## MENTAL HEALTH AND SEXUAL MINORITIES IN THE OHIO ARMY NATIONAL GUARD

By

# PHILIP KIT-MAN CHAN, MS

Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

Dissertation Advisor: Erika Trapl, PhD

**Department of Epidemiology and Biostatistics** 

CASE WESTERN RESERVE UNIVERSITY

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## CASE WESTERN RESERVE UNIVERSITY

## SCHOOL OF GRADUATE STUDIES

We hereby approve the dissertation of

## Philip Kit-Man Chan

Candidate for the Doctor of Philosophy degree\*.

(signed)

<u>Erika Trapl, PhD</u> (Chair of Committee)

## Joseph R. Calabrese, MD

Stephen J. Ganocy, PhD

## Henry Ng, MD, MPH

(date) <u>February 17, 2016</u>

\*We also certify that written approval has been obtained for any proprietary material contained therein.

## **DEDICATION**

This work is dedicated to:

My parents, William and Ivy, who worked tirelessly to ensure that I received the best education possible.

My grandparents who were always there when I needed them.

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## Mental Health and Sexual Minorities in the Ohio Army National Guard

Abstract

By

## PHILIP KIT-MAN CHAN

BACKGROUND: Among military personnel, mental health disorders are some of the most common and disabling medical conditions. Reports have suggested that National Guard soldiers are at an increased risk of developing psychiatric disorders as compared to active duty troops. Studies on sexual minorities within the U.S. military is limited and only recently have soldiers been allowed to serve openly regarding their sexual orientation.

PURPOSE: The purpose of this research was to document the prevalence of sexual minorities in the Ohio Army National Guard based on sexual identity, sexual behavior, and sexual attraction. From the information gathered on sexual minorities, associations were examined in regards to posttraumatic stress disorder, depression, and sexual violence. Furthermore, identify patterns of depression trajectories and determine if sexual minority status was a risk factor in depression trajectory membership.

METHODS: The data are derived from the Ohio Army National Guard Mental Health Initiative involving a sample of 1594 Ohio Army National Guard soldiers who were administered sexual orientation questions during Wave 5 of study administration. Logistics regression were used to examine associations between dimensions of sexual orientation and mental health disorders. Latent curve growth models were used to identify trajectories of depression.

RESULTS: Approximately 8.0% of the Ohio Army National Guard were considered a sexual minority. Sexual minorities were twice as likely to report lifetime depression after adjusting for demographic and military characteristics. Nearly 1 in 4 sexual minorities in the Ohio Army National Guard have reported lifetime sexual violence. Six trajectories of depression were identified and 62.9% of soldiers were resistant to depression across 6 years. Sexual minority status influenced group membership into the recovery and chronic dysfunction depressive groups.

CONCLUSIONS: This is the first military study to document the prevalence of sexual minorities across 3 dimensions of sexual orientation. The study results indicate feasibility in asking sexual orientation questions in a National Guard population and the need for thoughtful considerations on the operational definition of sexual minorities. The majority of sexual minorities in the Ohio Army National Guard are healthy, but there are a subset of vulnerable individuals within sexual minorities.

## INTRODUCTION

National Guard soldiers have endured a significant portion of the burden in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) and are projected to remain a major component of the overall fighting force into the future. National Guard soldiers face a unique set of circumstances relative to active duty troops that may place them at higher risk for psychiatric disorders and adjustment problems.

Some of the challenges the National Guard face include exposure to trauma in both military and civilian contexts as well as balancing of military and civilian responsibilities (Griffith, 2011). Other stressors they face include deployment without one's own unit, which is associated with lower unit cohesion and reduced social support (Griffith, 2011), family life and relationship difficulties (Vogt, Pless, King, & King, 2005; Vogt, Samper, King, King, & Martin, 2008; Werber, Harrell, Varda, Hall, & Beckett, 2009), in addition to uncertain employment status upon return (Werber et al., 2009). Additional stressors include the expectation of National Guard soldiers to have smooth post-deployment readjustment and rapid resumption of pre-deployment roles (Werber et al., 2009).

While National Guard soldiers face additional stressors relative to Active Duty soldiers, sexual minorities within the military may face even more stressors. Studies on sexual minorities within the U.S. military are limited as it was only recently on September 20, 2011, that the Don't Ask Don't Tell policy was repealed, allowing U.S. military members to serve openly regarding their sexual orientation without fear of being discharged. The few studies that exist on sexual minorities in the military are limited by their focus on the active army (Creel et al., 2013) or veterans (J. Blosnich, Foynes, &

Shipherd, 2013; J. R. Blosnich, Bossarte, & Silenzio, 2012; J. R. Blosnich, Mays, & Cochran, 2014; J. R. Blosnich & Silenzio, 2013; B. N. Cochran, Balsam, Flentje, Malte, & Simpson, 2013) instead of the National Guard. Furthermore, the focus has been on the perception, compatibility, and impact of lesbian, gay, and bisexual (LGB) soldiers on unit cohesion, readiness, and effectiveness (A. X. Estrada, Dirosa, & Decostanza, 2013; MacCoun, 1996; Moradi, 2009; Moradi & Miller, 2009). Additionally, questions assessing an individual's sexual orientation in both military and population research are limited due to the omission of such questions. Studies that have included sexual orientation questions have relied on two or fewer dimension of assessing sexual orientation, and sexual behavior.

Given the limited research on sexual minorities in both the general population and the military, there exists gaps in the literature that still need to be addressed. It is unclear how many individuals are considered a sexual minority and whether they are any different from their heterosexual counterparts. Our study builds upon the previous research as well as the minority stress model which is purported that sexual minorities living as a member of a stigmatized group are exposed to increased stressful life events which may impact mental health and well-being (Brooks, 1981; Meyer, 1995, 2003). It further extends prior research by examining all three dimensions of sexual orientation.

This dissertation was designed to inform future studies regarding the feasibility of collecting sexual orientation information on a military population as well as document the prevalence of sexual minorities in the Ohio Army National Guard. Furthermore, it seeks to document any differences between sexual minorities and their heterosexual

counterparts and how the operational definition of a sexual minority may impact data outcomes.

This dissertation is organized into nine chapters. The first chapter provides a background on the history of the National Guard, military exclusions of sexual minorities, and the recent repeal of military exclusions in the military. Chapter two encompasses details regarding the constructs of sexual orientation and the specific aims and significance of the dissertation research. The third chapter describes the methods, study population, and the history of the Ohio Army National Guard Mental Health Initiative. The fourth chapter describes each of the three manuscripts. The fifth through seventh chapters covering the results of the specific aims described in the second chapter. Chapter eight provides a synthesis of the study findings as well as the overall conclusions and recommendations for future research garnered from the information obtained from this dissertation research. The final chapter, chapter nine details additional techniques used to analyze the project in the sixth chapter.

## **CHAPTER 1: BACKGROUND AND SIGNIFICANCE** United States Armed Forces

The United States Armed Forces are composed of 5 military branches, which include the Army, Navy, Marine Corps, Air Force, and Coast Guard (Schading & Schading, 2006). Each branch of the military contains an active and reserve component. Within each reserve component, there are ready reserves, standby reserves, and the retired reserves. The President of the United States is the overall leader of the military and develops military policy with the help of the US Department of Defense (DoD). The DoD is a federal executive department which carries out military policy; it is headed by the Secretary of Defense who is the second in command of the military, appointed by the President and serves as the President's primary assistant on DoD-related matters (United States Code 10 USC § 113, 2006). The President and the Secretary of Defense are advised by a seven member Joint Chiefs of Staff, which includes the leaders of each military service branch and the chief of the National Guard Bureau.

The Reserve Components of the Armed Forces include the Army National Guard, Army Reserve, Naval Reserve, Marine Corps Reserve, Air National Guard, Air Force Reserve, and Coast Guard Reserve. The reserve components are referred collectively as the Guard and the Reserves. When comparing the National Guard and the Army Reserve, the difference is that the National Guard is under both state and federal control, whereas the Army Reserve is strictly under the control of the federal government. Within each Armed Force is a ready reserve, a standby reserve, and a retired reserve. The Ready Reserve includes the Selected Reserve. Most of the Ready Reserve serves in an active status (United States Census Bureau, 2012). Between 2006 and 2009, there were 1,088,465 to 1,156,308 active component members and between 819,318 to 1,041,542 reserve component members (United States Census Bureau, 2008, 2012). In 2008, there were a total of 1,080,617 members in the Ready and 19,298 Standby reserves, which does not include the 658,251 members of the Retired reserves. There are five Ready Reserve components of the US Armed Forces, including the 1. Army Ready Reserve (626,892), 2. Navy Ready Reserve (123,159), 3. Marine Corps Ready Reserve (95,748), 4. Air Force Ready Reserve (224,545), and 5. Coast Guard Ready Reserve (10,273). The previous totals include members of the National Guard for their respective branch (e.g. Army, Air Force). In terms of number of individuals in the National Guard and Reserves, Ohio ranks seventh out of the fifty states and the District of Columbia. As of 2009, there were 28,523 National Guard and Reserve in Ohio (United States Census Bureau, 2012).

