint aligned with the ex post facto design of this study. The source of data for this work included one published psychometric instrument and patients' interviews. Use of these sources was aligned with the study design because information obtained from these channels was sufficient to answer the research questions.

The method of multiple regression is well suited to answer the research questions for this study. The hypotheses corresponding to the research questions were that the dependent variable may be associated with one of the independent variables when other independent variables are held constant. The option of holding other variables constant is one of the main characteristics of multiple regression analysis (Field, 2013). Quantitative study designs are reputable tools among researchers in the field (Font et al., 2017; Foroughi et al., 2012;) and studies that employ correlational design (e.g., Fugl-Meyer et al., 2002; Giacco et al., 2018; Heeren et al., 2014) are not uncommon in the field. The choice of research design of this work answered the research questions, thus contributing to closing the gap in the literature about interactions between psychological, psychosocial factors, and psychoticism among immigrants.

Methodology

After the collapse of the Soviet Union in the early 1990s, citizens of 15 republics that comprised the Soviet state received opportunities to travel abroad in search of better lives. Five of these republics were located in Central Asia, namely, Kyrgyzstan, Uzbekistan, Kazakhstan, Tajikistan, and Turkmenistan. Individuals who immigrated to the United States from these countries were the target population of this study. According to the Department of Homeland Security (2017), approximately 170,000 individuals traveled from the countries of Central Asia to the United States between 2015 and 2017 on nonimmigrant and immigrant visas. After experiencing opportunities and freedoms the American society could offer, many of these individuals changed the status of their visas; some married, and others filed petitions for political asylums. In addition to those who

received immigrant visas, some individuals did not have such entries at first but obtained pending immigration status, which does not grant lawful residency, however, permits legal status while applications are processed (U.S. Citizenship and Immigration Services, 2021).

By the most conservative estimates, the number of individuals who immigrated from the countries of Central Asia to the United States or adjusted status while in the United States could range from 150,000 to 170,000. This is a significant number that justifies further research. The next section will provide elaboration of sampling procedures. The section will include the selection of sampling strategy and conclude with justification of sample size.

Sampling

Selection of a sampling strategy is a critical component of validity and reliability of research. In paragraphs below, the researcher will elaborate on sampling methods of the proposed study and justification of the sample size.

The theoretical foundation of this study rested on a positivistic paradigm, thus stipulating a quantitative approach. One of the major goals of quantitative research is generalizability. Delice (2010) stated that generalizability aimed to apply findings derived from sample-based research to general populations; therefore, sampling strategies were a paramount part of this research. Landreneau and Creek (2009) defined sampling strategies as plans to ensure that population samples represent populations.

This study employed nonprobability sampling as participants were not randomly ascribed to the sample. Vehovar et al. (2016) identified several nonprobability sampling

methods, including (a) purposive or judgmental sampling, (b) expert selection, (c) case studies, and (d) convenience sampling. For this work, I employed purposeful sampling. Vehovar et al. defined purposive sampling as the selection of participants with a particular characteristic that interests researchers. In this study, I analyzed relationships between psychoticism, psychological, and psychosocial factors. Therefore, the sampling strategy included adult individuals who immigrated from Central Asia to the United States within the past 10 years and were diagnosed with psychological disorders, chronic or transient. Implementation of a purposive sampling method has its strengths and weaknesses.

Sampling Procedures

The rationale for the selection of the sampling strategy must be aligned with the purpose and aim of the research. Punch (2004) stated that the sampling strategy had to be integrated into the overall logic of any study and continue ontological and epistemological perspectives of research. In this work, I analyzed relationships between particular mental health traits within the particular population; therefore, the selected participants needed to share information appropriate and useful to the study.

Given the relatively small number of purposely selected participants used in this research, the main target of the sampling strategy was to concentrate on the depth, not the breadth, of the problem (Palinkas et al., 2015). Therefore, the main strength of the purposive methods is the detailed exploration of the target population, which contributes to the increase in internal validity and reliability. Heale and Twycross (2015) defined reliability as the consistency of measures within the sample. This study utilized the same

instruments within the same pool of participants. Another strength of the sampling strategy of this work was that purposive sampling contributes to the increased internal validity because focusing on the particular group and utilization of specific instruments simplifies control measures against threats to validity (Morse & Graves, 2009). The purposive method is also the cost-effective and time-effective implementation of the method. In this research, the pool of participants was selected from the population of Central Asian immigrants seeking psychological help.

Despite its strengths, the purposive method has limitations. As discussed above, the purposive sample concentrates on a sample of the specific population; therefore, implementation of this method determines low generalizability because the findings of the study may not be applicable to other groups. Another limitation of the purposive method is the vulnerability of such studies to researcher bias, errors, and misstatements. To minimize these threats, I created two lists of participants: a hard copy and a digital copy to use for cross-reference. In addition, during the data collection, random quality control assessments were conducted on several occasions (e.g., comparisons of the accuracy of data of randomly selected participants in the digital and hard copies of the dataset). In this study, all participants were assigned numerical codes to assure the safety of private information and reduce researcher bias. Numerical codes were aligned with alphabetical order of participant cases.

This work utilized the purposive sampling strategy; thus, I used my own judgment to select participants for the study. The selection procedure began with the identification of the unit of analysis. The U.S. General Accounting Office (1992) stated that the unit of

analysis was an entity that researchers would like to explore and inform others about. This study aimed to analyze individuals' experiences; therefore, the unit of analysis was an individual person. The next step in the sampling procedure was establishing inclusion and exclusion criteria. The following individuals were included in this study: (a) adults, ages between 18 and 85, (b) individuals who immigrated to the United States, and (c) individuals of Kazakh, Kyrgyz, Uzbek, Tadjik, and Turkmen ethnicity. Criteria that qualified an exclusion from the participation pool was the presentation of an acute psychotic state or other disorders demonstrable in the detachment from reality.

Sample Size Calculation

Determination of sample size is a process of identifying a number of participants sufficient for producing accurate results of statistical operations. Accurate inferences are the essential components of generalizability and external validity. To determine the appropriate sample size, several aspects of statistical analysis are needed for consideration: (a) effect size, (b) alpha level, and (c) power level. Effect size is the measure of the difference between two groups or differences in variations between variables. While implementing sampling strategies, it is critical to contrast families of statistical tests when determining effect sizes (e.g., *t* tests vs. linear regressions).

In multiple regressions, the effect size is measured as a proportion of variance between predictors (Field, 2013). According to Cohen (1988), $f^2 = .02$ represents a small effect, $f^2 = .15$ represent a medium effect, and $f^2 = .35$ represent a large effect in multiple regression. At that stage, the study projected effect size $f^2 = .3$. The alpha level, also known as the significance level, is the probability of rejecting the null hypothesis when it

is true. Traditionally, the alpha level is accepted at $\alpha = .05$, which constitutes just a 5% chance of rejecting a true hypothesis and making a Type I error. While the alpha level pertains to the Type I error, the power level is relevant to the Type 2 error, failure to reject a false null hypothesis. In social sciences, the power level is traditionally accepted at $(1-\beta) = .8$, which signifies an 80% chance of detecting statistically significant findings. Using the sample size software G*Power (Faul et al., 2009), the calculation produced an estimated sample size of $n = 53$. According to the G*Power software, this number of participants is a minimal pool of participants that would satisfy values of requested effect, power, and significance parameters.

The result of the estimation of the population sample is consistent and comparable with literature investigating aspects of mental health among immigrants. Lai (2011) utilized a sample size of 151 for the method of multiple regression, Fornazzari et al. (2009) used a pool of 125 participants, Todd et al. (2011) utilized a sample size of 103 participants for logistic regression, and Gatt et al. (2019) used a pool of 194 participants for the univariate ANOVA and chi-square analyses. Finally, Cohen (1992) provided estimations of sample size in his seminal work on quantitative methods in psychology. With given $\alpha = .05$, medium effect size, and the method of the statistical test as multiple regression with six independent variables, the estimated population sample $n = 97$.

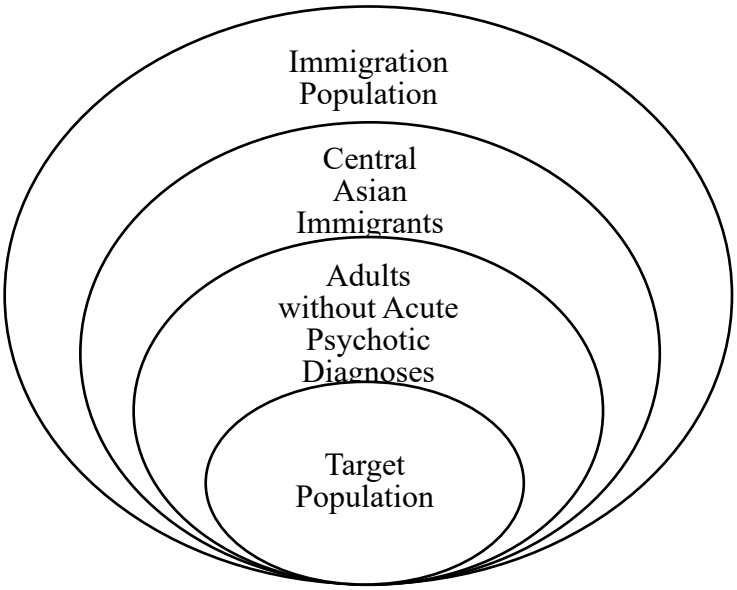
As the above shows, the estimated sample size may vary from 53 to 97 participants, according to recommendations of different sources. I aimed for a number of participants comparable with theoretical estimates, calculations, and studies relevant to this work.

Archival Data

Archival data were used for the analysis of this study. Participants were selected based on demographic information (see Figure 4)

Figure 4

Selection of the Participants



Note: From the immigrant population in Brooklyn, New York, adult individuals of Central Asian origin, who did not have acute psychotic conditions, were selected to participate in the study.

Data were assessed after the data provider gave permission to access hard copies of case files and corresponding electronic data (see Appendix A). The access was given to me while on the premises of the outpatient practice. Individuals whose information was included in this study did not express objections if their answers were to be used in future studies when they signed informed consent. No historical data or legal documents were used in this research.

Instrumentation and Operationalization of Constructs

This work utilized the SA-45 Questionnaire (Strategic Advantage, 1996) to assess psychoticism, interpersonal sensitivity, hostility, and obsessive compulsiveness. The instrument was published in 1996 by Strategic Advantage, Inc. under exclusive license to Multi-Health Systems, Inc. The utilization of the SA-45 is aligned with the goals of the study because the instrument assesses aspects of mental health illnesses that the study aimed to investigate. Secondly, the SA-45 was developed to accommodate the need for general psychiatric symptomatology. Strategic Advantage (1996) stated that the instrument could "be used for broad symptoms screening in psychiatric and nonpsychiatric settings" (p. 1). The instrument was developed for the general adult and adolescent population, provided normative group-specific data for both genders, and appropriate for inpatient and outpatient settings (Strategic Advantage, 1996). The authors stated that the SA-45 typically takes approximately 10 minutes to administer. The administration of the test does not require any specific tools; however, interpreting the results requires compliance with "the Standards for Educational and Psychological Testing (Strategic Advantage, 1996, p. 1). The preprinted form containing 45 questions is given to a patient; upon the completion of the form, columns corresponding to particular symptom domains are summed to calculate the Global Severity Index and Positive Symptoms Total scores. Scores are calculated separately for adult males, adolescent males, adult females, and adolescent females. The SA-45 could be administered in the paper-and-pencil QuickScore or computerized format a PsychManager Lite (Strategic Advantage, 1996).

Reliability and Validity of the SA-45

The instrument of choice for the proposed study is a norm-based psychological assessment. The SA-45 establishes a comparison between the psychological score of participants in the proposed study and average scores derived from the normative base. Strategic Advantage (1996) stated that the adult population involved in the development of the test consisted of 5,317 females and 5,854 males. The large population sample is essential to the establishment of critical psychometric parameters: reliability and validity. McLeod (2013) stated that reliability of psychological tests referred to the consistency of such tests. It is measured by calculating Cronbach's coefficient α between different published tests that measure similar characteristics. Cronbach's α is a measure of internal consistency and correlation between groups (Institute for Digital Research & Education, 2021).

The SA-45 was compared with similar tests, namely, the Brief Symptom Inventory (BSI; Derogatis, 1975) and the Symptom Checklist-90 (SCL-90; Derogatis et al., 1973). All three instruments were developed to identify self-reported clinically significant psychological symptoms in the general population and intend to measure similar constructs. See below correlations between target domains derived from the SA-45, BSI, and SCL-90 in the adult non-patient population.

Table 1

Cronbach α Coefficients for SA-45, BSI, and SCL-90 Scales for the Nonpatient Population Sample

Domain	SA-45	BSI	SCL-90
Hostility	.85	.77	.81
Interpersonal sensitivity	.85	.80	.86
Obsessive compulsiveness	.81	.81	.84

Note: The sample size is *n* = 1,077 – 1,085. The SA-45 coefficients adapted from "Development of a brief, multidimensional, self-report instrument for treatment outcomes assessment in psychiatric settings: Preliminary findings," by M. Davidson, B. Bershadsky, J. Bieber, D. Silversmith, M. Mariush, and R. Kane, 1997, *Assessment, 4*(3), 259–276. https://doi.org/10.1177/107319119700400306. Copyright 1997 Sage Publications.

Davidson et al. (1993) stated that the reliability of the SA-45 was supported by cluster analysis and recommended SA-45 for clinical settings. Taber (2016) defined the values of Cronbach's α as high if α = .73 -.95, which is applicable to the findings of Davidson et al. (1997).

In contrast to externally oriented reliability, validity of an instrument is concerned with measuring ability what the instrument was developed to measure (Anastasi, 1988). In order to determine validity of the SA-45, product-moment correlations were calculated between domains of this instrument and compared to the values of correlations in other reputable tools similar to the instrument of interest.

Table 2

SA-45, BSI, and SCL-90 Interscale Correlation Matrix for an Adult Population Sample

Domain	Hostility	Interpersonal sensitivity	Obsessive compulsiveness
Hostility			
	n/a	.52	.46
		.56	**.55****
		.61**	*.56***
Interpersonal sensitivity	n/a	n/a	.71
			.70
			.75**

Note. Sample size n = 773; values marked ** are significantly different from SA-45, $p <$ .01. From top to bottom, the correlations presented as those between SA-45 scales in the standard typeface, those between BSI are bold, and those between SCL-90 are in italics. Adapted from *The Symptoms Assessemnt-45 Questionnaire,* by Strategic Advantage, 1996, Multi-Health System, Inc. Copyright 1996 by Strategic Advantage.

Strengths of associations of product-moment correlations are summarized as weak correlation from .1 to .3, medium from .3 to .5, and large, .5 to 1.0 (Cohen, 1988). Correlations within instruments are predominantly large (refer to Table 2).

Reliability and validity of the SA-45 were established through various studies and methods (Strategic Advantage, 1996). The instrument demonstrated acceptable psychometric parameters and has been a reliable psychological tool for decades.

The SA-45 provided this study with values of four variables: (a) psychoticism, (b) interpersonal sensitivity, (c) hostility, and (d) obsessive compulsiveness. This work did not use any additional published instruments as the rest of participants' information (i.e., gender, language proficiency, and age of immigrating) were derived from interviews.

Data Analysis Plan

The first phase of the data analysis was to create the dataset. Upon collection of eligible cases, the researcher populated data sheets in SPSS. Continuous and categorial variables were given appropriate icons to assure accuracy of statistical calculations. After the dataset was complete, the researcher produced descriptive SPSS outputs in order to describe the sample. The final phase of the data analysis was to conduct multiple regressions to investigate possible associations between variables. Based on the findings of multiple regressions, mediation analysis was conducted to further explore relationships between variables of interpersonal sensitivity and obsessive compulsiveness.

Ethical Procedures

American Psychological Association recognizes the importance of maintaining privacy and confidentiality while conducting research projects. Thus, the ethical code of APA stated that psychologists had an obligation to maintain to protect the private information of their patients (APA, 2021). In addition to guidelines of APA, the Code of Federal Regulations 45 CFR, Part 46 provides the legislative basis for the protection of human subjects during the research (Office for Human Research Protection, n.d.). In compliance with the above, the agreement between the researcher and data owner was negotiated to maintain the privacy and confidentiality of participants, according to Health Insurance Portability and Accountability Act (HIPAA) regulations.

Data provider permitted the researcher to access information that was essential to this study, such as psychological and psychosocial information derived from interviews and self-reports. The data set was kept strictly confidential, personal identifiable

information of participants was not to be published, third-parties or subcontractors were prohibited from accessing the dataset. The data provider permitted access to participants' information only on premises of the practice in the form of hard copies of files and electronic records. The researcher was prohibited from contacting participants of the study in any form of communication and dissemination of information. Since participants' data were collected during psychological interviews and assessments in the past, there is no personal contacts between participants and the researcher, there is no conflict of interest, or occurrence of imbalance of power.

Summary of the Chapter

This chapter provides readers with research design and rationale for the selection of a particular methodology. The methodology included sampling strategy and justification of the sampling procedures as a critical measure to assure the accuracy and generalizability of this study. The psychological instrument SA-45 (Strategic Advantage, 1996), which was used in this work, was described, including discussions of reliability and validity. The chapter addressed ethical concerns of the safety of personal information and measures to assure protection of participants privacy according to Codes of Federal Regulations and APA guidelines.

The next chapter will provide reports of statistical operations and findings, beginning with the description of the purpose of the proposed study, hypotheses, and research questions. Descriptive statistics will then inform readers about the characteristics of the sample. The chapter will continue with the inferential analysis of data, including

assumptions pertinent to particular statistical operations. The chapter will conclude with the analysis of findings.

Chapter 4: Results

This research aimed to investigate associations between psychological conditions, psychosocial characteristics, and psychoticism among immigrants from Central Asia. In this study, I sought to answer the following research questions and test the corresponding hypotheses:

RQ_1: To what extent does interpersonal sensitivity predict psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant?

H_{01}: Interpersonal sensitivity is not a statistically significant predictor of psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A1}: Interpersonal sensitivity is a statistically significant predictor of psychoticism when hostility, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

RQ_2: To what extent does hostility predict psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency, are held constant?

H_{02}: Hostility is not a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A2}: Hostility is a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

RQ_3: To what extend does obsessive-compulsiveness predict psychoticism when interpersonal sensitivity, hostility, gender, age of immigration, and English language proficiency are held constant?

H_{03}: Obsessive-compulsiveness is not a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

H_{A3}: Obsessive-compulsiveness is a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

RQ_4: To what extent does gender predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant?

H_{04}: Gender is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant.

H_{A4}: Gender is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant.

RQ_5: To what extent does age of immigration predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, mental health history, and English language proficiency are held constant?

H_{05}: Age of immigration is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and English language proficiency are held constant.

H_{A5}: Age of immigration is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and English language proficiency are held constant.

RQ_6: To what extent does English language proficiency predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant?

H_{06}: English language proficiency is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant.

H_{A6}: English language proficiency is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant.

In this chapter, I explain how data were collected and provide descriptive statistics, while informing readers of demographic characteristics of the sample. In addition, the representativeness of the sample and external validity of nonprobability sampling will be revisited. The chapter continues with a description of statistical

operations used in this work, including assumptions of the selected methods. The chapter concludes with the results of statistical inquiry supported by data exported from SPSS outputs.

Data Collection

Data were extracted from individual cases of immigrants from countries of Central Asia who relocated to the United States from 2010 to 2020. The allocated period for the data collection was set at 2 months, from the beginning of April to the end of May 2021. This research used archival data; therefore, there was no need to recruit participants. I determined the eligibility of participants' cases based on inclusion criteria of ethnicity and mental health conditions.

Baseline Demographics

The sample included immigrants of Central Asian descent who relocated to the United States within the past 10 years. Average age of the sample is 35.96 years old ($S\,D$ = 11.24). The population was comprised of male immigrants (n_m = 92 or 47.2%) and female immigrants (n_f = 103 or 52.8%). Religious affiliations of the sample demonstrated a greater variability. The number of Christians sampled was 11 (16.18%), the number of Muslims sampled was 49 (72.06%), including practicing Muslims (n_{mp} = 35 or 51.47%) and nonpracticing Muslims (n_{nm} = 14 or 20.59%), and eight of those individuals (or 11.76%) reported no religious affiliations. The population sample demonstrated that 77.5% had a graduate degree or some college education (n_{col} = 150), high school graduates accounted for n_{hs} = 34 or 17.6%, whereas less than high school education accounted for n_{dr} = 5 or 2.6%. Marital status varied between married (including married

but separated) at 74.9% of the sample (n_{mar} = 146) and not married (including divorced) at 23.6% (n_{div} = 46).

The target population of this research was individuals who immigrated from the countries of Central Asia to the United States. The current literature offers limited information on the corresponding parameters between the sample and the population. Due to lack of information about the particular Central Asian population, data were collected about immigrants to the United States from Asia in general and psychosocial information about the nonimmigrant population in Central Asia. The average age of Asian immigrants to the United States is $\mu = 46$ (Migration Policy Institute, 2021), whereas the mean age of the population sample used in the study is $\mu_s = 35.96$. According to the Migration Policy Institute (2021), 54% of adult immigrants from Asian countries obtained a bachelor's degree or higher and the Pew Research Center, (2018) stated that 17.3% had some college education. The population sample used in this research reported 50.26% of some college and 27% of graduate degrees. The marital status of Asian immigrants comprised of 65% married individuals (National Healthy Marriage and Resource Center, n.d.) in comparison to 74.9% of married individuals in the population sample. According to the World Bank data (World Bank, 2018), 52.4% of Asian immigrants were female, whereas, in the population sample used in this work, the gender composition was comparable to the above with 52.8 % female and 47.2% male individuals.

Finally, religious affiliations of the Central Asian population comprised of Muslims (65% in Kyrgyzstan, 76% in Uzbekistan, 84% in Tajikistan, 88% in Turkmenistan, and 50% in

Kazakhstan, μ_{rm} = 72.6%), Orthodox Christian (14% in Kazakhstan, 6% in Kyrgyzstan, other countries less than 2%, with μ_{rc} = 5.2%), and 22.2% comprised of individuals with other religious affiliations (atheist, Buddhist, non-practicing Christians, and others), according to the National Council for Eurasian and East European Research (NCEER, 2008). The population sample used in this study demonstrated the following dispersion of religious affiliations: 72.06% of participants were Muslims, 16.18% were of Christian faith, and 11.76% reported other affiliations.

Table 3

Comparison of Religious Affiliations in the Native Population and Population Sample

	Muslim %	Christian %	Other %
Central Asian population	72.6	5.2	22.2
Sample population	72.06	16.18	11.76

Note. The native population data adapted from *Religious Affiliations and Family Formation in post-Soviet Central Asia*, by K. Anderson and C. Becker, The National Council for Eurasian and East European Research [NCEER], 2008, https://www.ucis.pitt.edu/nceeer/2008_821-04_Anderson.pdf.

The corresponding sample population data was obtained from the archival data, according to the Data Provider Agreement.

The present study utilized the purposive sampling strategy; therefore, the characteristics of the target population and the sample population are expected to be similar, but not necessarily congruent. In addition, there is a scarcity of data on the target population in academia and outside of the research community. The comparison above

aimed to illustrate discrepancies that may be useful to this and other studies. For example, the number of individuals of Christian faith in the native population is significantly lower than in the sample size. This can be possibly explained by the fact that many Christians have encountered unfair conditions due to religion-based prejudice in their home countries and seek new opportunities by immigrating to the United States. The nonprobability purposive sampling strategy used in this research does not eliminate the usefulness of the findings to other studies, although generalizability is limited.

Results

Descriptive Characteristics of the Population Sample

The purpose of this research was to analyze relationships between the dependent variable of psychoticism and independent variables interpersonal sensitivity, hostility, obsessive compulsiveness, gender, English language proficiency, and age of immigration. In order to investigate this relationship, a population sample was selected $n = 195$, number of males $n_m = 92$, females $n_f = 103$, average age $\mu = 35.96$ ($SD = 11.24$). The population sample demonstrated high variability in the educational level IQV = .80 (see Table 4). According to Peck (n.d.), variability of categorical variables ranged from 0 (no variability) to 1 (maximum variability).

Table 4

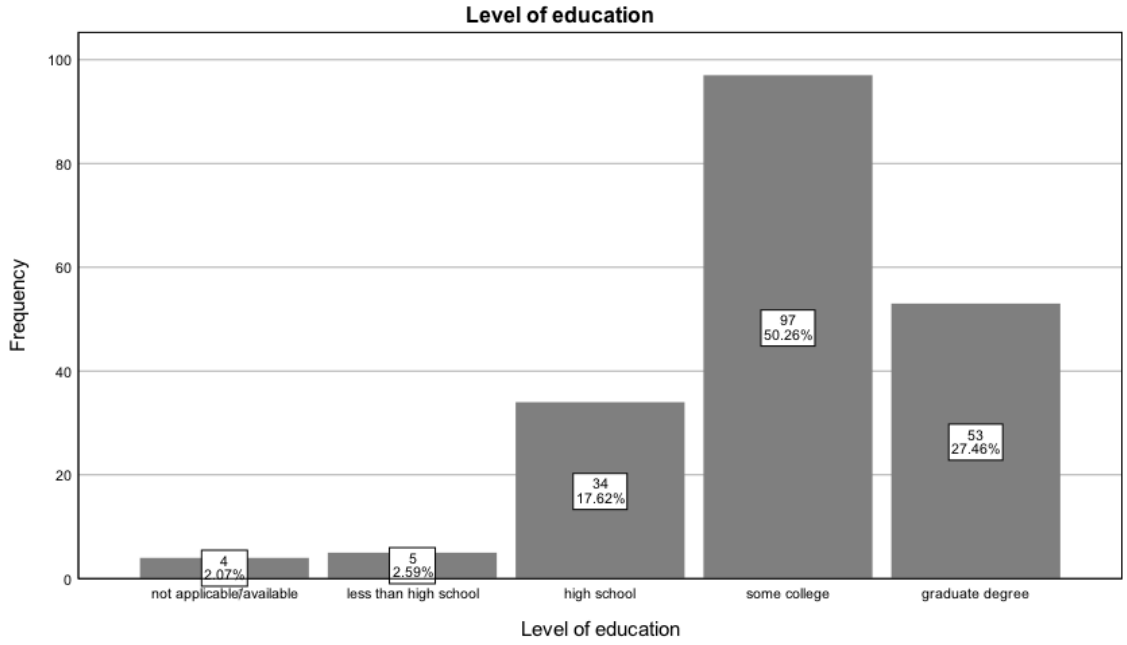
Level of Education

		Frequency	Percent	Valid percent	Cumulative percent
Valid	not applicable	4	2.1	2.1	2.1
	less than high school	5	2.6	2.6	4.7
	high school	34	17.4	17.6	22.3
	some college	97	49.7	50.3	72.5
	graduate degree	53	27.2	27.5	100.0
	Total	193	99.0	100.0	
Missing	System	2	1.0		
Total		195	100.0		

Note. The data were exported from SPSS. Rounding of decimal caused the total in valid percent column to exceed 100%.

Figure 5

Education Level of the Sample Population



Note. The discrepancy between values in the table and in the graph are secondary to automated rounding performed by SPSS.

Table 5

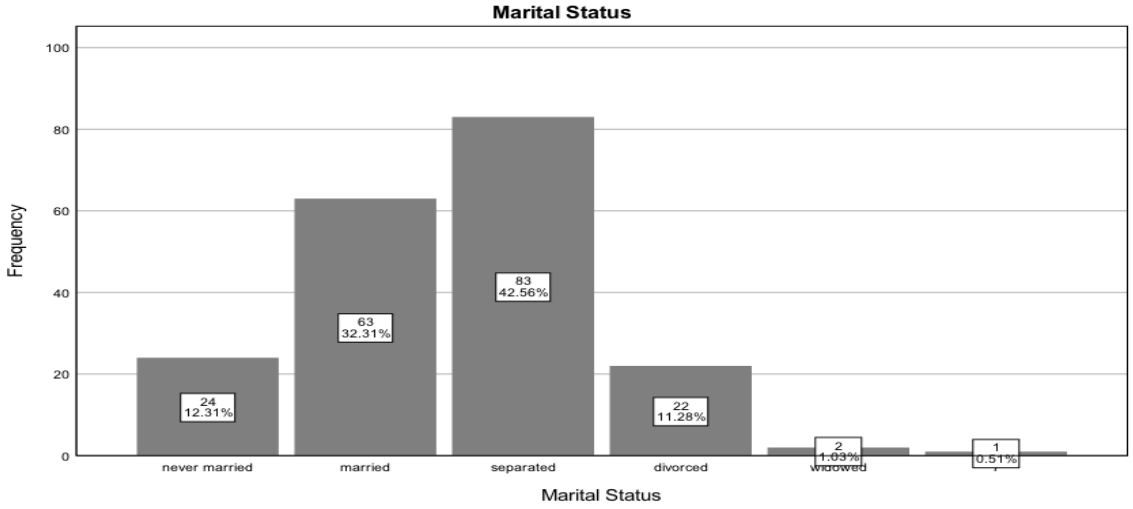
Marital Status of the Population Sample

		Frequency	Percent	Valid percent	Cumulative percent
Valid	never married	24	12.3	12.3	12.3
	married	63	32.3	32.3	44.6
	separated	83	42.6	42.6	87.2
	divorced	22	11.3	11.3	98.5
	widowed	2	1.0	1.0	99.5
	other	1	.5	.5	100.0
	Total	195	100.0	100.0	

Note. The data were exported from SPSS.

Figure 6

Marital Status of the Population Sample



Note. The data were exported from SPSS.

The population demonstrated a high variability in marital status as well with IQV_M = .82.

Age of participants is another important demographic characteristic. However, the level of measurement is continuous, therefore, descriptive statistics included central tendencies instead of variability.

Table 6

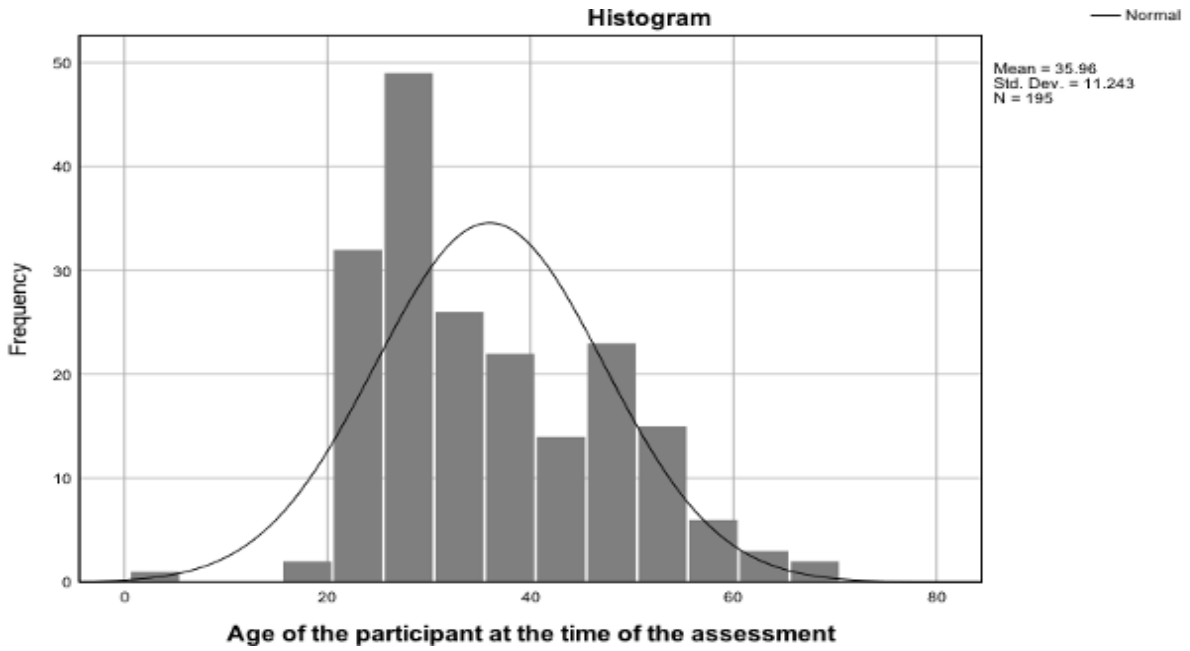
Central Tendencies of Age of the Population Sample

N	Mean	Median	Mode	Standard Deviation
195	35.96	32.00	28	11.24

Note. The data were exported from SPSS.

Figure 7

Participant Age at Time of Assessment



Note. The data were exported from SPSS.