### **United States Army**

The US Army is the largest branch of the US military and serves as the groundforce of the country. Its mission is to protect and defend the US by way of ground troops. The US Army is also the oldest branch of the military, officially established on June 14, 1775, by the Continental Congress to supplement local militias during the American Revolution. The US Army is supported by the Army Reserve and the Army National Guard. The difference between the Army Reserve and the Army National Guard is the management of its members. The Army Reserve is managed by the federal government whereas the National Guard is managed by each respective state. However, the US President or the Secretary of Defense can activate individual state National Guards into federal military service. The use of the Army Reserve and National Guard has increased since the Vietnam War. In times of war, the sequence for call up in the Army is as follows: 1. Regular Army, 2. Army Reserve, 3. National Guard, 4. Re-establishment of the draft, 5. Recall of previously discharged officers and enlisted who left honorably, 6. Activation of the state militias, and 7. Full-scale mobilization of the unorganized US militia. The mobilization of unorganized US militias involves all able-bodied males to be in the service of the Army (Schading & Schading, 2006).

There are several manners in which an individual can join the Army. They may enlist directly; join as an officer through the Reserve Officers Training Corps (ROTC) or US Military Academy, or through direct appointment. Individuals may join the active duty or reserve forces (Schading & Schading, 2006).

Active duty individuals are under a service commitment which ranges between two to six years and are considered full-time employment. The Army has specific duties termed Military Occupation Specialties (MOS), which range from active fighting positions, active support, to behind-the-scenes duties (Schading & Schading, 2006).

Individuals in the reserves are part-time employees of the federal government or state employee where soldiers have a civilian job while training near home. Training is usually one weekend a month with two weeks of annual training. Service commitments for the Army Reserves range from one to six years. A Reservist can be mobilized at any time for active duty. An Army Reserve soldier is considered activated when called to serve the Army full-time. Mobilization involved reporting to duty when the soldier receives orders. Once Army Reservists are activated, they serve a maximum of two years, unless extended by war. Deployment is when active duty soldiers are moved to a

specific area of operations, usually on foreign soil. Army Reserve soldiers who are activated or deployed receive the same compensation as active duty soldiers of the same rank and under federal law reservists who are mobilized cannot lose their civilian job (Schading & Schading, 2006).

The Army Reserve is composed of the Selected Reserves, the Individual Ready Reserves, and the Retired Reserves. The Selected Reserves are the most easily accessible group and are composed of Troop Program Units, Active Guard and Reserve Soldiers, and Individual Mobilization Augmenters. Troop Program Units generally train on weekends and once annually. Individual Mobilization Augmenters are assigned to highlevel headquarter jobs where they would serve if mobilized and usually train for two weeks annually (Schading & Schading, 2006).

Individuals belonging to the Individual Ready Reserves are trained soldiers who may be called to replace soldiers in Active and Army Reserve Units. Individual Ready Reserve personnel who may have recently left Active Duty still have an Army Reserve Commitment (Schading & Schading, 2006).

The Retired Reserve are composed of retirees from the Army, which includes the Active Army, Army Reserve, and Army National Guard. These members remain part of the Army Reserve family after retirement (Schading & Schading, 2006).

In order to enlist, soldiers must be between the ages of eighteen and thirty-four, with the exception of being seventeen with parental permission. Furthermore, individuals must be high school graduate or equivalent, and must take the Armed Services Vocation Aptitude Battery (ASVAB), which is the general aptitude exam for all military service. In addition, other tests are given to ensure the individual is mentally, physically, and morally capable of enlisting in the service. Individuals who have received special training, such as medical or dental, may join the Army through direct appointment (Schading & Schading, 2006).

The US Army must train its soldiers to prepare them for their roles in the Army. Basic Combat Training (Boot Camp or BT) is a nine-week training program. The goal of BT is to train the new recruits into soldiers capable of fighting, following orders, and working as a team. Recruits begin as privates (PVT) and graduate BT to become private first class (PFC) (Schading & Schading, 2006).

## **United States National Guard**

The United States National Guard is part of the reserve component of the United States Armed Forces and composed of citizen-soldiers and airmen assigned to the Army National Guard (ARNG) and the Air National Guard (ANG) respectively. It is composed of National Guard units or members from each of the 50 states and the District of Columbia as well as the US territories of Guam, Virgin Islands, and Puerto Rico for a total of 54 separate organizations. The National Guard is a unique in that is serves both the state and the federal government. During times of peace, the Guard serves the Governor of their respective state to preserve life and protect property. In times of war and national emergencies, the President of the United States can call upon the ARNG and ANG to active duty, where they serve as federal reserves to the Army and Air Force respectively (Doubler, 2001, 2008; Doubler & Listman, 2003).

The National Guard has two different chains of command due to its dual status in serving both the state and the federal government. The governor of the respective states

and territories serves as the commander in chief of the Guard during times of peace. The adjutant general in each state and territory and the commanding general of the District of Columbia National Guard are responsible for the conduct, stationing, and administration of Guard forces in peacetime. The adjutant general handles the Joint Force Headquarters (JFHQ), a staff that handles the deployment of Guard troops on state active duty as well as the mobilization and demobilization of soldiers entering and returning from the federal reserves. Once the civilian-soldiers and airmen are deployed they are no longer under state control, instead they are responsibility of the major Army or Air Force command (Doubler, 2001, 2008; Doubler & Listman, 2003).

The overall administration of the National Guard is with the National Guard Bureau (NGB) in Washington D.C. The NGB serves as the liaison between the states and the departments of the Army and Air Force regarding all matters related to the National Guard. The NGB's role expanded after the September 11th attacks on the World Trade Center in New York in 2011. The NGB is now also responsible for providing situational awareness on National Guard matters which affect homeland defense and defense support to civil authorities to the Office of the Secretary of Defense, the Joint Chiefs of Staff in the Pentagon, as well as the overseas combatant commanders (Renaud, 2005). The NGB is organized to function as both a staff and an operating agency. As a staff agency, the NGB serves the function of developing and coordinating training programs for the National Guard. As an operating agency, the NGB administers the programs required for the training, development, and maintenance of Guard units and informs the states (Doubler, 2008).

The chief, NGB, is a National Guard general officer appointed by the president with Senate approval, and obtains the rank of lieutenant general and serves a four-year term with the possibility of a second four-year term. The chief, NGB, possesses extensive administrative, budgetary, and advisory powers. Furthermore, the chief, NGB, is the principal adviser to the chief of staff and the secretary of the Army and to the chief of staff and secretary of the Air Force on matters relating to the National Guard. The Directors of the ARNG and ANG assists the chief, NGB, in the administration of their respective forces (Doubler, 2001, 2008; Doubler & Listman, 2003).

The ARNG is the largest reserve component in the reserve forces and acts as the primary combat reserve to the US Army. The ARNG comprises approximately one-third of the entire Army. A majority of the ARNG is assigned to eight combat divisions, seventeen brigades, two Special Forces (SF), and hundreds of support units. 52% of the ARNG are in combat units, 39% in combat support combat service support organizations, and 9% as Active Guard Reserves (AGR) in command and staff positions (Doubler, 2001, 2008; Doubler & Listman, 2003).

## Military Mental Health Screening

In order to enlist in one of the five branches of the US Military including the Guard and Reserves, an aptitude test, Armed Services Vocation Aptitude Battery (ASVAB) must be completed. Other tests are also given to ensure the potential candidate is mentally, physically, and morally capable of service (Schading & Schading, 2006). During the review process of the potential candidate, military officials review the medical records of potential service members for their mental health history which may include past diagnoses, past treatments, or other indicators of behavioral problems. Documented cases of past suicide attempts, mood disorders such as depression or bipolar disorder, as well as drug abuse may preclude an individual from gaining admittance to the military (Nakashima, 2011).

Once a service member is enlisted, they are prone to frequent mental health evaluations before and after deployment. Military personnel returning from Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) receive education on depression and PTSD prior to deployment and are screened 90 to 120 days postdeployment using the Post-Deployment Health Re-Assessment (PDHRA) (Deployment Health Clinical Center).

### United States National Guard History

National Guard, 1903 - 1916

The first federally funded joint maneuvers of the National Guard and the Regular Army occurred in 1904. 90,000 magazine rifles and new field pieces were issued by the War Department to the National Guard artillery batteries. By 1911, National Guard organizations created standard units of infantry, field artillery, coast artillery, cavalry, engineers, and signals. New armories were being requested with the flood of new arms and equipment for the National Guard, but no federal money was allocated for armories. The states, counties, and towns pooled money to build armories to fulfill the need for property accountability and maintenance of the new equipment received by the Guard. By the end of 1916, the National Guard had grown to 132,194 soldiers (Doubler, 2001, 2008; Doubler & Listman, 2003). In 1908, amendments to the Militia Act were enacted. The time and geographic limits for the Guard service disappeared, which were initially within the US boundaries. In addition, the law specified that the National Guard would go to war as units and not individual replacements. Within the War Department, a Division of Militia Affairs was created. The staff division was staffed with Regular officers who were responsible for the administration of the Guard. By 1911, the Division of Militia Affairs was the direct control of the Army chief of staff, and Congress elevated the division head position to the rank of general officer (Doubler, 2001, 2008; Doubler & Listman, 2003).

In 1915, the Guard saw its first flying unit from the New York National Guard. Private Beckwith Havens was the first Guard Aviator in 1911 to fly a Curtis aircraft. New York activated the first Aero Company in 1915, followed by a second company in Buffalo the following year. During that time, Ohio, California, and Michigan began organizing flying units and obtaining pilot ratings. Lieutenant Colonel Charles B. Winder of Ohio was the first Guard officer to obtain a Reserve Military Aviator rating on May 22, 1912 (Doubler, 2001, 2008; Doubler & Listman, 2003).