Table 7

Religious Affiliations of Participants

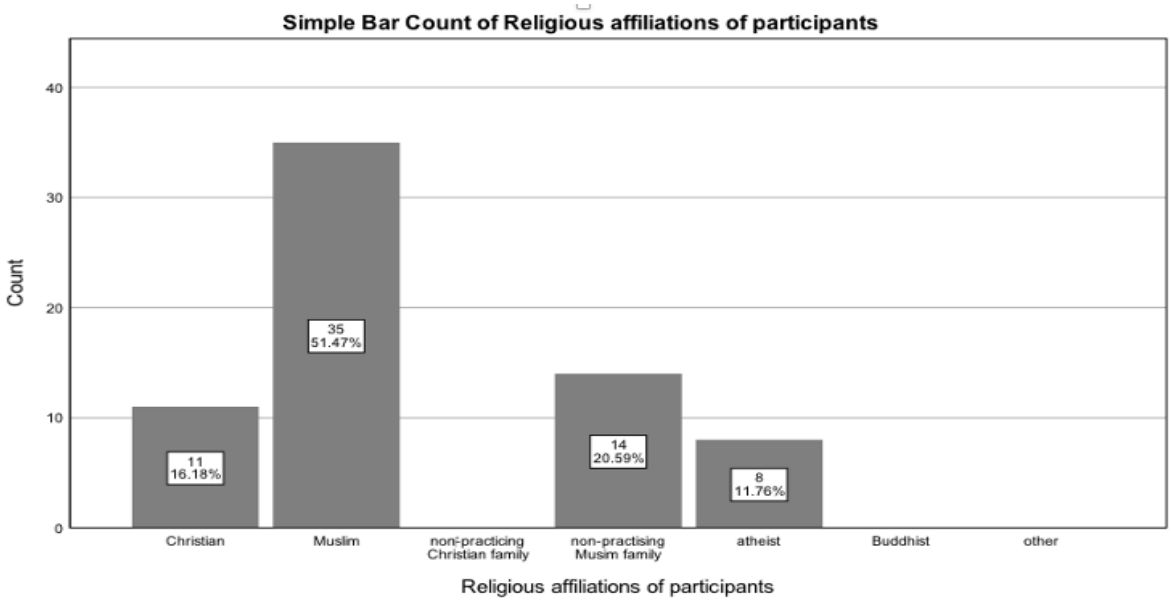
		Frequency	%	Valid %	Cumulative %
Valid	Christians	11	5.6	16.2	16.2
	Muslims (practicing and not practicing)	35	17.9	72.1	72.1
	Others (atheists, buddhists, no affiliation, etc.)	8	4.1	11.8	100.0
	Total	68	34.9	100.0	
Missing	not applicable	116	59.5		
	System	11	5.6		
	Total	127	65.1		
Total		195	100.0		

Note. The data were exported from SPSS. Rounding of decimal caused the total in valid percent column to exceed 100%.

Analysis of descriptive statistical data on religious affiliation returned a low variability index IQV = .22.

Figure 8

Religious Affiliations of Participants



The population sample is n = 195, with high levels of variability in gender, educational level, marital status, but not religious affiliations. The average age of the population sample was comparable with the typical age of immigrants from other countries. Although, not all of these parameters were used as psychosocial variables in the statistical analyses. The explanation of included variables, statistical operations, and statistical assumptions are provided in the following subchapter.

Statistical Assumptions

In this work, linear and hierarchical multiple regressions were the main statistical operations. I used this operation because it answered the research questions about relationships between the dependent variable and independent variables. Hierarchical multiple regressions differ from traditional multiple regressions in the number of linear regression blocks introduced to the model. Traditional multiple regression introduces all

independent variables into the model at the same time, whereas hierarchical multiple regression creates several nested levels by stepwise introduction of independent variables (Walden University Academic Skills Center, 2019). Departure from the traditional model offered the benefits of observing interactions between variables and analysis of possible partial or full mediation. Similar to general linear models, hierarchical multiple regressions, however, are subjects to several statistical quality control measures, also known as assumptions. Laerd Statistics (n.d.) stated that multiple regressions needed to meet eight assumptions to produce valid results. These assumptions are (a) level of measurement of the dependent variable, (b) level of measurements of the independent variables, (c) independence of observations, (d) linearity of relationships between dependent and independent variables, (e) homoscedasticity of variance, (f) limits of multicollinearity, (g) influential outliers, and (h) approximate normality of distribution.

According to Laerd Statistics (n.d.), the dependent variable had to be measured on a continuous level. The dependent variable in this study is the level of psychoticism, and it is a continuous variable. The second assumption stipulated that dependent variables were continuous and categorical. In this research, independent continuous variables are interpersonal sensitivity, hostility, obsessive compulsiveness, and age of immigration. The rest of the independent variables, namely, gender and English language proficiency, are categorical. The third assumption is the independence of observations. This assumption can be investigated by using the Durbin-Watson statistic. Kenton (2021) stated that the value of Durbin-Watson statistic could vary between zero and four, however, the value between 1.5 and 2.5 considered to be normal.

Table 8

Durbin-Watson Coefficient for the Full Model

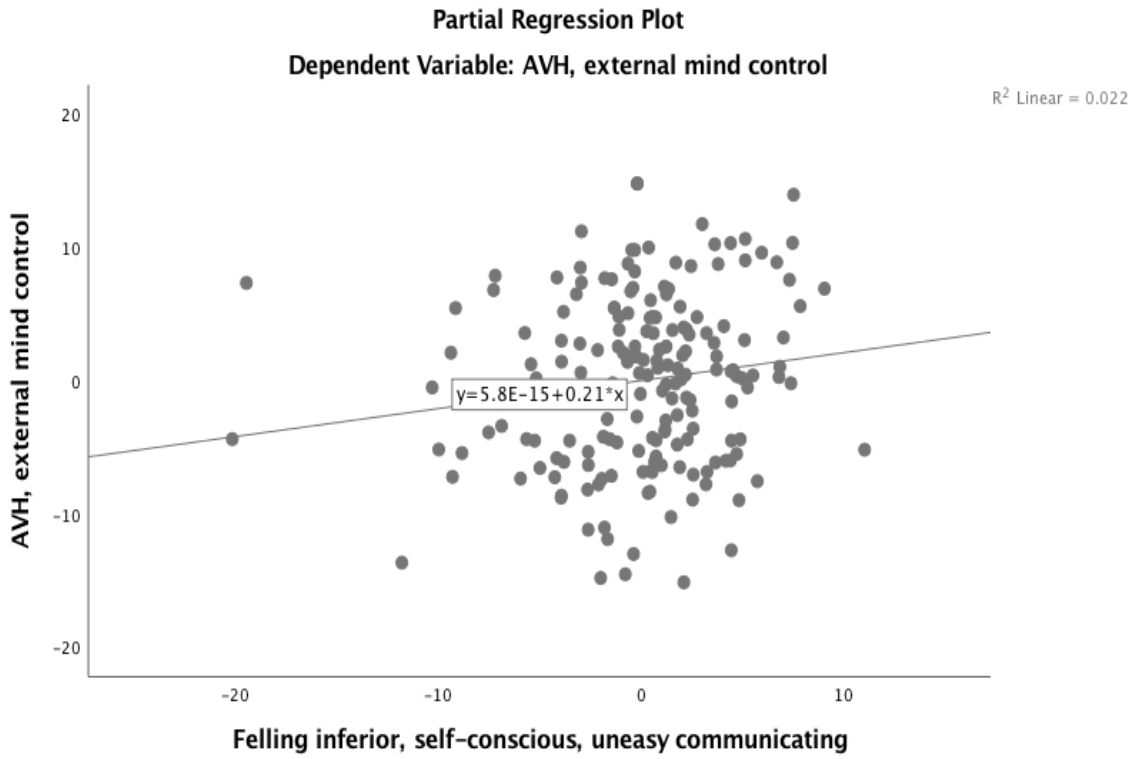
	Change statistics	
Model	Sig. *F* change	Durbin-Watson
1	.000	
2	.005	
3	.001	
4	.014	
5	.972	
6	.001	1.974

Note. The data were exported form SPSS. The values of the Durbin -Watson coefficient calculated for the full model with six independent variables.

The assumption of the independence of observation is fulfilled. The next assumption is the linearity of relationships between the dependent variable and each of the independent variables. Field (2013) stated that the outcome variable should be linearly related to any predictor variables; otherwise, the model would be invalid. The linearity of the relationship can be investigated by using scatterplots with predictors placed on the X-axis (independent variable) and residuals on the Y-axis (dependent variable).

Figure 9

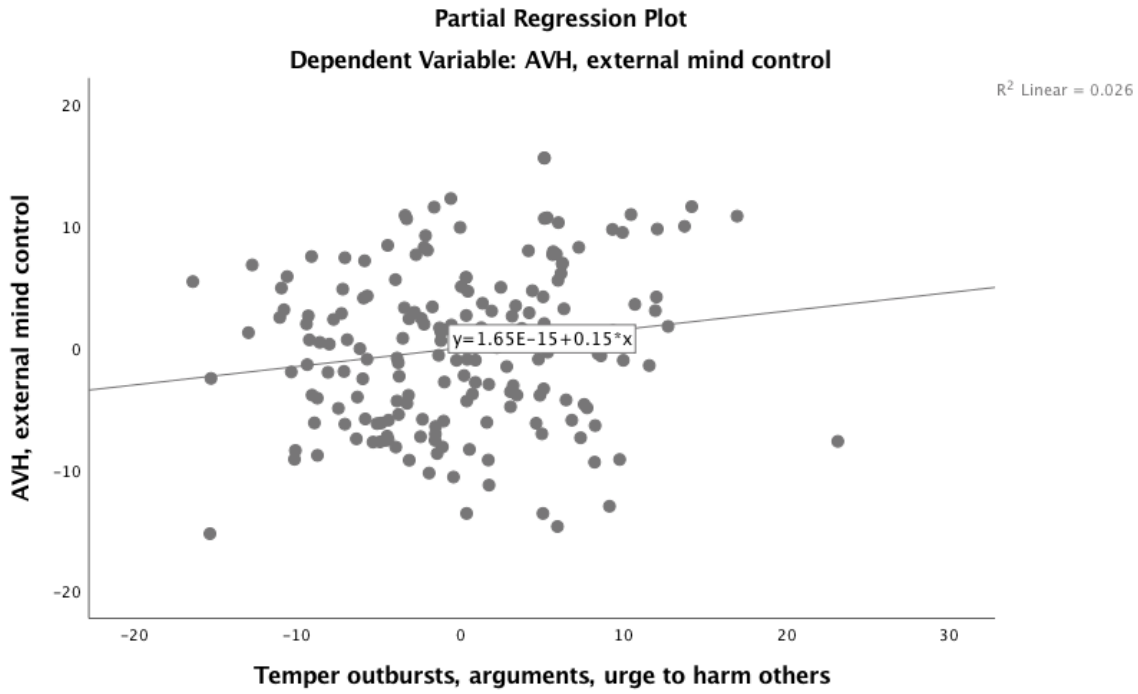
Linearity Between Psychoticism (AVH, External Mind Control) and Interpersonal Sensitivity



Note. The imposed fit line confirmed the linearity of relationships between psychoticism and interpersonal sensitivity.

Figure 10

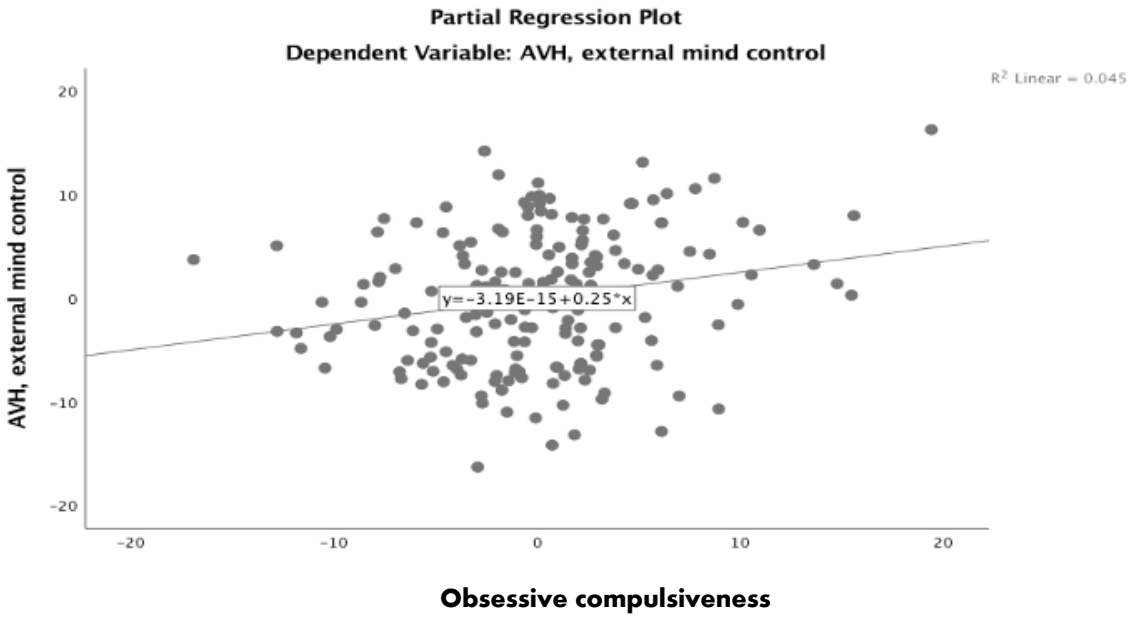
Linearity Between Psychoticism (AVH, External Mind Control) and Hostility



Note. The imposed fit line confirmed the linearity of relationships between psychoticism and hostility.

Figure 11

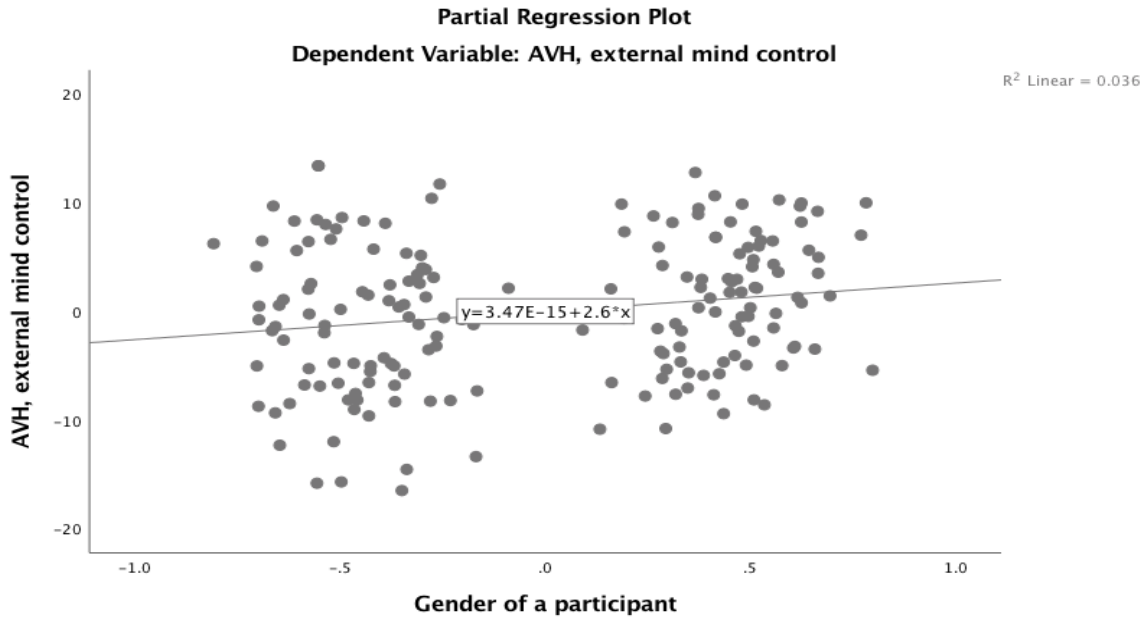
Linearity Between Psychoticism (AVH, External Mind Control) and Obsessive Compulsiveness



Note. The imposed fit line confirmed the linearity of relationships between psychoticism and obsessive compulsiveness.

Figure 12

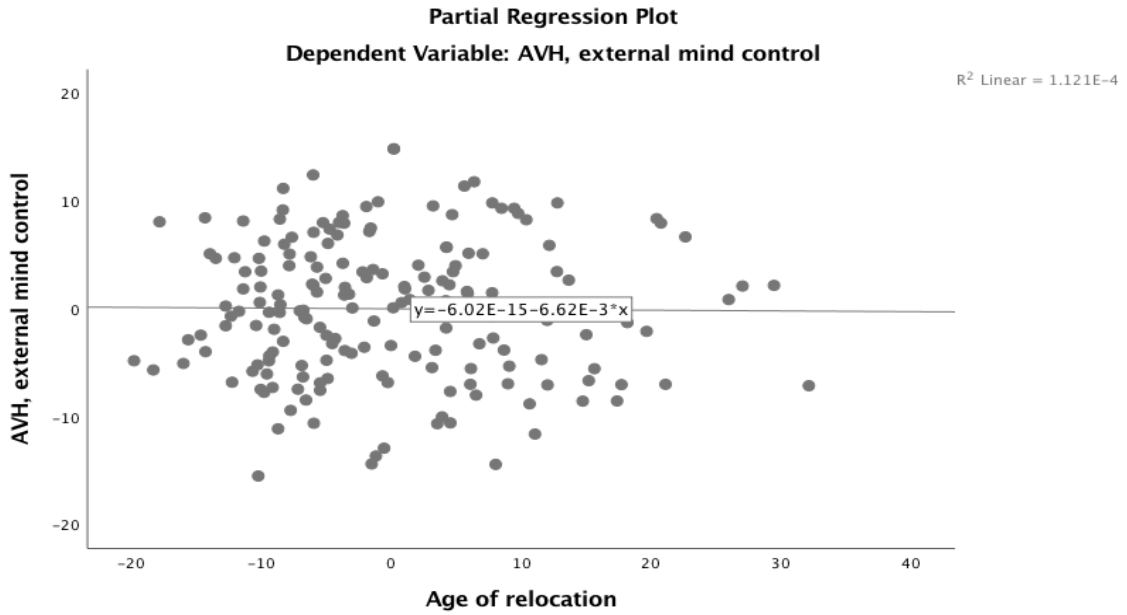
Linearity Between Psychoticism (AVH, External Mind Control) and Gender



Note. The imposed fit line confirmed the linearity of relationships between psychoticism and gender. The two groupings on the scatter plot indicate that the independent variable, gender of participant, is binomial.

Figure 13

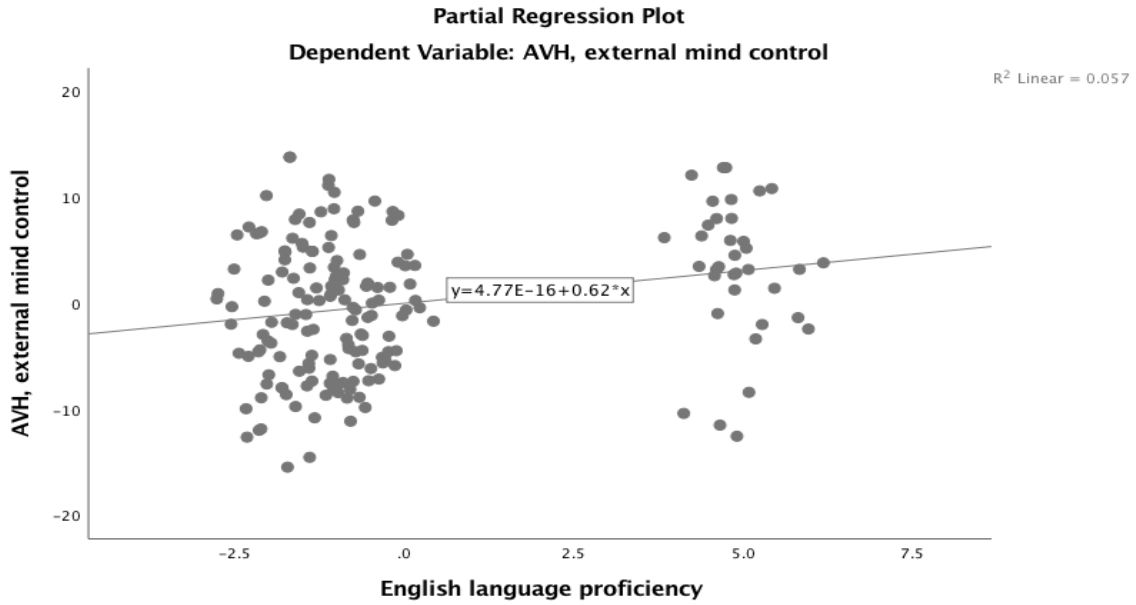
Linearity Between Psychoticism (AVH, External Mind Control) and Age of Relocation



Note. The imposed fit line confirmed the linearity of relationships between psychoticism and age of relocation.

Figure 14

Linearity Between Psychoticism (AVH, External Mind Control) and English Language Proficiency



Note. The imposed fit line confirmed the linearity of relationships between psychoticism and English language proficiency. The two groupings on the scatter plot indicate that the independent variable, English language proficiency, is binomial.

The assumption of linearity was met for the model.

The next assumption was the test of homoscedasticity or equality of variance. Field (2013) stated that homoscedasticity assumed that the variance of the residuals of the predictor variables should be constant on each level. One-way ANOVA was conducted between psychoticism as the dependent variable and gender as a predictor variable. The one-way ANOVA demonstrated statistically insignificant Levine's test, F (2, 189) = 1.25, p = .29, which indicated no difference in variance of the residuals of the dependent variable across the level of the predictor variable.

Table 9

Test of Homogeneity of Variances

		Levene Statistic	df_1	df_2	p
AVH, external mind control	Based on Mean	1.245	2	189	.290
	Based on Median	.933	2	189	.395
	Based on Median and with adjusted df	.933	2	178.577	.395
	Based on trimmed mean	1.257	2	189	.287

Note. The values of Levene's statistics was rounded to the second digit.

The one-way ANOVA was conducted to analyze the homoscedasticity of variance in the relationships between psychoticism and gender. The one-way ANOVA demonstrated statistically insignificant Levene's test with F (1, 193) = 3.68, p = .57, which indicated no difference in variance of the residuals of the dependent variable across the level of the predictor variable.

The next assumption was the assumption of multicollinearity. The test of multicollinearity investigates if the model has a highly correlated variable, thus, measuring the same constructs. The assumption of multicollinearity was inspected in the SPSS using the variance inflation factor (VIF). Field (2013) stated that VIF > 10 indicated causes for concerns, while VIF substantially greater than one could indicate biased regression. On the other side, VIF should not be smaller than .1 (Field, 2013).

Table 10

Variance Inflation Factor of Each Variable in the Final Model of the Regression

	Interpersonal sensitivity	Temper outbursts	Obsessive compulsiveness	Gender of participants	Age of relocation	English proficiency
VIF	1.97	1.31	1.83	1.14	1.09	1.05

Note. VIF values were exported form SPSS output and were rounded to the second decimal digit.

The model meets the assumption of multicollinearity.

The next assumption is significant outliers. This particular assumption investigates unusual cases that may skew the normality of the model using the Cook's distance parameter. Field (2013) stated that identifying the presence of significant outliers could "help to determine whether the regression model is stable across the sample" (p. 306). The author indicated that Cook's distance values greater that one could be matters of concern. The model presented in this work returned the values of Cook's distance in the range between zero and .085.

The model meets the assumption of outliers. The final assumption is the assumption of normality of distribution of data. There several methods of investigating the normality of distribution. This work included the Normal P-P plots, superimposed bell curve on histograms of variables, and Shapiro-Wilks parameters.

Table 11

Shapiro-Wilks Values of Normality for the Variables in the Model

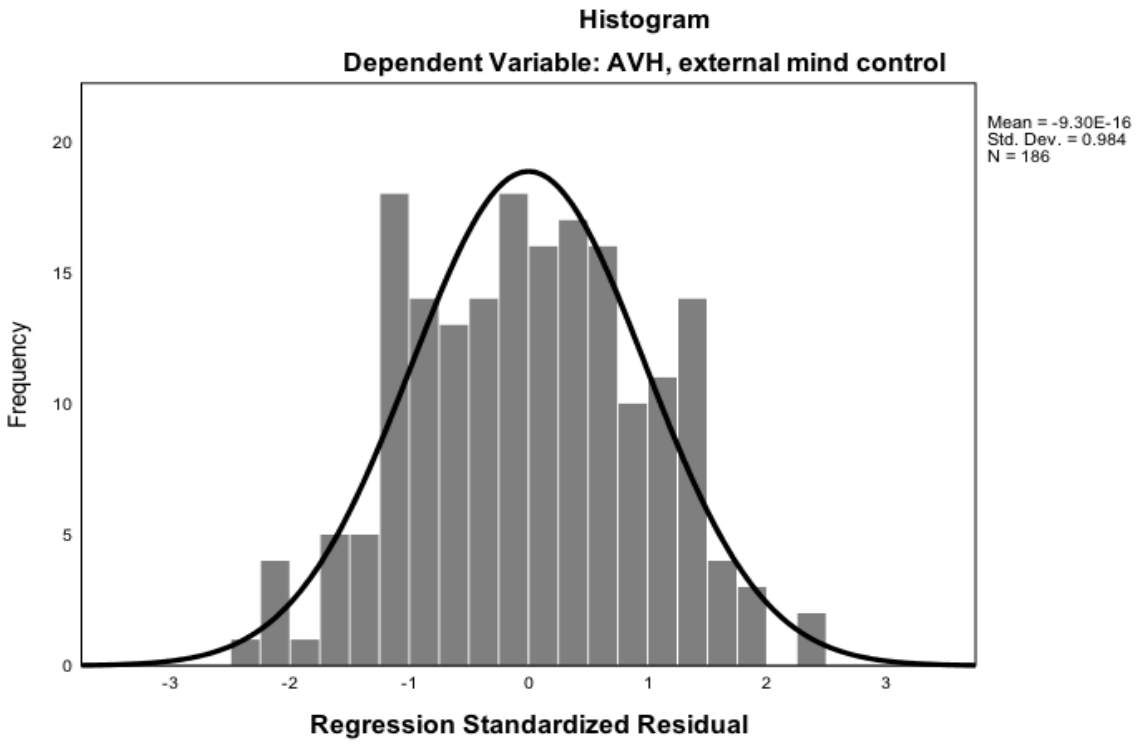
	Psychoticism	Feeling inferior	Temper outbursts	Obsessive compulsiveness	Age of relocation
Significance	$p < .05$	$p < .05$	$p < .05$	$p > .05$	$p < .05$

Note. Data exported from SPSS output.

Significant findings of the Shapiro-Wilks test (except for obsessive compulsiveness) indicate possible deviations from normally distributed data. Shapiro-Wilks is known for robust representations that might not always be appropriate for non-simulated data. Field (2013) stated that small size samples were vulnerable to the design of the Shapiro-Wilks that was geared toward larger samples. The author encouraged the use of graphic representations and make informed decisions independent of Shapiro-Wilks results based on converging evidence. Figures below present such evidence.

Figure 15

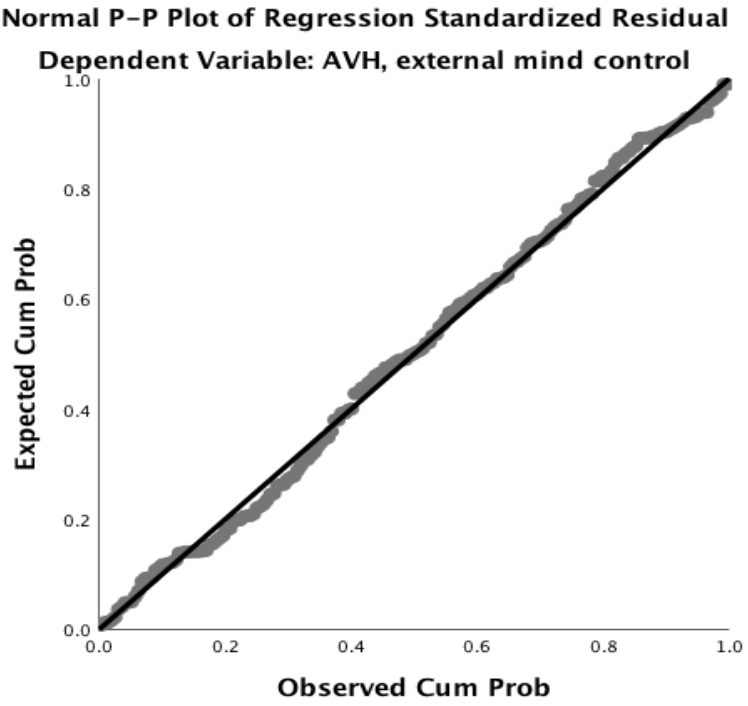
The Histogram of the Distribution of the Dependent Variable of Psychoticism



Note. Distribution of the variable psychoticism appears to be approximately normal.

Figure 16

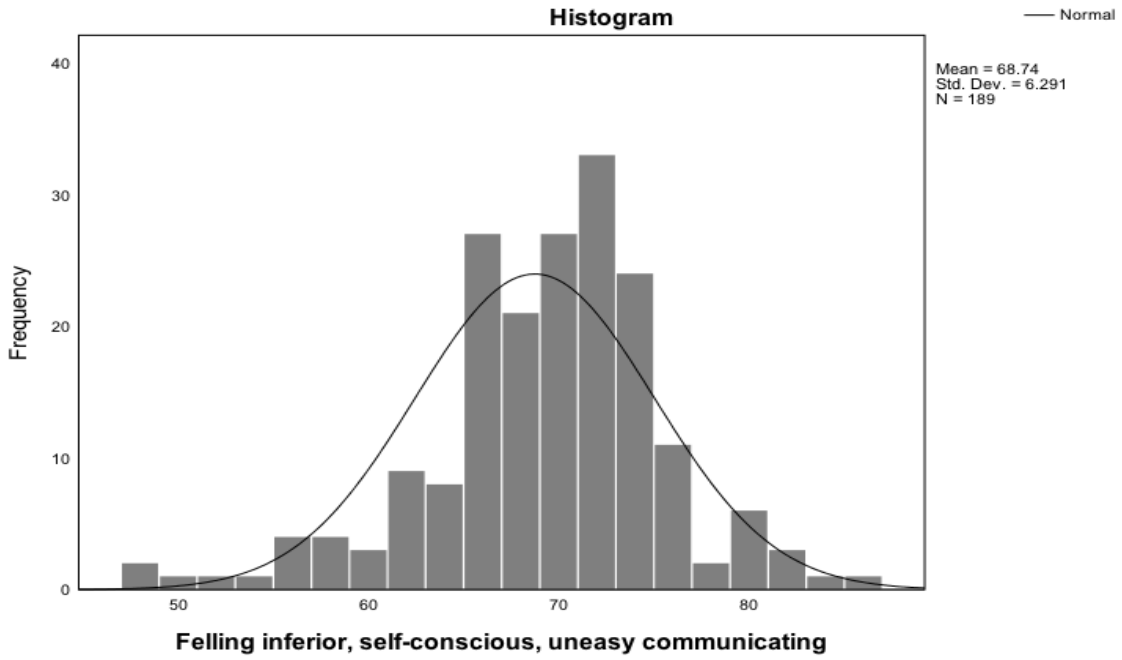
Normal P-P plot of the Dependent Variable Psychoticism



Note. Grouping of data around the fit line indicates that the distribution of the variable psychoticism is approximately normal.

Figure 17

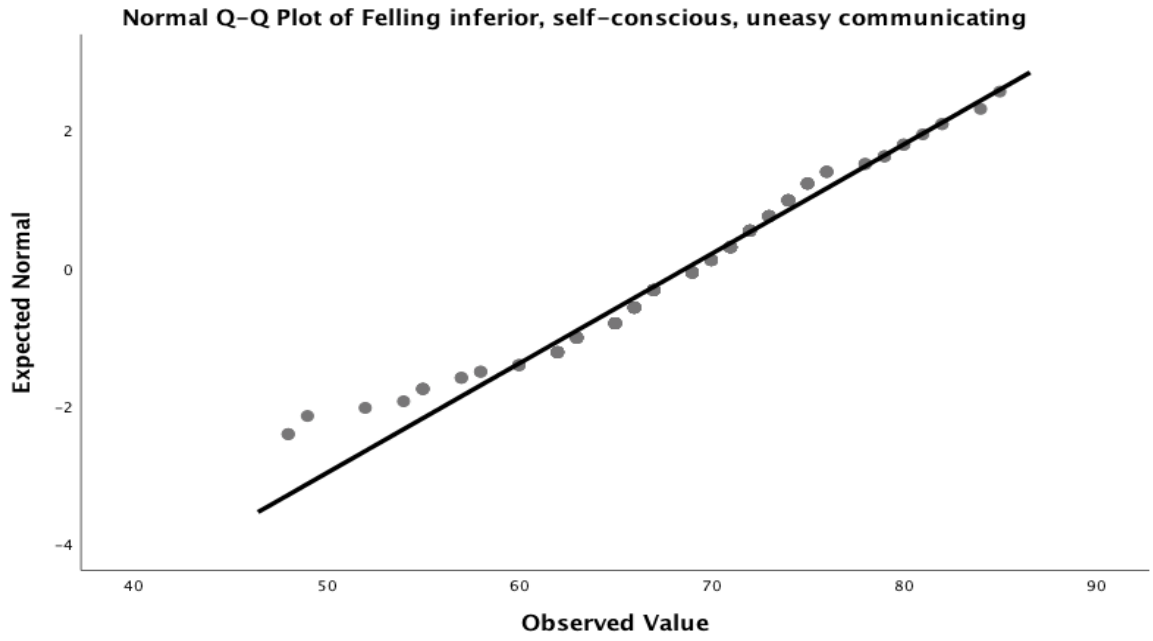
The Histogram of the Distribution of the Independent Variable of Interpersonal Sensitivity



Note. Distribution of the variable interpersonal sensitivity appears to be approximately normal.