#### National Defense Act of 1916

The passing of the National Defense Act of 1916 designated the National Guard as the Army's primary reserve as well as authorizing the expansion of the Regular Army and Army Reserve. The National Defense Act resulted in the elimination of all state militias; instead all state units would be designated as National Guard. The president received authority to mobilize National Guard troops for the entire duration of national emergencies. The National Defense Act also increased the training periods for the National Guard soldiers. The initial twenty-four annual drill periods increased to fortyeight with pay and the summer camp was extended from five to fifteen days. The Guard units also received formal federal recognition after achieving specified manning and equipment levels (Doubler, 2001, 2008; Doubler & Listman, 2003).

National Guard in World War I

With America's declaration of war on Germany on April 6, 1917, combat power was needed. Initial combat power from America came from the National Guard. By August 5, 1917, all 379,701 Guardsmen in sixteen divisions were on active duty at mobilization camps training and organizing for combat (Doubler, 2001, 2008; Doubler & Listman, 2003).

At the beginning of World War I, there were 100 qualified Guard pilots. There were no National Guard aviation units that went to war, however made other contributions such as the establishment of training centers in Europe for American fliers as well as filling important aviation staff positions (Doubler, 2001, 2008; Doubler & Listman, 2003).

By the end of World War I in November 1918, 433,478 National Guardsmen had served. Of the forty-three American divisions sent to France, eighteen of them were from the National Guard. The National Guard suffered 103,721 men killed and wounded, which is approximately 43 % of American casualties (Doubler, 2001, 2008; Doubler & Listman, 2003). National Defense Act of 1920

The National Defense Act of 1920 rejected the notion of having a large Regular Army backed by a large pool of trained reserve forces. Instead, it opted for a smaller active force supplemented by National Guard and Organized Reservists. The active Army was permitted 280,000 soldiers and assigned the duties of defending overseas possessions, expeditionary duties, and border protection. The Organized Reserves would provide officers in wartime and manage nine reserve divisions during national emergencies. The National Defense Act of 1920 designated the National Guard as the first Federal Reserve force and set Guard strength at a maximum of 435,000 soldiers. Furthermore, the chief of the Militia Bureau was to be a National Guard general officer in the War Department. The law also stipulated that Guard officers would serve on the general staff and establish a committee of senior Guard officers to review and recommend policies affection the entire National Guard (Doubler, 2001, 2008; Doubler & Listman, 2003).

In 1933, an important amendment was added to clarify the role of the National Guard. Thirty Years since the Militia Act of 1903, many were still confused regarding the Guards dual role as both a state and federal force. The 1933 act designated the "National Guard of the United States" as the permanent reserve component of the Army consisting of federally recognized National Guard units and the president retained the power to deploy these units during a national emergency. Furthermore, the act established the "National Guard of the several States" which was primarily composed of voluntary members of the state militias that serve under the governors. The legislation

also changed the name of the Militia Bureau to the National Guard Bureau (NGB) (Doubler, 2001, 2008; Doubler & Listman, 2003).

### National Guard, World War II

The National Guard's ground and air units played important roles in America's victory in World War II. They proved to be a ready standing force that could deploy immediately. Without the Guard, the initial ground forces for the Americans may have taken years instead of a few rapid months (Doubler, 2001, 2008; Doubler & Listman, 2003).

The National Security Act of 1947 reorganized America's defense departments by creating a new Department of Defense that unified the armed forces into the Army, Navy, and Air Force. The ANG was created in 1947 and the modern NGB headquarters was created on October 1, 1948 (Doubler, 2001, 2008; Doubler & Listman, 2003).

As World War II came to an end, the War Department decided that the Guard should resume its traditional place in national defense and remain as America's first line of defense and retain its unique dual status. By 1950, the ARNG reached its peak strength with 325,000 soldiers and the ANG with 45,000 airmen (Doubler, 2001, 2008; Doubler & Listman, 2003).

#### Modern Day National Guard

Since World War II, US reservists have served intermittently for "one weekend a month, two weeks a year." However, this slogan, used by the United States Army National Guard has not been used recently due to increased time commitments due to

Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) in which the slogan does not represent the actual time commitments (Carafano, 2005). Time commitments increased as a result of additional drill preparation (US Department of Veterans Affairs, 2012). OEF began on October 7, 2001 with air strikes on al Qaeda targets, which the US linked to the September 11, 2001 attacks on the United States (Cable News Network, 2015). OIF was launched on March 20, 2003 by the Bush Administration to remove the Iraqi regime under Saddam Hussein and various insurgent groups (Dale, 2011).

The first shift of US reserve component being treated more like their active military counterparts occurred during the First Gulf War or Operation Desert Storm (ODS) which occurred from August 1990 until February 1991. This was due to the passage of the 'Total Force' policy by Melvin Laird, who was the secretary of defense at that time (Carafano, 2005). With the passage of the policy, it resulted in a smaller active duty force, which reduced costs that would be associated with maintaining a larger active force.

The new policy was not tested until ODS, in which US reservists were called for a wartime mission. (Bonds, Baiocchi, & McDonald, 2010). During ODS, it was reported that many Army Reserve Components had personnel on their rosters, although they were not attending drills. These individuals were referred to as 'ghosts' and the main purpose was to keep units staffed to meet requirements as well as preventing the loss of federal funding and unit allocations (Kirby & Buddin, 1996; Orvis, Shukiar, McDonald, Mattock, & Kilburn, 1996). Regulations instructed that individuals were to be dropped from the list after missing 9 drills. Individuals that were in units were lacking training

(job and combat preparation) as well as not having met physical and medical requirements (Allen, 1992; Operation Desert Storm: Army Guard combat brigade war lessons reflect longstanding problems, 1992). These findings were further confirmed by Griffith who reported that soldiers lacked necessary job and combat preparations, unit leadership, and collecting training. It was also reported by junior-ranking officials that there was a need for non-commissioned officer (NCO) as well as officer leadership. The general perception was that unit leaders, specifically officers, were not trusted and were seen not caring about the soldiers (Griffith, 1995).

Another area of concern for reservists during ODS, which was the lack of expectations and information for soldiers for being active and deployed. Many reservists joined because of education benefits, which did not include long term deployments (Schmitz, 1990). Junior-ranking officials reported problems with civilian employers and unfavorable attitudes from family as a result of the extended call-ups and separation from family and employers (Griffith, 1995).

The experiences of OIF and OEF reservists are slightly different as compared to reservists from ODS. With OIF and OEF, there have been many more reservists being called to active duty, where nearly 500,000 of the 1.2 million US reservists have been mobilized and deployed (Bonds, et al., 2010). Many of the inadequacies reported during the First Gulf War were remedied by 2003 when the first large scale military operations began in Iraq due to increased time for preparation and the deployment of special support forces before the utilization of large scale military forces after the attacks on the World Trade Center in 2001 (Griffith, 2005). The same study also showed that there were more soldiers who were duty qualified than ODS as well as more deployed soldiers were

qualified for their positions. However, other studies have shown during the same period (late 2003), pointed out problems in the number of soldiers being adequately trained and available for mobilization (Office & Personnel, 2003; St Laurent, 2004). This in turn resulted in a practice known as 'cross-leveling,' where reserve soldiers were reassigned in small groups or individually to other units which were often led by active duty personnel (Griffith, 2011). Shortages in personnel also contributed to the practice. Such practice could negatively affect unit cohesion as well as increased stress (Griffith, 1989). Furthermore, OEF and OIF resulted in uncertainties of length and number of deployments. It resulted in more frequent call-ups of the reserve forces with ambiguous deployment lengths (Gilmore, 2007).

### Ohio National Guard

The Ohio National Guard maintains a presence in 54 of Ohio's 88 counties and as of 2016 is currently under the command of the Adjutant General, Major General Mark E. Bartman who reports to the Ohio Governor, John Kasich. Major General Mark Bartman assumed the duties of the Adjutant General of the Ohio National Guard, Joint Force Headquarters in Ohio on January 10, 2015. He is a member of the Governor's cabinet and is responsible for the command of the Ohio National Guard and the military readiness of the Ohio Militia. The Ohio National Guard consists of the Ohio Army National Guard, Ohio Air National Guard, Ohio Military Reserve, and Ohio Naval Militia, totaling more than 17,000 personnel. General Barman supervises four flag officer heads of these components and four deputy directors in the day-to-day operation and management of the readiness, fiscal, personnel, equipment, and real property resources of the agency (Ohio National Guard, 2016)

The previous Adjutant General was Major General Deborah Ashenhurst who assumed the duties of Adjutant General of the Ohio National Guard, Joint Force Headquarters in Ohio from January 10, 2011 to January 10, 2015. She was the first female adjutant general of the Ohio National Guard and is now a special assistant to the vice chief at the National Guard Bureau. (Ohio National Guard, 2014).

# Lesbian, Gay, Bisexual, and Transgender (LGB) Community within the National Defense

There are an estimated 9 million US adults who self-identify as lesbian, gay, bisexual and transgender (LGB) (G. J. Gates, 2011). Data from Census 2000 estimates that nearly one million Americans are LGB veterans. Estimates from Census 2000 and more recently 2008 General Social Survey suggests that approximately 36,000 to 48,500 LGB are serving in active duty or ready reserves, which represents 2.2 to 2.5 % of active duty personnel. When the guard and reserve components are included, nearly 65,000 to 71,000 men and women are likely to be LGB, which accounts for 2.8 % to 3.4 % of military personnel (J. A. Davis, 2009; G. Gates, 2004, 2010; G. J. Gates, 2010).