Figure 18

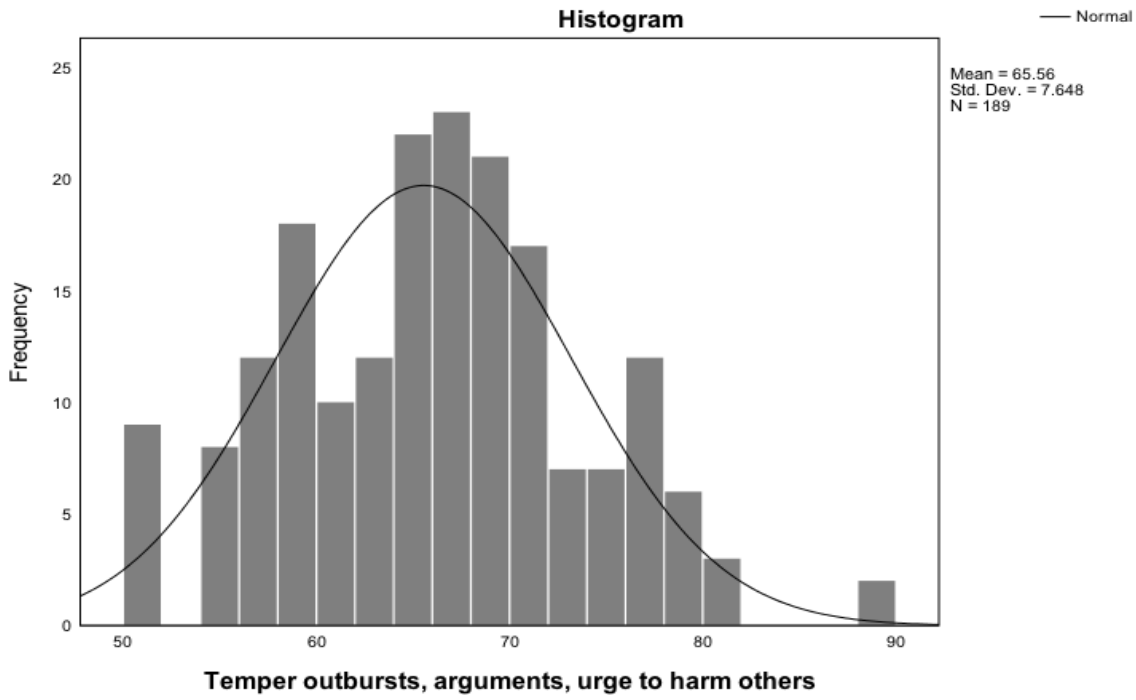
The Q-Q Plot of Distribution of the Independent Variable Interpersonal Sensitivity



Note. Grouping of data around the fit line indicates that the distribution of the variable interpersonal sensitivity is approximately normal.

Figure 19

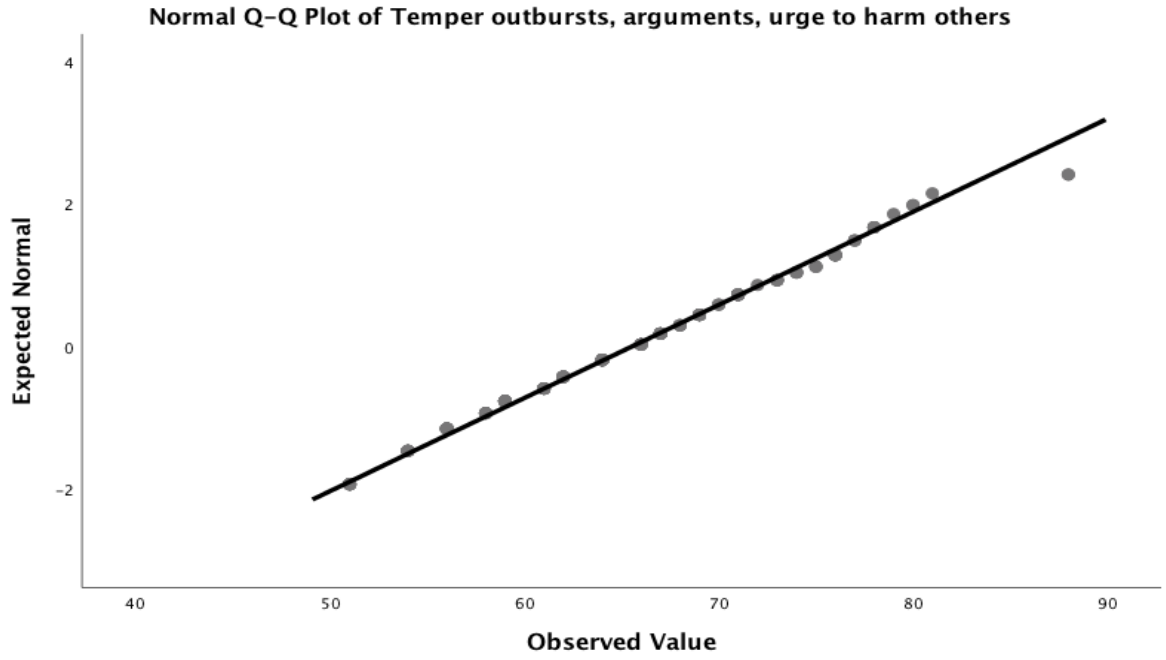
The Histogram of Distribution of the Independent Variable of Hostility



Note. Distribution of the variable hostility appears to be approximately normal.

Figure 20

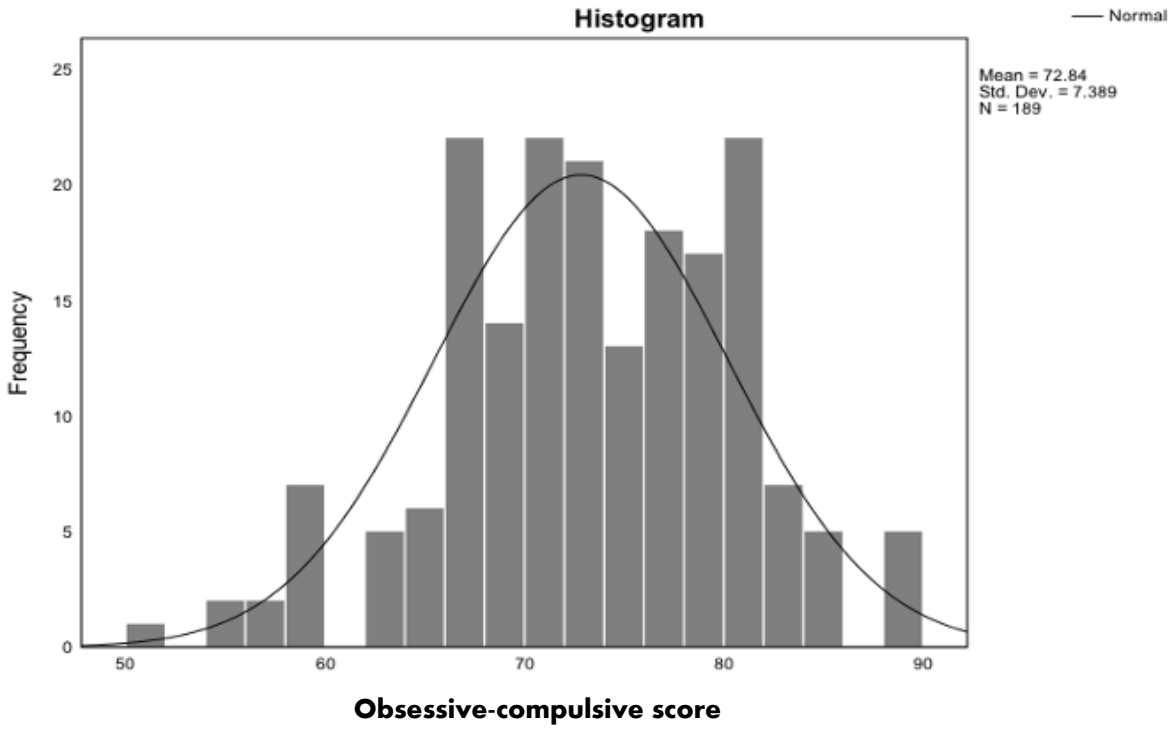
The Q-Q Plot Distribution of the Independent Variable Hostility



Note. Grouping of data around the fit line indicates that the distribution of the variable hostility is approximately normal.

Figure 21

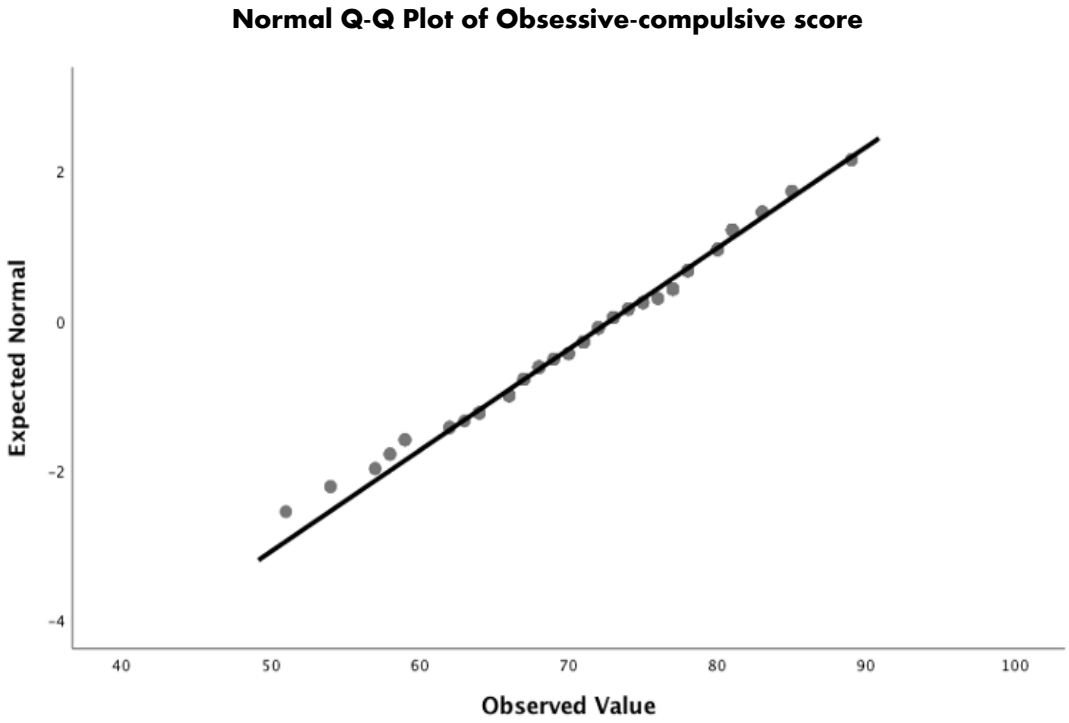
The Histogram of Distribution of the Independent Variable of Obsessive Compulsiveness



Note. Distribution of the variable obsessive compulsiveness appears to be approximately normal.

Figure 22

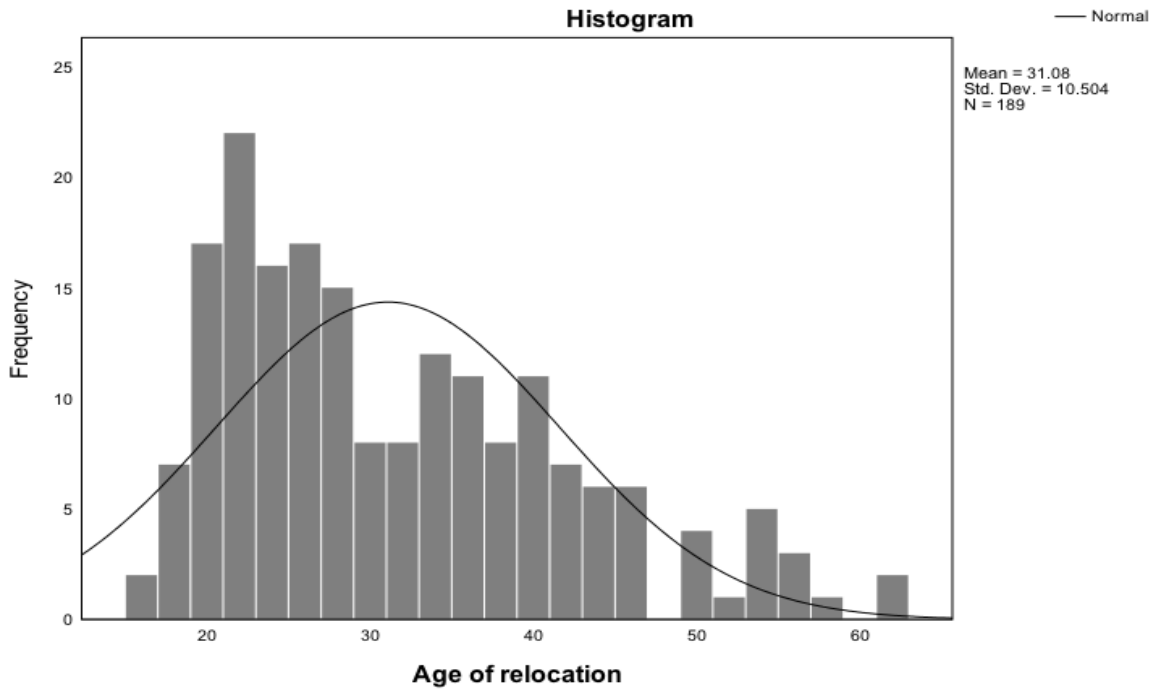
The Q-Q Plot Distribution of the Independent Variable Obsessive Compulsiveness



Note. Grouping of the data around the fit line indicates that the distribution of the variable obsessive compulsiveness is approximately normal.

Figure 23

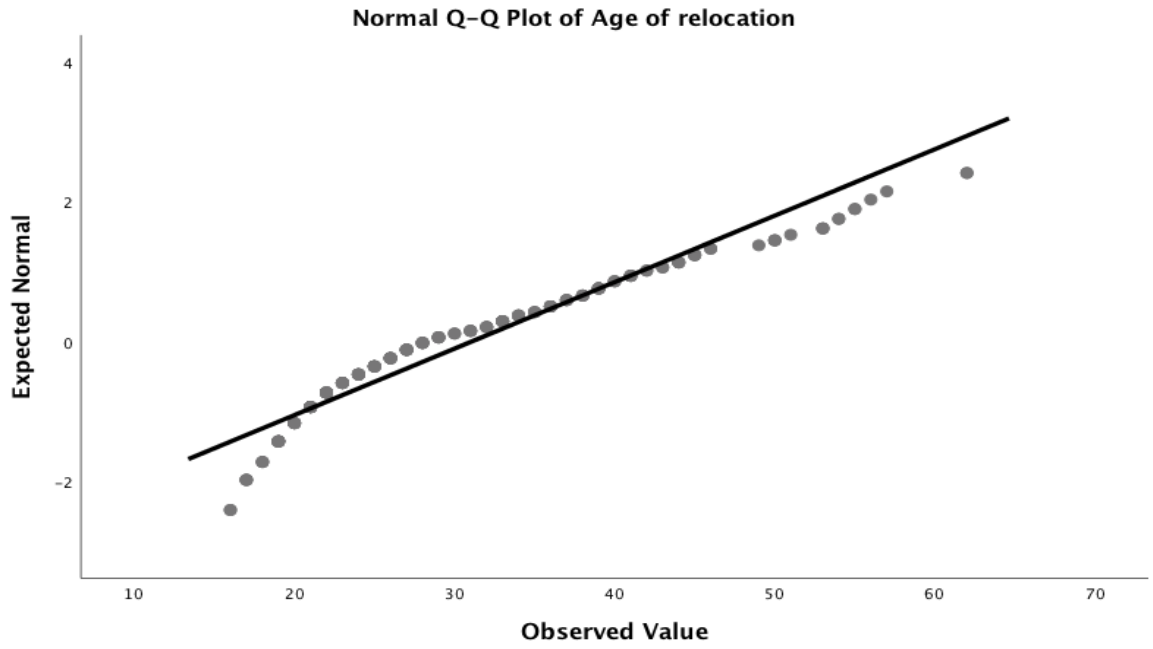
The Histogram of Distribution of the Independent Variable Age of Immigration



Note. Distribution of the variable age of relocation appears to be approximately normal.

Figure 24

The Q-Q Plot Distribution of the Independent Variable Age of Relocation



Note. Grouping of the data around the fit line indicates that the distribution of the variable age of relocation is approximately normal.

The regression model meets the assumption of normality as well as other assumptions. Meeting requirements of quality control allow this model to be calculated using the methods of multiple linear and hierarchical regressions.

Statistical Analysis Results

The purpose of this study was to analyze relationships between psychoticism as the dependent variable, and psychological and psychosocial factors as independent variables. This subchapter presents statistical findings organized according to research questions.

Research Question 1

RQ_1: To what extent does interpersonal sensitivity predict psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant?

H_{01}: Interpersonal sensitivity is not a statistically significant predictor of psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A1}: Interpersonal sensitivity is a statistically significant predictor of psychoticism when hostility, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

In order to answer this question, the analysis of variance (ANOVA) and multiple regression were conducted. ANOVA returned statistically significant findings: F (6, 179) = 13.09, $p < .05$, with $R^2 = .31$, $\eta^2 = .55$. The coefficient R^2 indicated the percentage of the variability in the dependent variable of psychoticism that is attributable to the variability of independent variables. Thus, 31% of the variability in the dependent variable psychoticism is attributable to the combined variability of independent variables. Effect size of the model is not produced in the SPSS set of commands *Linear Regression* but can be calculated in the set of commands *General Linear Model* or calculated as a relationship between the sum of squares between the group and the total amount of variance in the model (Field, 2013).

$\eta^2 = 3238.65/10620.62 = .30$

$\eta = \sqrt{.30} = .55$

According to Field (2013), $\eta = .55$ indicated a large effect size. The factual effect size is significantly higher that the proposed $\eta_p = .30$ (refer to G*Power analysis), thus, adding to the validity and generalizability of this research.

Table 12

ANOVA for the Model Including All Variables

Model		Sum of Squares	*df*	Mean Square	*F*	*p*
1	Regression	3238.653	6	539.776	13.089	.000
	Residual	7381.971	179	41.240		
	Total	10620.624	185			

Note. Dependent Variable: AVH, external mind control.

Predictors: (Constant), English language proficiency, Age of relocation, Temper outbursts (hostility), Gender of a participant, Obsessive compulsive score, Felling inferior (interpersonal sensitivity).

The analysis of variance for the full model returned significant findings, therefore, multiple linear regression can be conducted. Analysis of predictive powers of each of the independent variables will be conducted from the table containing coefficients for the full model.

Table 13

Coefficients for the Overall Model

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	*t*	*p*
1	(Constant)	18.617	6.306		2.952	.004
	Felling inferior, self-conscious, uneasy communicating	.210	.106	.174	1.992	.048
	Temper outbursts, arguments, urge to harm others	.152	.070	.154	2.165	.032
	Obsessive compulsive score	.250	.086	.245	2.908	.004
	Gender of a participant	2.602	1.005	.172	2.589	.010
	Age of immigration	-.007	.047	-.009	-.142	.888
	English language proficiency	.618	.189	.209	3.280	.001

Note. Dependent Variable: AVH, external mind control.

Independent variables: feeling inferior (interpersonal sensitivity), temper outbursts (hostility), obsessive compulsiveness, gender, age of immigration, and English language proficiency.

Based on the findings of the MLR, interpersonal sensitivity is a statistically significant predictor of psychoticism with $p < .05$ (refer to Table 13). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. For every unit increase in interpersonal sensitivity, there will be .21 units increase in psychoticism controlling for other independent variables.

Research Question 2

RQ_2: To what extent does hostility predict psychoticism when interpersonal sensitivity, obsessive compulsiveness, gender, age of immigration, and English language proficiency, are held constant?

H_{02}: Hostility is not a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A2}: Hostility is a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant.

Based on the findings of the MLR, hostility is a statistically significant predictor of psychoticism with $p < .05$ (refer to Table 13). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. For every unit increase in hostility, there will be .15 units increase in psychoticism, controlling for other independent variables.

Research Question 3

RQ_3: To what extend does obsessive compulsiveness predict psychoticism when interpersonal sensitivity, hostility, gender, age of immigration, and English language proficiency are held constant?

H_{03}: Obsessive compulsiveness is not a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

H_{A3}: Obsessive compulsiveness is a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

Based on the findings of the MLR, obsessive compulsiveness is a statistically significant predictor of psychoticism with $p < .05$ (refer to Table 13). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. For every unit increase in obsessive compulsiveness, there will be .25 units increase in psychoticism, controlling for other independent variables.

Research Question 4

RQ_4: To what extent does gender predict psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, age of immigration, and English language proficiency are held constant.

H_{04}: Gender is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, age of immigration, and English language proficiency are held constant.

H_{A4}: Gender is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, age of immigration, and English language proficiency are held constant.

Based on the findings of the MLR, gender is a statistically significant predictor of psychoticism with $p < .05$ (refer to Table 13). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. For every unit increase in gender, there will be 2.6 units increase in psychoticism, controlling for other independent variables. The

variable is binomial with male = 1and female = 2, therefore, female gender has a positive and more profound correlation with psychoticism.

Research Question 5

RQ_5: To what extent does age of immigration predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, mental health history, and English language proficiency are held constant.

H_{05}: Age of immigration is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, gender, and English language proficiency are held constant.

H_{A5}: Age of immigration is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, gender, and English language proficiency are held constant.

Based on the findings of the MLR, age of immigration is not a statistically significant predictor of psychoticism with $p > .05$ (refer to Table 13). Therefore, the null hypothesis was accepted, and the alternative hypothesis was rejected.

Research Question 6

RQ_6: To what extent does English language proficiency predict psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, gender, and age of immigration are held constant?

H_{06}: English language proficiency is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, gender, and age of immigration are held constant.

H_{A6}: English language proficiency is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive compulsiveness, gender, and age of immigration are held constant.

Based on the findings of the MLR, language proficiency is a statistically significant predictor of psychoticism with $p < .05$ (refer to Table 13). Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. For every unit increase in English language proficiency, there will be .62 units increase in psychoticism, controlling for other independent variables. The variable is binomial with English proficiency yes = 1 and English language proficiency no = 2. Therefore, a lack of English language proficiency significantly contributes in increase in psychoticism.

Hierarchical Multiple Regression

Assumptions of the hierarchical multiple regression are identical to linear models. While multiple linear regression answered research questions regarding predictive powers of independent variables in relation to psychoticism, the model did not account for possible interactions between independent variables. HMR was conducted to investigate relationships between independent variables by means of a gradual introduction of interpersonal sensitivity, hostility, obsessive compulsiveness, gender of participants, age of relocation, and English language proficiency. Independent variables were entered in the model one at a time, thus, producing six blocks.

The first block includes only one independent variables of interpersonal sensitivity and returned significant findings F (1,185) = 33.22, $p < .001$, $R^2 = .15$, $\eta_1 = .39$ (refer to Table 14). Therefore, interpersonal sensitivity is a statistically significant

predictor of psychoticism and accounted for 15 % of the variance (refer to Table 15).

Table 14

ANOVA for Multiple Regression

	Model	Sum of Squares	*df*	Mean Square	*F*	*p*
1	Regression	1624.300	1	1624.300	33.221	.000[b]
	Residual	8996.323	184	48.893		
	Total	10620.624	185			
2	Regression	2012.455	2	1006.228	21.391	.000[c]
	Residual	8608.168	183	47.039		
	Total	10620.624	185			
3	Regression	2529.804	3	843.268	18.969	.000[d]
	Residual	8090.819	182	44.455		
	Total	10620.624	185			
4	Regression	2794.953	4	698.738	16.161	.000[e]
	Residual	7825.671	181	43.236		
	Total	10620.624	185			
5	Regression	2795.007	5	559.001	12.858	.000[f]
	Residual	7825.617	180	43.476		
	Total	10620.624	185			
6	Regression	3238.653	6	539.776	13.089	.000[g]
	Residual	7381.971	179	41.240		
	Total	10620.624	185			

Note. The data were exported from SPSS output. Effect size was calculated by division of sum of squares by total sum of squares.

Table 15

Model Summary for Hierarchical Regression

Model	R	R^2	ΔR^2	ΔF
1	.391[a]	.153	.148	33.221
2	.435[b]	.189	.181	8.252
3	.488[c]	.238	.226	11.638
4	.513[d]	.263	.247	6.133
5	.513[e]	.263	.243	.001
6	.552[f]	.305	.282	10.758

Note. The data were exported from SPSS.

The second block included the second independent variable of hostility and returned statistically significant findings F (2,185) = 21.39, $p < .001$, $R^2 = .19$, $\eta_2 = .44$. Therefore, interpersonal sensitivity and hostility are statistically significant predictors of psychoticism and account for 19% of combined effect on variance in psychoticism.

The third block introduced an additional independent variable of obsessive compulsiveness and returned statically significant findings F (3, 185) = 18.97, $p < .001$, $R^2 = 24$, $\eta_3 = .49$. The block accounts for 24% of combined effect of variability of independent variables on the variability of the dependent variable. However, in contrast to the previous block, the independent variable interpersonal sensitivity became an insignificant predictor with p = .19. This is indicating a possible mediation from the variable obsessive compulsiveness hence hostility did not change the significance. This relationship will be investigated further in this chapter.

The fourth block introduced an additional variable of gender of participant and returned significant findings F (4, 185) = 16.16, $p < .001$, $R^2 = 26$, $\eta_4 = .51$. The block

accounts for 26% of combined effect of variability of independent variables on the variability of the dependent variable. The variable interpersonal sensitivity remained insignificant, although p values decreased from .19 to .09, indicating possible mediation from the variable gender of participants. In addition, the independent variable hostility changed p values from .01 to .03 also suggesting possible mediation effect from the variable gender of participant. This relationship will be investigated further in this chapter.

The fifth block added the independent variable age of relocation. The result of the analysis of the third block revealed statistical significance of the model F (5, 185) = 12.86, $p < .001$, $R^2 = 26$, $\eta_5 = .51$. The percentage of combined predictive variability did not change from that of the previous block because the newly introduced variable age of relocation is not a significant predictor of the dependent variable psychoticism. Other variables did not demonstrate any significant changes in the p value.

The sixth block includes all independent variables enumerated in the research questions, thus replicating the results of the multiple linear regression analyzed in the previous paragraph. There were no significant changes in p values of the independent variables, except the variable interpersonal sensitivity became a statistically significant predictor of psychoticism again, indicating a possible mediating effect from the variable introduced last, namely, English language proficiency. The possible effect of mediation will be investigated in the next paragraph.

Mediation Analysis

Mediation is the occurrence of a third variable - mediator- exerting influence on the relationships between the predictor and outcome variables (Field, 2013). The model of the third block of HMR presents the following event: a significant effect of predictor variable interpersonal sensitivity on dependent variable psychoticism reduced to insignificance after the introduction of the variable obsessive compulsiveness to the model. Baron and Kenny (1986) stated that if the previously significant relationship between predictor and outcome variables were no longer significant after the introduction of the third variable, the model demonstrates a strong mediation. The researcher hypothesized that obsessive compulsiveness is a statistically significant mediator in the relationship between interpersonal sensitivity and psychoticism.

RQ_{m1}: To what extent does obsessive compulsiveness mediate the relationship between interpersonal sensitivity and psychoticism?

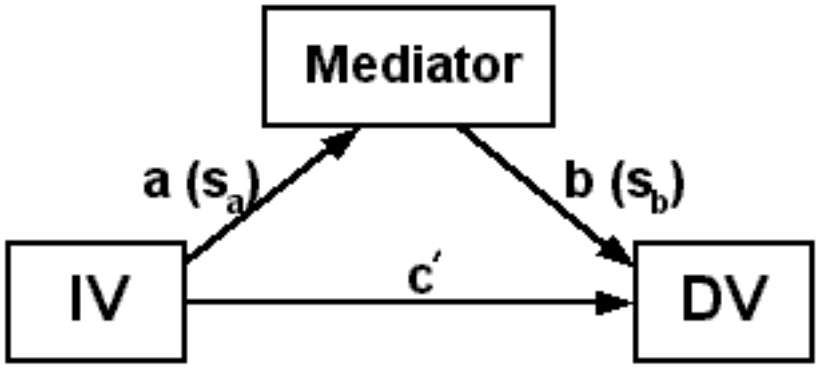
H_{0m1}: Obsessive compulsiveness is not a statistically significant mediator in the relationship between interpersonal sensitivity and psychoticism.

H_{Am1}: Obsessive compulsiveness is a statistically significant mediator in the relationship between interpersonal sensitivity and psychoticism.

Mediation utilized analyses of three paths: (1) bivariate relationship between predictor and outcome, (2) bivariate relationships between potential mediator and predictor, and (3) multivariable relationship between mediator and outcome variables (refer to Figure 25).

Figure 25

Illustration of Mediation Paths



Note: The figure illustrated paths of mediation. Variable of interpersonal sensitivity is an IV in the model, whereas variable obsessive compulsiveness is a potential mediator M, and psychoticism is a DV in the model. Adapted from "The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations," by R. Baron and D. Kenny, 1986, *Journal of Personality and Social Psychology, 51*(6), 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173. Copyright 1986 by the American Psychological Association.

The Sobel (1982) approach was used to analyze this relationship. The analysis included *a* - the unstandardized regression coefficient for bivariate regression between IV and M, *Sa* - a standard error of *a*, *b* - unstandardized coefficient for multiple regression between M and DV, when IV is also included, and *Sb* – standard error of *b*.

Figure 26

Sobel Test Calculation for Mediation 1

Input:			Test statistic:	Std. Error:	*p*-value:
a	0.764	Sobel test:	3.30263609	0.06916778	0.00095781
b	0.299	Aroian test:	3.29198689	0.06939153	0.00099482
s_a	0.064	Goodman test:	3.31338931	0.0689433	0.00092173
s_b	0.087	Reset all	Calculate		

Note. Adapted from "Calculation for the Sobel test: An interactive calculation tool for mediation tests," by K. Preacher and G. Leonardelli, 2001, http://quantpsy.org/sobel/sobel.htm

Based on $p < .001$, the null hypothesis is rejected, and the alternative hypothesis is accepted. Variable obsessive compulsiveness is a statistically significant full mediator of the relationship between interpersonal sensitivity and psychoticism.

The model of the block six also demonstrates a significant change in the effect of interpersonal sensitivity on psychoticism after introduction of the variable English language proficiency. The previously insignificant relationship between the predictor (interpersonal sensitivity) and the outcome variable (psychoticism) became significant.

RQ_{m2}: To what extent does English language proficiency mediate the relationship between interpersonal sensitivity and psychoticism?

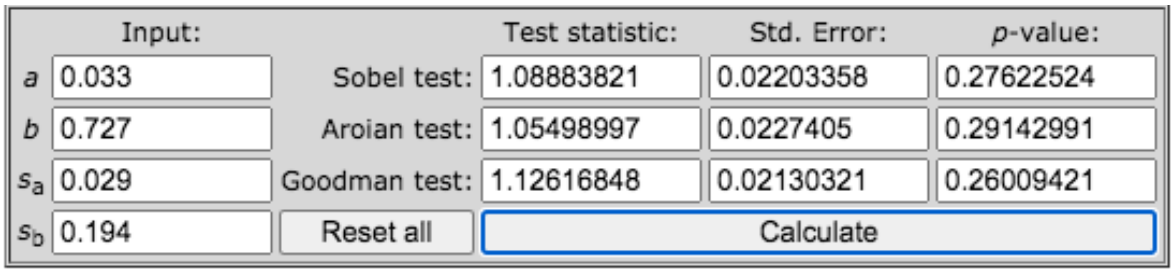
H_{0m2}: English language proficiency is not a statistically significant mediator in the relationship between interpersonal sensitivity and psychoticism.

H_{Am2}: English language proficiency is a statistically significant mediator in the relationship between interpersonal sensitivity and psychoticism.

The Sobel test, however, returned no significant mediation.

Figure 27

Sobel Test Calculation for Mediation 2



Input:			Test statistic:	Std. Error:	*p*-value:
a	0.033	Sobel test:	1.08883821	0.02203358	0.27622524
b	0.727	Aroian test:	1.05498997	0.0227405	0.29142991
s_a	0.029	Goodman test:	1.12616848	0.02130321	0.26009421
s_b	0.194	Reset all	Calculate		

Based on p > .05, the null hypothesis fails to be rejected, therefore, English language proficiency is not a statistically significant mediator of the interpersonal sensitivity in the relationship to psychoticism. Considering that $R^2 = 31$, meaning that only 31% of the variance of psychoticism is attributable to the combined variance of six dependent variables and there were no significant changes in other dependent variables, it is possible that one or more variables not accounted in the model had mediating effect on the variable interpersonal sensitivity.

Summary

The focus of this study was the investigation of relationships between psychological and psychosocial factors and psychoticism among immigrants from Central Asia. Statistical analyses of the sufficient population sample returned results that answered the research questions of this work. Psychological factors such as interpersonal sensitivity, hostility, and obsessive compulsiveness were statistically significant predictors of psychoticism when controlled for other variables. Psych-social factors such as gender and language proficiency were also found to be significant predictors of

psychoticism when controlled for other variables. In contrast, the age of immigration did not demonstrate a significant impact on psychoticism. Secondary statistical analyses focused on interactions between independent variables accounted for in the stepwise model of regression. The approach returned findings of a mediation effect of obsessive compulsiveness on interpersonal sensitivity.

In the next chapter, an elaborate explanation will be provided connecting these findings and foci of the study. The chapter will begin with revisiting research questions and hypotheses, continuing with the results of statistical operations in regard to every research question. The chapter will conclude with recommendations, implications for social change, and direction for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Psychiatric illnesses are prevalent and heterogeneous disorders that affect approximately 5% of the general population (Clark et al., 2018) and often lead to life-long disabilities and loss of productivity. Immigration-related stress is a significant factor contributing to the development or exacerbation of these illnesses, increasing the number of the people in the population at-risk exponentially. Shekunov (2016) identified a two- to three-fold increased risk of schizophrenia among immigrants. Failure to recognize factors contributing to the increased prevalence of SPMI among immigrants may lead to ineffective prevention, inadequate treatment, and prolonged chronicity of these illnesses.

This quantitative study was conducted to analyze relationships between psychological comorbidities, psychosocial factors, and psychoticism. Research questions included variables of (a) interpersonal sensitivity, (b) hostility, and (c) obsessive-compulsiveness as psychological comorbidities. In addition, research questions included psychosocial factors, such as (a) gender, (b) age of immigration, and (c) English language proficiency.

This chapter provides an elaborate interpretation of the results of the statistical analysis. Later in this chapter, I compare the description of post hoc limitations with the limitations prior to conducting the study. The chapter concludes with recommendations for further research and implications for positive social change.

Interpretation of the Findings

The aim of this study was to investigate relationships between psychological and psychosocial factors of psychoticism by formulating six research questions and corresponding sets of hypotheses.

Research Question 1

RQ_1: To what extent does interpersonal sensitivity predict psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant?