Data from Census 2000 and 2008 General Social Survey suggests that lesbians and bisexual women are more likely to serve in the military than are gay or bisexual men or heterosexual women. Estimates show that approximately 2.9% women on active duty are lesbian or bisexual as compared to 0.6% of men. Furthermore, data indicates that LGB men and women are more common among those in the guard and reserve (3.4%) than those on active duty (0.9%) (J. A. Davis, 2009; G. Gates, 2010). LGB individuals belong to a sexual minority which experiences unique health disparities. During a time when LGB individuals are an increasingly visible part of society, clinicians and researchers are faced with incomplete health information on this community. A commonality across LGB individuals is their historically marginalized social status relative to society's cultural norms. For some members of the LGB community, this stigma may be further compounded by race, ethnicity, socioeconomic status, and occupation (Institute of Medicine, 2011).

LGB service members have served and continue to serve in all branches of the military (Bérubé, 2010; Shilts, 1993). Until recently, LGB service personnel did not disclose and even lied about their sexual orientation due to the National Defense Authorization Act, a military exclusionary policy better known as Don't Ask, Don't Tell (DADT), which changed expulsion on the basis of sexual orientation to sexual behavior. (10 USC § 654). While serving under DADT, the policy created unique stressors for LGB service members which include, but not limited to, discrimination, harassment, and fear of discharge (B. N. Cochran et al., 2013; A. X. Estrada et al., 2013). Discharges continued until September 20, 2011, when the US military allowed LGB service members to serve openly (Belkin et al., 2012). An important note on the repeal of DADT is that it does not specifically address transgender individuals, as their status may be treated as a mental illness, which is considered a medical exclusion according to military medical service standards (Army Medical Services, 2007).

## **Evolving Role of the Reserve Component**

Since World War II, the Reserve component within DoD have served intermittently for one weekend a month, two weeks a year. However, the United States Army National Guard has recently increased time commitments due to Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) in which the slogan "one weekend a month, two weeks a year" does not represent the actual time commitments (Carafano, 2005).

The first shift of US Army reservists being treated more like their active military counterparts occurred during the First Gulf War or Operation Desert Storm (ODS). This was due to the passage of the 'Total Force' policy by Melvin Laird, who was the secretary of defense at that time (Carafano, 2005). With the passage of the policy, it resulted in a smaller active duty force, which reduced costs that would be associated with maintaining a larger active military force.

The new policy was not tested until ODS, in which US reservists were called for a wartime mission. (Bonds, Baiocchi, & McDonald, 2010). During ODS, it was reported that many Army Reserve Components had personnel on their rosters, although they were not attending drills. These individuals were referred to as 'ghosts' and the main purpose was to keep units staffed to meet requirements as well as preventing the loss of federal funding and unit allocations (Kirby & Buddin, 1996; Orvis, Shukiar, McDonald, Mattock, & Kilburn, 1996). Regulations instructed that individuals were to be dropped from the list after missing 9 drills. Individuals that were in units lacked training (job and combat preparation) as well as not meeting physical and medical requirements (G. W. Allen, 1992; General Accounting Office, 1992). These findings were further confirmed

by Griffith who reported that soldiers lacked necessary job and combat preparations, unit leadership, and adequate training. It was also reported by junior-ranking officials that there was a need for non-commissioned officer (NCO) as well as officer leadership. The general perception was that unit leaders, specifically officers, were not trusted and were seen not caring about the soldiers (Griffith, 1995).

Another area of concern for reservists during ODS, which was the lack of expectations and information for soldiers for being active and deployed. Many reservists joined because of education benefits, which did not include long term deployments (Schmitz, 1990). Junior-ranking officials reported problems with civilian employers and unfavorable attitudes from family as a result of the extended call-ups and separation from family and employers (Griffith, 1995).

The experiences of OIF and OEF reservists are slightly different as compared to reservists from ODS. With OIF and OEF, there have been many more reservists being called to active duty, where nearly 500,000 of the 1.2 million US reservists have been mobilized and deployed (Bonds et al., 2010). Many of the inadequacies reported during the First Gulf War were remedied by 2003 when the first large scale military operations began in Iraq due to increased time for preparation and the deployment of special support forces before the utilization of large scale military forces after the attacks on the World Trade Center in 2001 (Griffith, 2005). The same study also showed that there were more soldiers who were duty qualified than ODS as well as more deployed soldiers were qualified for their positions. However, other studies have shown during the same period (late 2003), pointed out problems in the number of soldiers being adequately trained and available for mobilization (Office & Personnel, 2003; St Laurent, 2004). This in turn

resulted in a practice known as 'cross-leveling,' where reserve soldiers were reassigned in small groups or individually to other units which were often led by active duty cadre(Griffith, 2011). Shortages in personnel also contributed to the practice. Such practice could negatively affect unit cohesion as well as increased stress (Griffith, 1989). Furthermore, OEF and OIF resulted in uncertainties of length and number of deployments. It resulted in more frequent call-ups of the reserve forces with ambiguous deployment lengths (Gilmore, 2007).

Reserve component members have borne a significant portion of the burden in OIF and OEF, accounting for more than one-quarter of all deployments, and are projected to remain a major component of the overall fighting force into the future. National Guard soldiers face a unique set of circumstances relative to active duty troops that may place them at higher risk of psychiatric disorders and adjustment problems. Studies have suggested that Guard and Reserve soldiers are more vulnerable to post-deployment psychopathology compared to active duty soldiers due to the strain of returning to their civilian responsibilities and receiving less support from military peers (Keane, Marshall, & Taft, 2006; D. W. King, King, Foy, Keane, & Fairbank, 1999).

Some of the challenges reserve component members face include exposure to trauma in both military and civilian contexts; balancing of military and civilian responsibilities; deployment without one's own unit, which is associated with lower unit cohesion and reduced social support (Griffith, 2011); family life and relationship difficulties (Vogt et al., 2005; Vogt et al., 2008; Werber et al., 2009); uncertain employment status upon return (Werber et al., 2009); and expectations of a smooth postdeployment readjustment and rapid resumption of pre-deployment roles (Werber et al.,

2009). Recent studies indicate that relative to Active Duty soldiers, National Guard and Reserve component soldiers have higher risk of prevalent alcohol use disorders (Jacobson et al., 2008; Santiago et al., 2010) and post-deployment interpersonal conflict (Milliken, Auchterlonie, & Hoge, 2007). Less is known about depression and the contribution of military and civilian (Goldmann et al., 2012) experiences in its etiology, although a recent study found that active duty women had slightly higher risk relative to reserve component women (Wells et al., 2010). Although a number of studies have examined the relative influence of military and civilian experiences upon psychological health and resilience, most studies have been cross-sectional, and few have examined a comprehensive set of predictors in the same analysis.

#### Prevalence of Mental Health Since Vietnam War

Among military personnel, mental health disorders are some of the most common and disabling medical conditions (C. W. Hoge et al., 2004). It has been reported that the prevalence of mental health disorders are higher in military populations than the general population (C. W. Hoge et al., 2004; Kessler, Berglund, et al., 2005; Kessler, Chiu, Demler, Merikangas, & Walters, 2005; K. H. Seal, Bertenthal, Miner, Sen, & Marmar, 2007). Moreover, reports have suggested that National Guard Members are at a higher risk of developing psychiatric disorders than active duty troops (Milliken et al., 2007; Polusny et al., 2009; United States Army Surgeon General, 2006).

Service members who have returned from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) have shown a significant burden of mental health and adjustment problems. Exposure to a range of potentially traumatic events is a common experience among military forces (Charles W Hoge, Auchterlonie, & Milliken, 2006; C. W. Hoge et al., 2004; Tanielian & Jaycox, 2008) and civilians alike (Breslau et al., 1998). Estimates of PTSD among those who served in OIF and OEF range from about 5-20%,(Kok, Herrell, Thomas, & Hoge, 2012; Ramchand et al., 2010; T. C. Smith et al., 2008; Tanielian & Jaycox, 2008) while estimates of depression range from 2-16% (Tanielian & Jaycox, 2008; Wells et al., 2010). Patterns of alcohol misuse are less clear, although recent screening estimates suggest that 20-33% of soldiers engage in hazardous drinking (Robert M Bray et al., 2009; R. M. Bray et al., 2010). In comparison, estimates of PTSD related to combat service in Vietnam range from a current diagnosis of 2-9% to approximately a lifetime diagnosis of 15-19% (Destefano, 1988; Dohrenwend et al., 2006), with similar rates among those who served in the Gulf War (Kang, Natelson, Mahan, Lee, & Murphy, 2003; Orcutt, Erickson, & Wolfe, 2004). Estimates of depression among those who served in Vietnam range from 2.8 to 4.5 % current to 5 to 12 % lifetime (Destefano, 1988; Jordan et al., 1991), while alcohol use disorders (including abuse and/or dependence) were the most common problem among soldiers of the Vietnam war, ranging from 2.4%-14% current to 40% lifetime (Destefano, 1988; Jordan et al., 1991).

#### Psychopathology in the Military

There is little question that there is much to be learned through the longitudinal study of mental health among service members. Cross-sectional prevalence and incidence estimates of mental health problems can inform assessments of populationlevel burden of disease at a given point in time, but tell us little about the course and consequences of trauma exposure across the deployment cycle. The study of trajectories of mental health, following exposure to trauma, has emerged as an important area of study in the past decade (Bonanno, 2004; Norris, Tracy, & Galea, 2009), with much of the literature focused on the concept of resilience. Norris and colleagues (Norris et al., 2009) noted that "there is growing consensus that resilience is better characterized as adaptability than as stability," and that "resilience is a process of bouncing back from harm rather than immunity from harm." While a variety of trajectories have been hypothesized, evidence from exposure to man-made and natural disasters appears to most strongly support trajectories of (a) resilience, (b) resistance, (c) recovery, (d) chronic dysfunction, and (e) delayed dysfunction (Norris et al., 2009). Among soldiers deployed in support of OEF and OIF, one recent analysis found that approximately 83-85 % demonstrated trajectories of resilience, while approximately 5-7% experienced delayed dysfunction (Bonanno et al., 2012). Although this study was longitudinal in nature, and accounted for pre-deployment characteristics, a three-year gap between interview timepoints limits the granularity and specificity of observable patterns. While some work has been done to characterize distinct trajectories for depression symptoms (Nandi, Tracy, Beard, Vlahov, & Galea, 2009) and alcohol use (Cerda, Vlahov, Tracy, & Galea, 2008) following the September 11<sup>th</sup> attacks, most prior work on trajectories of mental health and resilience have focused on posttraumatic stress.

#### Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) first appeared in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric

Association, 1980). However, accounts of what we know today as PTSD are much older. Often, it has been linked to a history of war as well as civilian settings after mass casualties and natural disasters. The concept of "shell shock" was introduced after the horrors of trench warfare during World War I. It was initially thought that exposure to intense artillery caused "shell shock", but clinicians later realized it was due to the stress of the combat experience (Andreasen, 2011).

During World War II, soldiers were experiencing symptoms of anxiety and reliving memories of war which may be a result of stimuli that was reminiscent of the original trauma (Grinker & Spiegel, 1944). This syndrome was given a variety of names such as: traumatic war neurosis, combat fatigue, battle stress, and gross stress reaction (Kral, 1951).

PTSD is unique due to the great importance that is placed on the etiological agent, the traumatic stressor. A PTSD diagnosis cannot be made without the individual being exposed to a traumatic event (M. Friedman, 2007). Although there exists a clear and compelling relationship between trauma exposure and the development of PTSD, not all individuals exposed to trauma have enduring symptoms of PTSD (Kulka et al., 1990; Wolfe, Keane, Kaloupek, Mora, & Wine, 1993). Studies on resiliency factors of PTSD include hardiness, post-deployment social support, and other positive life events during the post-war period (L. A. King, King, Fairbank, Keane, & Adams, 1998).

Community based studies on mental illness suggest that people with a PTSD compared to those without the disorder are more likely to have another psychiatric condition and few of those with PTSD have this condition alone (Brady, Killeen, Brewerton, & Lucerini, 2000; Breslau, 2009; Kessler, Sonnega, Bromet, Hughes, &
Nelson, 1995; Kulka et al., 1990). The NCS reported 20.9 % of women with same-sex partners reported a 12-month prevalence of PTSD as compared to women with opposite-sex partners. However, in men, current PTSD rates were higher for men with opposite-sex partners as compared to men with same-sex partners, 2.2 % and 1.3 % respectively (Gilman et al., 2001). The relationship between risk and resilience factors of PTSD is complex and there exists a need to evaluate this relationship in non-treatment seeking veterans as well as those who belong to a sexual minority in the military.

## Depressive Disorder

Depression is a serious and burdensome mental health disorder which is associated with higher rates of chronic disease, increased health care utilization, and functional impairment (Katon, 2003). Approximately, 6.6%-7.6% of Americans aged 18 and over has depression in a given year (Center for Behavioral Health Statistics and Quality, 2015; Kessler, Chiu, et al., 2005; Pratt & Brody, 2014).There are several types of depressive disorder, which include major depressive disorder, persistent dysthymia, and bipolar disorder (National Institute of Mental Health, 2003). Within these types there are variations on the number of symptoms, severity and persistence. Other mental health conditions such as PTSD, obsessive-compulsive disorder, panic disorder, social phobia, substance use disorders, and generalized anxiety disorder typically co-occur with depression (Devane, Chiao, Franklin, & Kruep, 2005; Regier, Rae, Narrow, Kaelber, & Schatzberg, 1998).

Major depression, also known as major depressive disorder, is manifested by a combination of symptoms which results in the interference of a person's ability to work,

study, sleep, eat and enjoy once pleasurable activities. Symptoms of depression include: 1. persistent sad, anxious or empty mood, 2. Feelings of hopelessness or pessimism, 3. Feelings of guilt, worthlessness or helplessness, 4. Loss of interest or pleasures in hobbies or activities, 5. Decreased energy or fatigue, 6. Difficulty concentrating, remembering or making decisions, 7. Trouble sleeping, early morning wakening, or oversleeping, 8. Thoughts of death or suicide or suicide attempt, 9. Restlessness or Irritability, 10. Persistent physical symptoms headaches, digestive, and chronic pain which does not respond to treatment. A major depressive episode can occur once or a series over the course of a lifetime (National Institute of Mental Health, 2003).

Dysthymia, or dysthymic disorder, is a less severe form of depression. It involves long-lasting symptoms which do not prevent a person from functioning well or feeling good. Like individuals with major depressive disorder, individuals with dysthymia also experience a major depressive episode during some point in their life (National Institute of Mental Health, 2003).

Another type of depressive disorder is bipolar disorder, which is characterized by the cycling of severe high and low moods with periods of normal mood in between. When in the depressed mood state, a person can have any or all the symptoms of depression. In the manic cycle, the person may be overactive, over-talkative, and have great amounts of energy. Symptoms of mania include: 1. Abnormal or excessive elation, 2. Unusual irritability, 3. Decreased need for sleep, 4. Grandiose notions, 5. Increased talking, 6. Racing thoughts, 7. Increased sexual desire, 7. Markedly increased energy, 8. Poor judgment and 9. Inappropriate social behavior. Mania affects thinking, judgment

and social behavior which may cause problems (National Institute of Mental Health, 2003).

During military deployment, depression has been one of the most common complaints (Winfield & Lafferty, 1997). However, more studies have been carried out on posttraumatic stress disorder (PTSD) in US military personnel who have served in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) (Bryan & Heron, 2015; Wells et al., 2011). In contrast, depression has received less attention than PTSD in OIF and OEF military personnel (Bryan & Heron, 2015; Gadermann et al., 2012). Prevalence of depression among OIF and OEF veterans range from 2-24% (Elbogen et al., 2014; Gadermann et al., 2012; C. W. Hoge et al., 2004; Karen H Seal et al., 2009; Tanielian & Jaycox, 2008; Thomas et al., 2010; Wells et al., 2010). It has been documented that exposure to stressful life events has been associated with depression (Monroe & Hadjiyannakis, 2002). Depression is a great concern to the military as it has been associated with suicide (Holmes, Mateczun, Lall, & Wilcove, 1998). A study conducted by Hoge et al., 2004, show that 11.4% of active duty soldiers and Marines were depressed before deployment and it rose to 15% after deployment.

#### Sexual Assault

11% to 25% of American women report experiencing an attempted or completed rape in their lifetime (Basile, Chen, Black, & Saltzman, 2007; Fisher, Cullen, & Turner, 2000; Tjaden & Thoennes, 2000b). Among American men, approximately 3% to 4% have reported an attempt or completed rape during adulthood (Elliott, Mok, & Briere, 2004; Tjaden & Thoennes, 2000a). There are fewer studies of military sexual assaults

(MSA) as compared to studies on general sexual assault in the general population (Turchik & Wilson, 2010). Sexual violence contributes to psychopathology and the most commonly reported mental health conditions are post-traumatic stress disorder (PTSD) and depression (Darves-Bornoz et al., 2008; Elliott et al., 2004; Hapke, Schumann, Rumpf, John, & Meyer, 2006; Kaminer, Grimsrud, Myer, Stein, & Williams, 2008). Research on MSA provides and emphasizes the need for improved training and prevention programs.

Military sexual assaults are the same or higher than the ones reported in the general population. The Department of Veterans Affairs uses the term military sexual trauma (MST) to refer to sexual assaults and harassment that occurred to the individual in the military (Lawhorne-Scott, Philpott, & Scott, 2014). Women report 9.5% to 33% of experiencing an attempted or completed rape while serving in the military (Bostock & Daley, 2007; Coyle, Wolan, & Van Horn, 1996; Murdoch, Pryor, Polusny, & Gackstetter, 2007; Sadler, Booth, Nielson, & Doebbeling, 2000; K. M. Skinner et al., 2000; Surís, Lind, Kashner, & Borman, 2007). Few studies have gathered prevalence rates on male victims of MSA. Studies report 0.7% to 12% of men in the military reported sexual assault (Kimerling, Gima, Smith, Street, & Frayne, 2007; Kimerling et al., 2010; Krinsley, Gallagher, Weathers, Kutter, & Kaloupek, 2003; Martin, Stretch, Rosen, Knudson, & Durand, 1998; Murdoch, Polusny, Hodges, & O'Brien, 2004; Murdoch et al., 2007; D. W. Smith, Frueh, Sawchuk, & Johnson, 1999). A recent report from the Defense Department estimated that 26,000 sexual assaults took place during fiscal year 2012 in the armed forces, results from its anonymous sexual abuse survey. 6.1% of women and 1.2% of men claimed to have suffered sexual abuse. With an active-duty

force of 200,000 women and 1.2 million men, the percentages equate to 12,000 female victims and 14,000 male victims (Defense, 2012a, 2012b).