H_{01}: Interpersonal sensitivity is not a statistically significant predictor of psychoticism when hostility, obsessive compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A1}: Interpersonal sensitivity is a statistically significant predictor of psychoticism when hostility, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

This study found that interpersonal sensitivity was a significant predictor of psychoticism when other factors were held constant. The result of the analysis confirmed and extended relevant findings present in the current literature. Browne et al. (2017) studied emotional sensitivity on immigrants relocating to Canada. Mayorga et al. (2018) investigated affective symptomatology among the population of Latino immigrants. While congruent with the findings of the above studies, this work extends its findings to the population of Central Asians immigrating to the United States.

Research Question 2

RQ_2: To what extent does hostility predict psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency, are held constant?

H_{02}: Hostility is not a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

H_{A2}: Hostility is a statistically significant predictor of psychoticism when interpersonal sensitivity, obsessive-compulsiveness, gender, age of immigration, and English language proficiency are held constant.

The study found that hostility was a statistically significant predictor of psychoticism when other variables were held constant. This finding of the study confirms pertinent findings in existing literature (e.g., Chavez et al., 2019; Garcia et al., 2017; Mangold et al., 2007). This work, however, provides information about Central Asian immigrants, which was previously unavailable.

Research Question 3

RQ_3: To what extend does obsessive-compulsiveness predict psychoticism when interpersonal sensitivity, hostility, gender, age of immigration, and English language proficiency are held constant?

H_{03}: Obsessive-compulsiveness is not a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

H_{A3}: Obsessive-compulsiveness is a statistically significant predictor of psychoticism when hostility, interpersonal sensitivity, gender, age of immigration, and English language proficiency are held constant.

The study found that obsessive-compulsiveness was a statistically significant predictor of psychoticism when other variables were held constant. This result of the research is congruent with findings of previously published sources (Cederlof et al., 2015; Raveendranathan et al., 2012).

Research Question 4

RQ_4: To what extent does gender predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant?

H_{04}: Gender is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant.

H_{A4}: Gender is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, age of immigration, and English language proficiency are held constant.

The study found that the gender of participants was a statistically significant predictor of psychoticism when other variables were held constant. Current literature offers a number of research articles stipulating significance of gender in the development of psychosis. Female immigrants may have more difficulties to emotionally negotiate uprooting of familiar lifestyles in the countries of origin and adapt to new ways of life in

host countries. The findings of the study replicated results of previous research on the significance of gender in proneness to SPMI (Barajas et al., 2015; Hui et al., 2016; Ochoa et al., 2012), yet extending existing knowledge by including information about the target population.

Research Question 5

RQ_5: To what extent does age of immigration predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, mental health history, and English language proficiency are held constant?

H_{05}: Age of immigration is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and English language proficiency are held constant.

H_{A5}: Age of immigration is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and English language proficiency are held constant.

The study found that age immigration was not a statistically significant predictor of psychoticism when other variables were held constant. Although the correlation between age of immigration and psychoticism is not statistically significant in this study, there may be a clinical significance of age of immigration variable to some patients, albeit non-transferable to the general population. The result of the analysis contributes to close the knowledge gap about factors influencing the development or exacerbation of psychotic spectrum illnesses among Central Asian immigrants to the United States. The independence between psychoticism and the age of immigration may indicate that

individuals from the target population are at risk for SPMI regardless of how old they were when relocated to the United States. This result of the statistical analysis disconfirms findings available in modern literature (Anderson & Edwards, 2020; Shekunov, 2016; Veling, 2011). This misalignment is not surprising considering the specifics of the population of Central Asia in comparison to other more well-researched immigrant populations (e.g., immigrants from Central America or India).

Research Question 6

RQ_6: To what extent does English language proficiency predict psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant?

H_{06}: English language proficiency is not a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant.

H_{A6}: English language proficiency is a statistically significant predictor of psychoticism when interpersonal sensitivity, hostility, obsessive-compulsiveness, gender, and age of immigration are held constant.

The study found that English language proficiency was a statistically significant predictor of psychoticism when other variables were held constant. Immigrants who demonstrate advanced English language competencies may have better chances for gainful employment, diminished culture shock, faster integration into the lifestyles of host countries, and a less stressful process of assimilation. This result confirms findings of previous research (Bauer et al., 2010; Valdez et al., 2013; Ventriglio et al., 2014) and

contributes to the field of mental health by adding information about the population of Central Asian immigrants to the United States.

Mediation Analysis

During the primary analysis of relationships between variables, a significant change in predictive powers was noticed for a pair of independent variables: interpersonal sensitivity and obsessive compulsiveness. This relationship was further investigated by using Sobel's analysis of mediation. Upon introduction of the variable obsessive-compulsiveness, the variable interpersonal sensitivity became insignificant. It is not uncommon that people under conditions of uncertainty resort to ritualizing and rigid patterns of behavior, thus reducing the personal vulnerability and the level of perceived inferiority. The OCD Center of Los Angeles (2010) stated that individuals with obsessive-compulsive tendencies used compulsive strategies to create an artificial sense of certainty and order. The result of the mediation analysis confirmed this notion extending its applicability to the population of Central Asian immigrants to the United States.

The findings of the study are aligned with the theoretical foundation, including theories of the psychotic continuum, acculturative stress, and stress vulnerability. Elevated levels of interpersonal sensitivity (e.g., feeling inferior) contribute to the mental vulnerability of immigrants, often leading to the increased probability of developing psychotic symptoms. Similar to that, increased anger, hostility, and temper outbursts may serve as destabilizing factors to the mental equilibrium of immigrants, further deepening their vulnerability and proneness to psychotic illnesses. It is not uncommon for

individuals to adopt ritualistic behaviors, especially under conditions of uncertainty, which the immigration process provides aplenty. Tendencies to create an atmosphere of familiarity and sureness as anchors in the reality of new environments could be stabilizing factors with pronounced biphasic effects. However, if these tendencies transmit into obsessive compulsiveness, these traits become significant predictors of psychoticism and risk factors of SPMI. Female participants in this study demonstrated a more pronounced vulnerability to psychotic illnesses, which could be explained by more vulnerable affective states, especially in cases that involve separation from children (which could be an interesting direction for future research). Limited knowledge of the English language could restrict the speed and success of the assimilation process among Central Asian immigrants, contributing to the increased level of stress and proneness to SPMI. Furthermore, linguistic competencies (or lack thereof) may change the duration of the initial phase of adaptation by prolonging it instead of reducing. During this stage, individuals who try to find footing in the new country could become more vulnerable to develop new or exacerbate existing proneness to SPMI.

Limitations of the Study

For research to meaningfully contribute to the field, it has to be reliable and valid. During the proposal phase, parameters of reliability, validity, and generalizability were established via the analysis of population characteristics, sample size strategies, procedures, and instruments used. As proposed, the study utilized archival data that included information derived from the standardized assessment SA-45 (Strategic Advantage, 1996) and patient interviews. The study aimed at the investigation of

relationships between the dependent variable and independent variables using the method of multiple linear regression. The actual performance of statistical operations exceeded the proposed analysis by adding the hierarchical multiple regression and the analysis of mediation. The study found a statistically significant and meaningful mediating effect between obsessive-compulsiveness and interpersonal sensitivity, providing new actionable information to the field of mental healthcare. The study also exceeded the proposed scope of reliability by using a larger sample size than was absolutely necessary. According to sample size strategies and supporting documents, the target sample size was decided to be between 53 and 97 participant cases. The actual number of participant cases reached 195 cases, thus increasing the effect size from the proposed $\eta_p = .30$ to factual $\eta = .55$. Such an increase contributes to the validity and generalizability of this work. As delineated in the proposal of this work, the generalizability of the research is restricted by the specifics of the target population. The findings of the study may be relevant to the population of immigrants of Central Asia and have limited value in pertains to other populations. Considering the above adjustments that took place when conducting the actual study, the trustworthiness of the study exceeded the expectations set in the proposal phase.

Recommendations

Building on the strengths of this study, further research should explore protective and risk factors among immigrants, particularly for those from Central Asia. One of the strengths of this work is the in-depth analysis of relationships between psychological comorbidities, psychosocial factors, and psychoticism as a foreteller of SPMI. However,

there are other avenues that may be explored in the same direction. For example, future studies may accentuate on the investigation of correlations between depression and other factors. Depression among immigrants is a significant problem causing personal struggles, loss of labor, increased healthcare costs and the possible loss of immigration approval. Foo et al. (2018) stated that the process of uprooting in countries of origin and challenges of assimilation in countries of destination often manifest in the development of depression. Future research yield productive results examining the probability of developing anxiety due to various factors. Blackmore et al. (2020) stated that anxiety was one of the most prevalent psychiatric manifestations along with PTSD, depression, and psychosis. The variable anxiety can be created as a binomial categorical variable from the existing data and logical regression would be a suitable statistical operation to analyze odds and probabilities of anxiety based SPMI.

Future research may also benefit from an analysis of the weaknesses of this work. While the binomial variable of gender cannot be changed for obvious reasons, the variable of the English language can. The nature of this variable "yes" for the English language or "no", however, the dichotomy does not account for the continuum. Some immigrants may have limited ability to speak English, yet this ability is sufficient to communicate and function in an English-speaking community. Furthermore, a more granular approach to English language proficiency should distinguish between speaking, writing, understanding, and reading (e.g., taking a telephone order requires minimal reading and writing abilities but advanced competency in the understanding of spoken language). This work did not include in the analysis the place of residence of immigrants,

for example, predominantly English-speaking areas, neighborhoods of mixed cultures, areas of Russian enclaves, et cetera. Living in a familiar environment may have an opposite effect on immigrants. For example, living within a comfort zone of familiar culture may contribute to the reduced levels of anxiety among immigrants. On the other side, living in cultural enclaves may contribute to depression connected to perceived problems with assimilation. Current literature does not provide the field with publications regarding the role of cultural enclaves as protective or risk factors of SPMI among immigrants.

There are many possible directions that research involving Central Asian immigrants could take and this work can serve as a starting point in closing the gap in knowledge. Some directions may include strategic updates in the scope of research, whereas others may include minor adjustments in methodology.

Implications

The purpose of this study was to investigate relationships between psychoticism, psychological comorbidities, and psychosocial characteristics of Central Asian immigrants to the United States. The study found a statistically significant association between these factors and the findings of the study will have implications of several levels such as individual, familial, communal, and societal.

Identification of risk factors for SPMI would have the most profound effect on immigrants at risk. Individuals who require psychological help would have a better understanding of signs and symptoms of SPMI, the nature of these illnesses, course, and coping strategies. Those immigrants who do not manifest clinical presentation yet are at

risk for the development of SPMI would be able to prevent full flown psychosis by utilizing preventive measures. McFarlane (2011) stated that average rates of conversion to full psychosis were between 10% and 32%, depending on a variety of individual, clinical, and environmental factors. Norman et al. (2001) stated that the neurodegenerative process of SMPI could be delayed and even reversed with the implementation of early interventions. Such interventions could be put in place successfully if individuals at risk would recognize precipitating factors and seek psychological help. Understanding the nature of SPMI would have a positive social change in deflecting societal stigma and inoculate individuals at risk against self-imposed stigma. In turn, positive self-reception may have a stabilizing effect reducing proneness to SPMI, increased self-esteem, and improved adherence to treatment. On a familial level, this work is expected to inform immediate surroundings of immigrants-at-risk about signs and symptoms of SPMI. Mental health illnesses are family diseases and impose heavy burdens of care for mentally unstable or at-risk individuals. The ability to recognize these symptoms will empower family members to assist individuals at risk to seek professional help and decrease the probability of self-medication. It is not uncommon that individuals at risk often pursue to alleviate symptoms of SMPI through the use of illicit drugs, excessive consumption of alcohol, and other unlawful behaviors (Winklbaur et al., 2006). Due to immigration-related stress, newcomers are vulnerable to SMPI (Shekunov, 2016), putting them at higher risk of becoming victims or perpetrators of crime (Thornicroft, 2020). Understanding the nature of mental illnesses and abilities to evaluate risk factors among immigrants may contribute to the reduction of unlawful

behaviors contributing to the increased safety of communities as a whole. Mental health illnesses are one of the leading causes of life-long disabilities and a significant loss of productivity (Clark et al., 2018). The reduction of healthcare costs associated with SPMI is also one of the aims of this work. Preventive measures to avert full-blown psychosis, awareness of risk factors, improved safety, and developing more effective public policies are outcomes of positive social change expected from the findings of this study.

In addition to the positive social change, this study also informed the scientific community about multidimensional methods of scientific inquiry in studying the population of immigrants from Central Asia. This study utilized a three-dimensional approach to answer research questions: multiple linear regression, hierarchical regression, and Sobel mediation analysis. Such an approach may encourage other researchers to adopt more comprehensive inquiries as they account for wider varieties of contributing factors and accurate results.

Conclusion

Countries of Central Asia account for a significant number of immigrants to the United States. Immigration-related challenges of this population, however, are not adequately researched at present. This work provides the field with meaningful findings that explain relationships between psychiatric illnesses, psychological comorbidities, and psychosocial factors. Immigration is a lengthy process that includes leaving the known behind and choosing the unknown ahead. It can be challenging and emotionally taxing for many immigrants, often leading to developing and/or exacerbating mental health symptoms. This work focuses on the mental health needs of immigrants from Central

Asia, but there is a necessity for future research that includes other populations, for example, Ukrainian immigrants such as myself.

This work opens with the words of Roman poet Horace: "*Coelum non animum mutant qui trans mare currunt*", which means those who cross the sea, change the sky, but not the souls. People who cross the sea bring small bags filled with clothes, but hearts filled with big dreams. Dreams and hopes of our souls motivate us to take the journey but do not promise that all of us will make it. We carry pain and hurt that makes us vulnerable to invisible ailments while we are trying to perseverate and find a footing in this new world, under the new sky. We don't ask for much, just a warm welcome. Try to see us as equal, embrace us in this critical part of our journey, and understand our plights; they are similar to those of your parents or grandparents at some point in the past. Welcome us. You will not regret it, I promise.

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Appendix A: Data User Agreement

DATA USE AGREEMENT

This Data Use Agreement ("Agreement"), effective as of 03/30/2021. Effective Date is entered into by and between Viktor Dlugunovych, hereafter "Data Recipient" and Psychometrix, Inc, hereafter "Data Provider". The purpose of this Agreement is to provide Data Recipient with access to a Limited Data Set ("LDS") for use in research in accord with the HIPAA and FERPA Regulations.

1. Definitions. Unless otherwise specified in this Agreement, all capitalized terms used in this Agreement not otherwise defined have the meaning established for purposes of the "HIPAA Regulations" codified at Title 45 parts 160 through 164 of the United States Code of Federal Regulations, as amended from time to time.

2. Preparation of the LDS. Data Provider shall prepare and furnish to Data Recipient a LDS in accord with any applicable HIPAA or FERPA Regulations.

3. Data to be included in the LDS. **No direct identifiers such as names may be included in the Limited Data Set (LDS).** The researcher will not name the Data Provider in the doctoral study that is published in Proquest unless the Data Provider makes a written request for the researcher to do so. In preparing the LDS, Data Provider or designee shall include the **data fields specified as follows**, which are the minimum necessary to accomplish the research: patient's psycho-social information derived from interviews: gender, language proficiency, age of immigration, and psychological data derived from the Symptom Assessment-45(SA-45, Strategic Advantage, 1996).

4. Responsibilities of Data Recipient. Data Recipient agrees to:

a. Use or disclose the LDS only as permitted by this Agreement or as required by law;

b. Use appropriate safeguards to prevent use or disclosure of the LDS other than as permitted by this Agreement or required by law;

c. Report to Data Provider any use or disclosure of the LDS of which it becomes aware that is not permitted by this Agreement or required by law;

d. Require any of its subcontractors or agents that receive or have access to the LDS to agree to the same restrictions and conditions on the use and/or disclosure of the LDS that apply to Data Recipient under this Agreement; and

e. Not use the information in the LDS to identify or contact the individuals who are data subjects.

5. Permitted Uses and Disclosures of the LDS. Data Recipient may use and/or disclose the LDS for its research activities only.

6. Term and Termination.

a. Term. The term of this Agreement shall commence as of the Effective Date and shall continue for so long as Data Recipient retains the LDS, unless sooner terminated as set forth in this Agreement.

b. Termination by Data Recipient. Data Recipient may terminate this agreement at any time by notifying the Data Provider and returning or destroying the LDS.

c. Termination by Data Provider. Data Provider may terminate this agreement at any time by providing thirty (30) days prior written notice to Data Recipient.

d. For Breach. Data Provider shall provide written notice to Data Recipient within ten (10) days of any determination that Data Recipient has breached a material term of this Agreement. Data Provider shall afford Data Recipient an opportunity to cure said alleged material breach upon mutually agreeable terms. Failure to agree on mutually agreeable terms for cure within thirty (30) days shall be grounds for the immediate termination of this Agreement by Data Provider.

e. Effect of Termination. Sections 1, 4, 5, 6(e) and 7 of this Agreement shall survive any termination of this Agreement under subsections c or d.