## Sexual Violence

The issue of unwanted sexual experiences is a pervasive problem in both United States (US) and the US military (LeardMann et al., 2013; R. Lipari, Cook, Rock, & Matos, 2006; R. N. Lipari, Lancaster, & Jones, 2005; Street, Stafford, Mahan, & Hendricks, 2008; Surís et al., 2007; Turchik & Wilson, 2010; Walsh et al., 2014). Sexual violence refers to rape (i.e. completed or attempted penetration by force, threat, or by the facilitation of drugs/alcohol) or sexual assault (i.e. unwanted sexual contact by force, threat, or manipulation) (Basile, Smith, Briedling, Black, & Mahendra, 2014). In the US, an estimated 19.3% of women and 1.7% of men report lifetime rape, while 43.9% of women and 23.4% of men report other forms of sexual assault (Breiding et al., 2014). Rates of sexual assault in the military are equal or higher than rates reported in the general population. Best estimates suggest that 9.5%-33.0% of women reported an attempted or completed rape while serving in the military (Bostock & Daley, 2007; Coyle et al., 1996; Murdoch et al., 2007; Sadler et al., 2000; K. M. Skinner et al., 2000; Surís et al., 2007). Whereas, 0.7%-12.0% of men reported a sexual assault while serving in the military (Kimerling et al., 2007; Kimerling et al., 2010; Krinsley et al., 2003; Martin et al., 1998; Murdoch et al., 2004; Murdoch et al., 2007; D. W. Smith et al., 1999).

Studies have shown, in both military and civilian populations, that sexual violence is associated with an increased risk of mental health consequences (T. M. Davis & Wood, 1999; Gradus, Street, Kelly, & Stafford, 2008; Haskell et al., 2010; Kimerling et al., 2007; Kimerling et al., 2010; Murdoch et al., 2007; B. N. Smith et al., 2011; Street et al., 2008; Vogt et al., 2005; Walsh et al., 2014), particularly post-traumatic stress disorder (PTSD), depression, and anxiety (Campbell, Greeson, Bybee, & Raja, 2008; Decker, Rosenheck, Tsai, Hoff, & Harpaz-Rotem, 2013; Hankin et al., 1999; Kimerling et al., 2007; Kimerling et al., 2010; Lang, Rodgers, et al., 2003; Maguen et al., 2012; K. M. Skinner et al., 2000; Turchik & Wilson, 2010). An analysis of Veterans Health Administration data on veterans with military sexual trauma (MST), females were 8.8 times more likely to be diagnosed with PTSD and 2.3 times as likely to be diagnosed with PTSD and twice as likely to be diagnosed with depressive disorders compared to veterans without MST.

#### Information on the Lesbian, Gay, Bisexual, and Transgender (LGBT) Community

The LGBT acronym is an umbrella term, but each of the various populations that compose the LGBT community is distinct. The LGBT community share common experiences such as stigma, but also there are some key differences such as age, gender, race, ethnicity, and socioeconomic status. Lesbian women, gay men, and bisexual men and women are defined by their sexual orientation. Transgender individuals are defined by their gender identity and presentation (Institute of Medicine, 2011), therefore it will not be assessed in the current study since the focus is on sexual orientation. Gender Identity and Gender Expression

Gender identity is a person's self-identification of being male, female, or another gender. Ones gender identity can be in line with their sex at birth or it may be incongruent. Gender expression is defined by ones personality, appearance, and behavior and its cultural definition of being masculine or feminine. Gender role conformity is defined as an individual's gender expression and adherence to the cultural norms for people of his or her sex (Institute of Medicine, 2011).

Gender dysphoria is an individual's discomfort with one's own sex assigned at birth (Fisk, 1974). The dysphoria may result in an individual's unease with their primary or secondary characteristics, a sense of inappropriateness in one's gender role, and a strong identification with and the desire to live in the role of the other sex (Institute of Medicine, 2011). This has been classified as gender identity disorder in the DSM-IV (American Psychiatric Association, 2000).

Transgender individuals are composed of a diverse group of individuals. The group includes transsexuals (person who desires or have had hormone therapy and/or surgery to become more masculine or feminine and may live a majority of their time in the cross-gender roll); cross-dressers or transvestites (person who wears clothes and presents themselves as the opposite gender and may live part-time in the cross-gender roll); transgenderists (person who lives full-time in the cross-gender roll, may take hormones, but does not desire surgery); bigender persons (person who identifies themselves as being both male and female, may take hormones, and may live part-time in the cross-gender role); drag queens and kings (individual who dresses in closes associated with the opposite gender and adopts a hyper-masculine or hyper-feminine presentation,

and appears part-time in the cross-gender role); gender queer or two spirit individuals (term used by some Native-Americans for individuals with both masculine and feminine qualities, may or may not desire hormones or surgery, and may or may not live part or full time in the cross-gender role) (Institute of Medicine, 2011).

# Sexual Orientation

Sexual orientation refers to an individual's pattern or disposition to experience sexual or romantic desires, and relationships with people of one's same sex, opposite sex, or both sexes. Whether a sexual act or relationships is homosexual or heterosexual depends on the biological sex of the individuals involved. Sexual orientation encompasses attraction, behavior, and identity (Institute of Medicine, 2011).

Sexual attraction and behavior is understood as a continuum which ranges from exclusively heterosexual to exclusively homosexual (Kinsey, 1953; Kinsey, Pomeroy, & Martin, 1948). When sexual orientation is described in terms of identity, three main categories are discussed: heterosexuality (individuals whose attraction and behaviors are for the opposite gender), homosexuality (individuals whose attraction and behaviors are for people of the same sex), and bisexuality (Institute of Medicine, 2011). Some individuals may have a specific attraction to transgendered individuals (Coan, Schrager, & Packer, 2005; Operario, Burton, Underhill, & Sevelius, 2008; Weinberg & Williams, 2010).

#### Military Policy on Homosexuality and Sodomy

Homosexual military personnel have served and will continue to serve in the US military. There is evidence which supports the existence of homosexuals in each branch of the military, but their sexual orientation was a secret (Shilts, 1993). Homosexuals have been excluded from the military for various reasons. In the 1940s, the military used psychiatry's definition of homosexuality as a mental illness to exclude and justify the discharge of gay soldiers (Herek & Belkin, 2005). In the 1950s, homosexuals were seen as a threat to national security as they were more vulnerable to blackmail, therefore were prohibited from working in the federal government (Haggerty, 2003). It was not until 1973 that the American Psychiatric Association removed the diagnosis of homosexuality from the DSM II. In 1993, when President Clinton proposed lifting the military's ban on homosexuality, Congress and military leaders emphasized its threat to unit cohesion (Halley, 1999).

Prior to 1993, homosexuality in the military was regulated through a combination of sodomy provisions of military law or personnel military restrictions. The legal definition of sodomy was defined as "anal or oral sex between men or between a man and a woman" (Rostker et al., 1993). After World War II, the definition of sodomy was redefined to include sexual relations between women as well (Rostker et al., 1993).

#### Homosexuality and the Military, 1916 - 1940

Early attempts to regulate homosexual behaviors within the military were not formalized and sporadic. The first legal attempt to address homosexual behaviors in the military was enacted on March 1, 1917, Article 93 of the Articles of War, prohibited

sodomy (Colby, 1923). Article 93 prohibited assault with the intent to commit sodomy and it was cited as the primary reason to discharge homosexual men and women during World War I and II from service (J. S. Davis, 1991; US Department of Defense, 2010). Sodomy was included as a separate offense during the 1920 revision of the Articles of War and was not changed until 1951 (Colby, 1923).

During the period of the two World Wars, the military attempted to screen out homosexuals from service which utilized biological theories of the time. Characteristics which constituted exclusion included men who were overly feminine, sloped shoulders, broad hips, as well as the absence of facial and body hair. In addition, sexual relations between men was an exclusionary criteria (Shilts, 1993; War Department, 1921). World War II and Homosexuality, 1941 – 1946

During World War II, the Army continued to remove individuals who were considered sodomists through administrative proceedings. Between 1941 and 1945, the Army had twenty-four revisions regulating homosexuality. These revisions were a result of inconsistent treatment of individual cases within the military as well as the military increased willingness to consult and accept psychiatrists' suggestions with regard to homosexuals. Psychiatry's determination of homosexuality as a mental illness shifted the military's focus from the sexual act to the individual (Allan, 1990; Bérubé, 2010). If a man was determined to be a homosexual during the screening process, they were sent back to their recruiting stations with documentation detailing their rejection. To ensure that some men were not falsely identifying as being homosexual to avoid military service, the military conducted social investigations into their backgrounds. When women were allowed to enter the military, they were also subjected to a screening process. However, there were no policies concerning lesbians, and the law did not address lesbian sexual acts. Therefore, most homosexual women were able to enter the military undetected (Allan, 1990; Bérubé, 2010).

By the end of World War II, military policy on homosexuality had undergone several changes. The term "sodomists" was replaced with "homosexual". Individuals who were engaged in same-sex behaviors could be separated either through their resignation or administrative discharge. A growing amount of policy during this time supported that a homosexual individual could be easily identified and such person should be barred from military service (Rostker et al., 1993).

Cold War Era and Homosexuality, 1946 – 1956

In 1946, policies regarding homosexuals were relaxed in which permitted an honorable discharge for those who had homosexual tendencies, but did not commit sexual offenses while in service (War Department, 1945). However, this was short lived, in 1948, the option of an honorable discharge for homosexuals was removed and homosexuals were to be tried by court-martial or discharged as unfit (War Department, 1948).

The Department of Defense in 1949 issued a memorandum addressing homosexual behavior in all branches of the military which read: "Homosexual personnel, irrespective of sex, should not be permitted to serve in any branch of the Armed Services in any capacity, and prompt separation of known homosexuals from the Armed Forces be mandatory" (C. Williams & Weinberg). The 1950 Army Regulation which implemented this policy divided homosexuals into three classes. Class I homosexual offenses involved assault or coercion through force, fraud, intimidation, or seduction of a minor and resulted in a mandatory court-martial. A class II homosexual offense applied to individuals who engaged or attempted to engage in homosexual acts. A court-martial was the preferred manner of separation; however a resignation or a statement accepting a dishonorable discharge was also permitted. A class III homosexual was an individual who exhibited, professed, or admitted to homosexual tendencies, but did not commit any homosexual offenses, which permitted either an honorable or a general discharge (War Department, 1950).

In 1955, Class III homosexuals were permitted an honorable discharge if at induction they admitted to homosexual tendencies and were inducted anyway or had a record of heroic service. By 1958, a mandatory honorable discharge was the norm for Class III homosexuals (War Department, 1955).

#### Military and Homosexuality, 1960 - 1970

DoD policy on homosexuality remained unchanged until 1959. Revisions were made to DoD Directive 1332.14 regarding Administrative Discharges. Section VII.I of the directive indicated that sexual perversion, which included homosexual acts and sodomy, was considered a dischargeable reason for being unfit.

In 1965, the DoD revised regulations on the separation of homosexual personnel. It allowed for personnel facing a less-than-honorable discharge to present their cases before the administrative board and be represented by counsel. Prior to this change in directive, most who were accused of homosexuality cooperated without protest to safeguard others or prevent further punishment (C. J. Williams & Weinberg, 1971). There still remained inconsistent standards being applied to homosexuals, which led to further reviews and revisions on homosexuality in the military during the Carter Administration.

On January 16, 1981 a new edition of Directive 1332.14 was released with revisions to the enclosure on homosexuality. The revised directive clarified that after an investigation with findings that a person "engaged in, has attempted to engage in, or has solicited another to engage in a homosexual act," that there be a mandatory discharge. It is also the first time in which homosexuality has been noted to be incompatible with the military with the following:

The presence of such members [homosexuals] adversely affects the ability of the armed forces to maintain discipline, good order, and morale; to foster mutual trust and confidence among service members; to insure the integrity of the system of rank and command; to facilitate assignment and world wide deployment of service members who frequently must live and work under close conditions affording minimal privacy; to recruit and retain members of the armed forces; to maintain the public acceptability of military service; and to prevent breaches of security.

The revision further clarified that homosexuality alone was not sufficient for a misconduct discharge. If there were no other mitigating actions, the discharge could be an honorable discharge. This policy remained in effect until 1993.

#### Military and Homosexuality, 1993 – Present

On January 29, 1993, President Bill Clinton directed Secretary of Defense Les Aspin to develop a directive that would end discrimination due to sexual orientation and serving in the military. Secretary Les Aspin formed the Military Working Group to assess policy options on April 5, 1993. The Military Working Group was composed of a general from each service branch as well as a support staff composed of officers, enlisted personnel, and civilian employees (United States Department of Defense, 1993).

The RAND Corporation was also contracted in parallel with the Military Working Group to conduct a separate study on sexual orientation and the military. The report concluded that homosexuality was "not germane" to military service and recommended that clear standards be set for military personnel to maintain effective operations (Rostker et al., 1993).

During the review of the research conducted by the RAND Corporation and the Military Working Group, the Clinton administration announced its new policy that would tolerate homosexuals in the military and called it the "Don't Ask, Don't Tell, Don't Pursue" policy. The "Don't Ask" would halt the direct questioning of new recruits about their sexual orientation, the "Don't Tell" would require LGB personnel to keep their sexual orientation private, and the "Don't Pursue" would prevent investigations from being started.

In 1994, as part of the National Defense Authorization Act, Congress enacted much of the policy proposed by the Clinton administration, but excluded the "Don't Pursue" component of the policy. The new law was codified at Section 654 of Title 10 of the United States Code. The law is formally titled "Policy concerning homosexuality in the armed forces" and a member of the armed forces will be separated from the armed forces if he or she commits one of the following: homosexual acts or attempts, statements

of homosexuality, or marriage to a person of the same biological sex (United States Code, 1993).

In April 2010, President Obama asked the Secretary of Health and Human Services Kathleen Sebelius to improve the health and well-being of LGB individuals, families, and community. On November 30, 2010, the Department of Defense releases a report that concluded the repeal of the ban on the LGB in the military would have minimal negative impact on the military's effectiveness. On December 15, 2010, the House of Representatives voted to repeal "Don't Ask, Don't Tell" by passing bill H.R. 2965. On December 18, 2010 the Senate voted to repeal "Don't Ask, Don't Tell" by passing bill S. 4023. On December 22, 2010, President Obama official signs the repeal into law. Starting on September 20, 2011, the US military allowed LGB service members to serve openly (Belkin et al., 2012).

#### Military and LGB Research

Studies on sexual minorities within the US military is limited and focuses on the active army(Creel et al., 2013) and the perception, compatibility, and LGB impact on unit cohesion, readiness, and effectiveness (A. X. Estrada et al., 2013).

Data from public opinion polls indicate that a majority of Americans are in favor of allowing LGB individuals to serve in the US Military (National Defense Research Institute, 1993, 2010; Torres-Reyna & Shapiro, 2002; A. S. Yang, 1997). Data from military polls reveal that in the 1990s a large %age of military respondents expressed disapproval or opposition towards removing the ban on LGB in the military. Studies showed 60 to 72 % of military personnel disagreed with the permitting LGB individuals to serve openly (Armando X Estrada & Weiss, 1999; L. L. Miller, 1994). However, military polls from the 2000s reveal a decline in disapproval of LGB individuals serving in the military. In the 2000s, polls showed 40-60 % disapprove as compared to the 60 to 72 % in the 1990s, which shows individuals today are more tolerant of LGB individuals (Annenberg Public Policy Center, 2004; McGarry, 2010; Rodgers, Belkin, & Center, 2006).

Research on military attitudes towards LGB individuals have shown that negative attitudes to be associated with male gender, White or Latino background, conservative political views, lack of interpersonal contact with LGB service personnel, more time in the service, higher rank, as well as individuals serving in the combat arms (Armando X Estrada & Weiss, 1999; L. L. Miller, 1994; Moradi & Miller, 2009; Rodgers et al., 2006).

Studies on unit cohesion have shown that structural and situational factors play a more important role in unit cohesion than ones sexual orientation. 67 to 78 % of military personnel indicate that the removal on the bay of LGB in the military would have a positive, mixed, or no effect on task and social cohesion. Furthermore, 60 % of military respondents indicated that their length of term in the military would not change if the repeal on LGB individuals serving in the military was repealed (US Department of Defense, 2010).

Prior studies on trajectories of mental health have concentrated on civilian populations and less research has been conducted on trajectories of mental health in military populations, (Lowe, Galea, Uddin, & Koenen, 2014; Nandi et al., 2009; R. Pietrzak et al., 2014) as there is currently only one study that exists on trajectories of depression in a National Guard (NG) population (Sampson et al., 2015). Additionally,

only a handful of studies have examined the mental health of sexual minorities (SM) longitudinally and have been primarily on mental health and substance use trajectories in adolescents (Marshal et al., 2013; Marshal, Friedman, Stall, & Thompson, 2009; Needham, 2012; Pollard, Tucker, Green, P Kennedy, & Go, 2011; Russell, Driscoll, & Truong, 2002). The lack of military research on SM's is understandable due to previous military policies which prevented sexual minorities to serve openly. The repeal of the Don't Ask, Don't Tell (DADT) policy (10 USC § 654) by President Obama in 2011 provides a unique opportunity to study military sexual minorities by allowing soldiers to be open about their sexuality without fear of discharge from the military.

## Risk Factors in the General Lesbian, Gay, and Bisexual Community

Population studies over the past few decades have established that LGB individuals are at an elevated risk for mental health conditions which include anxiety, substance, and depressive disorders (Bostwick, Boyd, Hughes, & McCabe, 2010; S. D. Cochran & Mays, 2000a, 2000b; S. D. Cochran, Sullivan, & Mays, 2003; Conron, Mimiaga, & Landers, 2008; Fergusson, Horwood, & Beautrais, 1999; Gilman et al., 2001; M. King et al., 2008; Sandfort, de Graaf, Bijl, & Schnabel, 2001). The increased risk has been explained by the minority stress hypothesis, which suggests that living as a member of a stigmatized group leads to increased exposure to stressful life events which impacts mental health and wellbeing (Brooks, 1981; Meyer, 1995, 2003).