7. Miscellaneous.

a. Change in Law. The parties agree to negotiate in good faith to amend this Agreement to comport with changes in federal law that materially alter either or both parties' obligations under this Agreement. Provided however, that if the parties are unable to agree to mutually acceptable amendment(s) by the compliance date of the change in applicable law or regulations, either Party may terminate this Agreement as provided in section 6.

b. Construction of Terms. The terms of this Agreement shall be construed to give effect to applicable federal interpretative guidance regarding the HIPAA Regulations.

c. No Third Party Beneficiaries. Nothing in this Agreement shall confer upon any person other than the parties and their respective successors or assigns, any rights, remedies, obligations, or liabilities whatsoever.

d. Counterparts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

e. Headings. The headings and other captions in this Agreement are for convenience and reference only and shall not be used in interpreting, construing or enforcing any of the provisions of this Agreement.

IN WITNESS WHEREOF, each of the undersigned has caused this Agreement to be duly executed in its name and on its behalf.

DATA PROVIDER

Signed: _____

Print Name: Igor Davidson, PhD

Print Title: Owner

Igor Davidson Ph.D.
Clinical Psychologist
NYS LIC #016113

DATA RECIPIENT

Signed: _____

Print Name: Viktor Dlugunovych, MBA

Print Title: Researcher

Appendix B: SA-45 Questionnaire

SA–45®

Client ID: _____ Age:_____ Gender: ❒Male ❒Female Date:_____/_____/_____

Other Comments:_____

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, circle the number on the right that best describes *how much that problem has bothered or distressed you during the past 7 days, including today.* Circle only one number for each problem, and do not skip any items.

	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Feeling lonely	1	2	3	4	5
2. Feeling blue	1	2	3	4	5
3. Feeling no interest in things	1	2	3	4	5
4. Feeling fearful	1	2	3	4	5
5. The idea that someone else can control your thoughts	1	2	3	4	5
6. Feeling others are to blame for most of your troubles	1	2	3	4	5
7. Feeling afraid in open spaces or on the streets	1	2	3	4	5
8. Hearing voices that other people do not hear	1	2	3	4	5
9. Feeling that most people cannot be trusted	1	2	3	4	5
10. Suddenly scared for no reason	1	2	3	4	5
11. Temper outbursts that you could not control	1	2	3	4	5
12. Feeling afraid to go out of your house alone	1	2	3	4	5
13. Other people being aware of your private thoughts	1	2	3	4	5
14. Feeling others do not understand you or are unsympathetic	1	2	3	4	5
15. Feeling that people are unfriendly or dislike you	1	2	3	4	5
16. Having to do things very slowly to ensure correctness	1	2	3	4	5
17. Feeling inferior to others	1	2	3	4	5
18. Soreness of your muscles	1	2	3	4	5
19. Feeling that you are watched or talked about by others	1	2	3	4	5
20. Having to check and double-check what you do	1	2	3	4	5
21. Difficulty making decisions	1	2	3	4	5
22. Feeling afraid to travel on buses, subways, or trains	1	2	3	4	5
23. Hot or cold spells	1	2	3	4	5
24. Having to avoid certain things, places, or activities because they frighten you	1	2	3	4	5
25. Your mind going blank	1	2	3	4	5
26. Numbness or tingling in parts of your body	1	2	3	4	5
27. Feeling hopeless about the future	1	2	3	4	5
28. Trouble concentrating	1	2	3	4	5
29. Feeling weak in parts of your body	1	2	3	4	5
30. Feeling tense or keyed up	1	2	3	4	5
31. Heavy feelings in your arms or legs	1	2	3	4	5
32. Feeling uneasy when people are watching or talking about you	1	2	3	4	5
33. Having thoughts that are not your own	1	2	3	4	5
34. Having urges to beat, injure, or harm someone	1	2	3	4	5
35. Having urges to break or smash things	1	2	3	4	5
36. Feeling very self-conscious with others	1	2	3	4	5
37. Feeling uneasy in crowds, such as shopping or at a movie	1	2	3	4	5
38. Spells of terror or panic	1	2	3	4	5
39. Getting into frequent arguments	1	2	3	4	5
40. Others not giving you proper credit for your achievements	1	2	3	4	5
41. Feeling so restless you couldn't sit still	1	2	3	4	5
42. Feelings of worthlessness	1	2	3	4	5
43. Shouting or throwing things	1	2	3	4	5
44. Feeling that people will take advantage of you if you let them	1	2	3	4	5
45. The idea that you should be punished for your sins	1	2	3	4	5

MHS

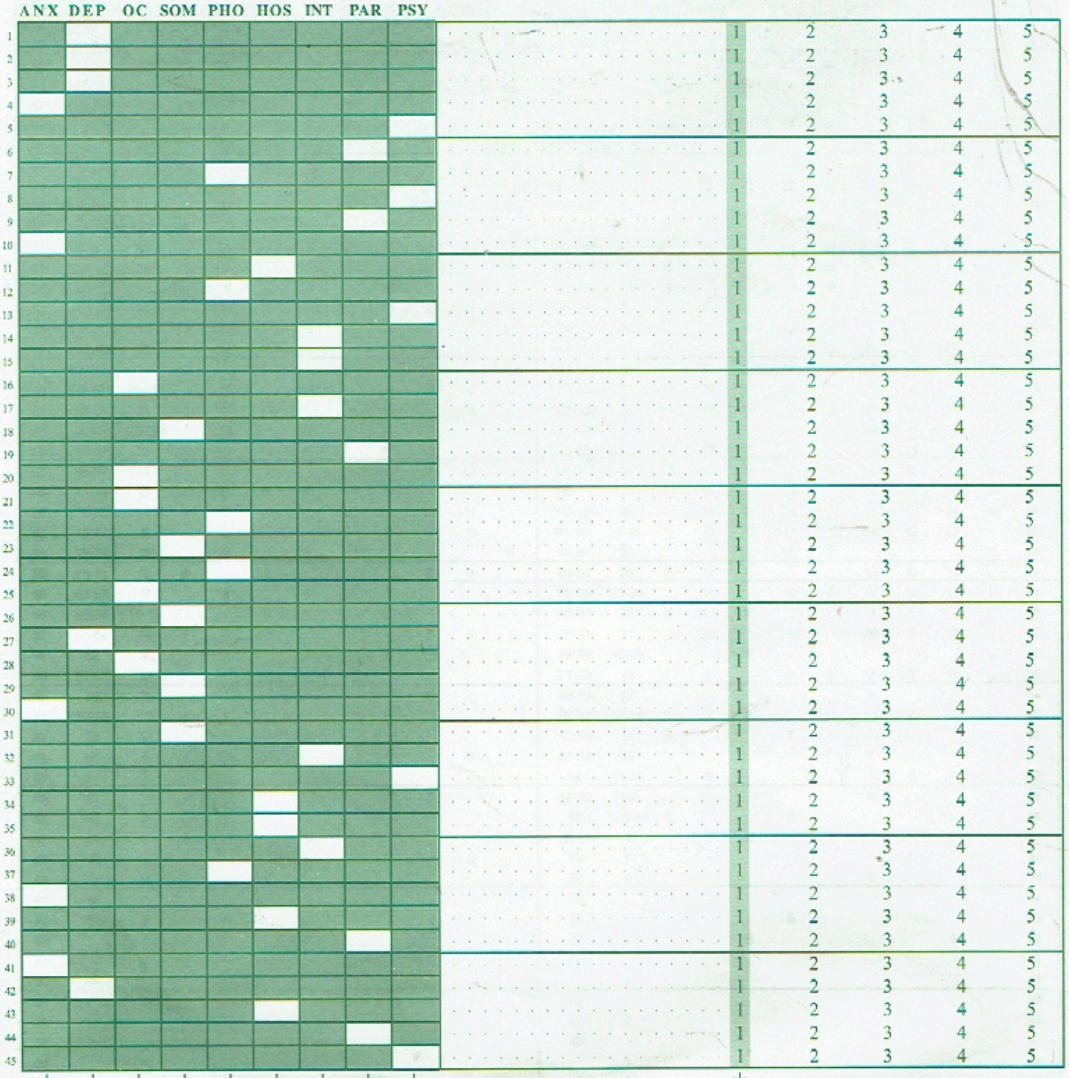
SA–45®

Client ID: _____ Age:____ Gender: ❒Male ❒Female Date:____/____/____

Other Comments:_____

_____ Name: _____

Copy the circled numbers across each row into the unshaded boxes. Sum each column and write each total in each box at the bottom. The GSI is the sum of the column totals. The PST is equal to 45 minus the total number of ones circled. For more detailed information about scoring and handling missing responses, consult the SA-45® Manual.



ANX DEP OC SOM PHO HOS INT PAR PSY

Sum columns for the subscale totals

Sum subscale totals for GSI → GSI

45 minus (Number of ones circled) = PST

Total Missing

SA–45® Male Nonpatient Profile

Name:_____ Age:____ Date:____/____/____

Male Adults

T	GSI	PST	ANX	DEP	OC	SOM	PHO	HOS	INT	PAR	PSY
>89	>210		>23				>23				
89	206-210				25	25	23				25
88	200-205		23				22	25			
87	194-199						21				
86	187-193		22			24				25	24
85	181-186	45	21	25	24		20	24	25		
84	175-180					23	19				23
83	170-174	44	20		23		18	23		24	22
82	164-169		19	24		22	17		24		
81	158-163	43			22		16	22			21
80	152-157	42	18		21	21	15	21	23	23	20
79	146-151		17	23		20	14	20			18-19
78	140-145	41		22	20	19	13	19	22	22	17
77	134-139	40	16		19			18		21	16
76	129-133	39		21	18	18	12	17	21	20	15
75	123-128	38	15	20		17	11		20		14
74	119-122	36-37	14	19	17	16		16	19	19	
73	114-118	35		18	16		10	15	18	18	13
72	110-113	33-34	13	17		15	9	14	17	17	12
71	106-109	32		16	15	14		13	16	16	11
70	102-105	31	12		14		8		15		10
69	99-101	29-30		15		13		12	14	15	
68	95-98	28	11	14	13			11		14	9
67	92-94	26-27		13		12	7		13		8
66	88-91	25	10	12	12	11		10	12	13	
65	85-87	24							11	12	
64	81-84	23		11	11	10		9			7
63	78-80	21-22	9	10	10		6		10	11	
62	75-77	20						8	9	10	
61	72-74	19		9		9					6
60	70-71	18	8		9				8	9	
59	67-69	17		8		8	5	7			
58	65-66	15-16			8						
57	63-64	14	7	7					7	8	5
56	62	13				7		6			
55	60-61	12			7						
54	59	11							6	7	
53	57-58	10	6	6							
52	56	9				6					
51	55	8			6			5		6	
50	54	7									
49	53			5					5		
48	52	6									
47	51	5	5			5					
46	50									5	
45		4			5						
44	49										
43	48	3									
42											
41	47	2									
40	46										
39		1									
38	45										
37											
36		0									
<36											

Male Adolescents

GSI	PST	ANX	DEP	OC	SOM	PHO	HOS	INT	PAR	PSY	T
											>89
225											89
224											88
223											87
221-222											86
220		25			25	25					85
218-219				25						25	84
216-217											83
213-215		24			24	24			25		82
210-212				24				25		24	81
205-209	45					23					80
199-204		23	25	23	23		25	24		23	79
193-198	44					22			24		78
188-192		22		22	22	21				22	77
180-185	43	21	24		21	20		23	23	21	76
173-179		20		21		19	24				75
167-172	42	19			20	18		22	22	20	74
161-166	41		23	20	19	17	23			19	73
154-160	40	18	22	19	18	16		21	21	18	72
148-153	39	17		18		15	22	20	20	17	71
141-147	38	16	21		17	14		19	19	16	70
134-140	37	15	20	17	16	13	21	18		15	69
127-133	36	14	19	16	15	12	20	17	18	14	68
121-126	35		18			11	19		17	13	67
116-120	33-34	13	17	15	14	10	18	16	16		66
111-115	32	12	16	14		9	17	15		12	65
106-110	30-31	11	15		13		16	14	15	11	64
102-105	29		14	13	12	8	15	13	14	10	63
98-101	27-28	10	13	12			14	12	13		62
94-97	26				11	7				9	61
89-93	25	9	12	11			13	11	12		60
85-88	23-24		11		10	6	12	10	11	8	59
82-84	22	8	10	10			11				58
78-81	21		9		9		10	9	10	7	57
74-77	19-20			9							56
71-73	18	7	8		8	5	9	8	9		55
68-73	17						8				54
66-67	15-16		7	8				7	8	6	53
63-65	14	6			7						52
61-62	13						7				51
60	11-12		6	7				6	7		50
58-59	10						6			5	49
57	9	5			6						48
55-56	8		5	6					6		47
54	7							5			46
53	6						5				45
52											44
51	5				5						43
50	4			5					5		42
49											41
	3										40
48											39
47	2										38
46											37
	1										36
45	0										<36

SA–45® Female Nonpatient Profile

Name:_____ Age:____ Date:____/____/____

Female Adults

T	GSI	PST	ANX	DEP	OC	SOM	PHO	HOS	INT	PAR	PSY
>89	>215										25
89	213-215				25		25				
88	209-212							25			
87	204-208					25					24
86	197-203						24			25	
85	190-196				24			24			23
84	184-189	45	25				23		25		22
83	178-183			25	23	24		23		24	
82	172-177	44	23-24				22				20-21
81	166-171		22		22	23	21	22	24	23	19
80	160-165	43	21	24	21		20	21			18
79	154-159		19-20			22	19	20	23	22	17
78	148-153	42	18		20	21	18	19			16
77	141-147	41		23	19		17	18	22	21	15
76	135-140	40	17			20	16	17		20	14
75	129-134	39	16	22	18	19	15	16	21	19	13
74	124-128	38	15	21	17	18	14	15	20	18	12
73	119-123	37		20		17	13	14	19		11
72	115-118	35-36	14	19	16	16	12		18	17	
71	110-114	34			15		11	13	17	16	10
70	106-109	32-33	13	18		15	10	12	16	15	9
69	102-105	31		17	14	14	9	11	15		
68	98-101	29-30	12	16						14	8
67	95-97	28		15	13	13	8	10	14	13	
66	91-94	26-27	11	14	12	12		9	13		7
65	88-90	25		13			7		12	12	
64	84-87	24	10		11	11		8		11	
63	81-83	22-23		12					11		6
62	77-80	21	9	11	10	10	6		10	10	
61	74-76	20		10				7			
60	71-73	19				9			9	9	
59	69-70	17-18	8	9	9						5
58	67-68	16				8	5	6	8	8	
57	65-66	15		8	8						
56	63-64	14	7								
55	61-62	13		7		7			7	7	
54	59-60	11-12			7			5			
53	58	10									
52	57	9							6		
51	56		6	6		6				6	
50	54-55	8			6						
49	53	7									
48	52	6							5		
47				5							
46	51	5	5			5				5	
45	50	4									
44	49				5						
43	48	3									
42											
41	47	2									
40											
39	46										
38	45	1									
37											
36											
<36		0									

Female Adolescents

GSI	PST	ANX	DEP	OC	SOM	PHO	HOS	INT	PAR	PSY	T
>221											>89
220-221											89
218-219											88
216-217						25				25	87
213-215											86
211-212		25		25							85
207-210						24				24	84
203-206					25				25		83
196-202		24		24		23					82
193-197	45						25			23	81
188-192					24	22		25	24	22	80
184-187		23	25	23		21					79
179-183	44									21	78
175-178		22		22	23	20	24	24	23	20	77
170-174	43	21				19				19	76
166-169			24		22	18	23		22	18	75
161-165	42	20		21	21	17		23			74
157-160		19		20		16	22		21	17	73
152-156	41	18	23		20	15		22		16	72
148-151		17		19	19	14	21		20	15	71
143-147	40		22			13	20	21			70
138-142	39	16		18	18		19		19	14	69
134-137		15	21		17	12		20	18	13	68
129-133	38		20	17	16	11	18	19		12	67
125-128	37	14	19				17		17		66
121-124	36	13	18	16	15	10	16	18	16	11	65
117-120	35				14	9	15	17			64
113-116	34	12	17	15			14	16	15	10	63
109-112	33	11	16		13	8					62
106-108	32		15	14			13	15	14	9	61
102-105	30-31	10	14		12		12				60
99-101	29			13	11	7		14	13	8	59
95-98	28	9	13				11	13	12		58
92-94	27		12	12	10		10				57
88-91	25-26		11			6		12	11	7	56
85-87	24	8		11	9		9	11			55
82-84	23		10						10		54
79-81	21-22	7		10	8		8	10			53
75-78	20		9						9	6	52
72-74	19			9		5	7	9			51
70-71	17-18		8		7						50
67-69	16	6		8				8	8		49
65-66	14-15		7							5	48
63-64	13						6				47
61-62	11-12			7	6			7	7		46
59-60	10		6								45
57-58	9	5									44
56	8						5	6	6		43
55	7			6							42
53-54	6		5		5						41
52	5										40
51	4									5	39
50				5				5			38
49	3										37
	2										36
<49	<2										<36