Studies have documented the increased risk of physical and sexual abuse among sexual minorities as compared to their heterosexual counterparts (Austin & Irwin, 2010; Balsam, Rothblum, & Beauchaine, 2005; S. D. Cochran, 2001). A recent prospective

study conducted by Hatzenbuehler and colleagues (2010) examined individuals who lived in states with a ban on same-sex marriage compared with states that did not have constitutional amendments found that the mental health of those who lived in states with an instituted ban were significantly worse than those in states without a ban (Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010). King and colleagues (2008) conducted a meta-analysis on LGB studies published between 1966 and 2005 and found that LGB individuals are 1.5 times more likely for depression as their heterosexual counterparts. Furthermore, the study found that the lifetime risk of suicide for LGB individuals was more than twice that of heterosexual individuals (M. King et al., 2008). Although more research is being conducted on the mental health of the LGB population, gaps still remain as there are conflicting findings from various studies.

#### Lesbian, Gay and Bisexual Psychopathology

#### Depressive Disorder

Population studies suggest higher rates of depression and depressive disorders among LGB individuals. Results from the National Household of Drug Abuse found that men who have sex with men were more likely than exclusively heterosexual men to be diagnosed with major depression. However, homosexually active women were no more likely than their heterosexual counterparts in being diagnosed with major depression (S. D. Cochran & Mays, 2000b). Study results from the NCS show women with any samesex partner had significantly higher 12-month prevalence of major depression (Gilman et al., 2001). A study of Latino and Asian Americans showed that both homosexual and bisexual women and men were more likely to have depressive disorders than their heterosexual counterparts (S. D. Cochran, Mays, Alegria, Ortega, & Takeuchi, 2007).

## Sexual Violence

Data from national samples indicate that sexual minority individuals are at heightened risk sexual violence in childhood (M. S. Friedman et al., 2011; T. Hughes, McCabe, Wilsnack, West, & Boyd, 2010); however, there is a dearth of information on risk for sexual violence throughout the life course among sexual minority individuals, including those in the military. Furthermore, national data indicate that sexual minority individuals have increased risk for mental health difficulties relative to heterosexual individuals (S. D. Cochran, 2001; S. D. Cochran et al., 2003), which may be explained by the minority stress model in which minorities experience increased stress resulting from stigma (Hatzenbuehler, 2009; Institute of Medicine, 2011; Meyer, 1995).

## **Minority Stress Model**

The minority stress model is an extension of social stress theory, which states that conditions in the social environment, as well as personal events, are sources of stress that may lead to mental and physical health conditions (Allison, 1998; Barnett & Baruch, 1987; Clark, Anderson, Clark, & Williams, 1999; Meyer, 2003 {Meyer, 1995 #208; Mirowsky & Ross, 2003; Pearlin, 1999)}. Minority stress is distinguished by the fact that excess stress experienced by stigmatized groups are a result of their minority position, such as prejudice and stigma (Meyer, 2003). The underlying assumption of minority stress is: 1. unique - minority stress is additive to general stressors experienced by all people, therefore, stigmatized individuals require additional effort to adapt than non-stigmatized individuals, 2. chronic – minority stress is related to underlying social and cultural structures; and 3. socially based – it stems from social processes, institutions, and structures beyond the individual rather than individual events or conditions that may characterize a person or a group (Meyer, 2003).

Meyers explains the minority stress model through distal and proximal distinctions. Distal stressors are defined as objective events or conditions and proximal processes are based on an individual's subjective perception and appraisal of such events (Meyer, 2003). Meyers believes there are three processes of minority stress that are relevant to LGB individuals: objective stressful events and conditions, expectations of such events and the vigilance that these expectations require, and the internalization of negative societal attitudes (Meyer, 1995; Meyer, Dean, & Herek, 1998). Another stressor that is important to consider is the concealment of one's sexual orientation and is seen as a proximal stressor because its stress is thought to come about through internal psychological struggles (Cole, Kemeny, Taylor, & Visscher, 1996; Cole, Kemeny, Taylor, Visscher, & Fahey, 1996; DiPlacido, 1998; Jourard, 1971; Meyer, 2003; Pennebaker, 1995).

#### **Stress-Ameliorating Factors**

It has been suggested that minority individuals respond to prejudice with coping and resilience (Allport, 1954). Researchers have agreed that positive coping is both a common process and beneficial one for minority groups (Clark et al., 1999). Thus,

minority stress is not only associated with stress but also with group solidarity and cohesiveness that protect individuals of a minority from adverse mental health effects (Branscombe, Schmitt, & Harvey, 1999; Clark et al., 1999; Crocker & Major, 1989; Kessler, Price, & Wortman, 1985; C. T. Miller & Major, 2000; Postmes & Branscombe, 2002; Shade, 1990).

The importance of coping with stigma has been seen in LGB populations. It has been suggested that through the coming out process that LGB individuals learn to cope and overcome the adverse effects of stress (Morris, Waldo, & Rothblum, 2001). Therefore, this indicates that both stress and resilience interact in predicting mental health. Sexual minorities counteract minority stress by establishing structures and values that enhance their group (Crocker & Major, 1989; D'Emilio, 2012; Meyer, 2003).

#### Stress and Identity

An individual's minority identity may also be related to minority stress and impact health outcomes. Characteristics of identity may be related to mental health both directly and in conjunction with stressors. (Meyer, 2003)A direct effect would suggest that identity characteristics can cause distress. While an interactive effect with stress may suggest that characteristics of identity would modify the effect of stress on health outcomes (Meyer, 2003). However, minority identity may result in a stronger affiliation with one's minority community, which could buffer the impact of stress (Branscombe et al., 1999; Brown, Sellers, Brown, & Jackson, 1999; Crocker & Major, 1989; Meyer, 2003). Another consideration is the prominence of one's identity may exacerbate stress. For example, in models which describe the coming out process as well as ones that describe racial identity, there is a tendency to see minority identity as prominent and ignore other personal and social identities (Cross Jr, 1995; Eliason, 1996; Meyer, 2003; Monteflores & Schultz, 1978). It has been noted that the stress process for lesbians is complex as it involves both sexual and gender identities (Brooks, 1981). However, sexual minorities of racial or ethnic minorities also need to manage diverse identities. For example, research on Black and Latino sexual minorities has shown that they confront homophobia in their respective communities and alienation from their racial or ethnic identity in the LGB community (Diaz, Ayala, Bein, Henne, & Marin, 2001; Espin, 1993; Loiacano, 1989; Meyer, 2003). Therefore, this has resulted in viewing sexual identity as fluid, instead of one that is stable (Brewer, 1991; Crocker & Quinn, 2000; Deaux & Ethier, 1998)d(Meyer, 2003).

Valence, which refers to the evaluative features of identity and is tied to selfvalidation, is another construct that may be relevant to stress. It has been shown that negative valence is a good predictor of mental health, with an inverse relationship with depression. A central feature of coming out models is identity valence which describes progress as improvement in one's self-acceptance and diminishment of internalize homophobia (L. A. Allen, Woolfolk, Gara, & Apter, 1996; Meyer, 2003; Woolfolk, Novalany, Gara, Allen, & Polino, 1995).

## Significance of the Proposed Research

With National Guard Soldiers playing a more vital role in OIF and OEF, it is essential to study sexual minorities in the military and improving the health of military sexual minorities. National Guard Soldiers are unique as they maintain civilian and military responsibilities. After a National Guard Soldier accomplishes their designated assignment, they return to their civilian duties.

In addition, with the repeal of Don't Ask, Don't Tell and the Defense of Marriage Act, LGB individuals are increasingly more visible, open, and acknowledged in our society. Healthy People 2020, a 10-year agenda for improving the Nation's health, identified improving the health of LGB individuals as an objective (US Department of Health and Human Services). Furthermore, the Institute of Medicine (IOM) released its report indicating "the existing body of evidence is sparse and that substantial research is needed" (Institute of Medicine, 2011). Therefore, clinicians and researchers are faced with a lack of health information on the LGB community.

The LGB community is considered to be a minority population and one of the first research questions that are typically addressed is the size and characteristics of the population. Demographic research on a minority population helps in identifying disparities which makes this group more visible in public policy (G. J. Gates & Ost, 2004). However, researchers have encountered challenges in collecting reliable data to assess the LGB population. Typically, data from the US census or a large probability sample is required to examine the characteristics of a population. There have been few surveys that have included questions on sexual orientation and even fewer in military surveys (Institute of Medicine, 2011).

The first attempts to describe sexual behavior in the US was conducted by Alfred Kinsey and his associates who studied the sexual feelings and experiences of US adults (Kinsey, 1953; Kinsey et al., 1948). The participants were not categorized by sexual orientation, but instead reported the extent of their sexual histories and whether it include heterosexual and homosexual desires and behaviors. In his 1948 report, Kinsey and colleagues reported 37% of males between adolescence and old age had some overt homosexual experience to the point of orgasm and 13% had reacted erotically towards other males without overt homosexual contact after adolescence (Kinsey et al., 1948). Generalizability of Kinsey's study to the US population is problematic due the sampling technique used as it was not a probability sample. However, the research demonstrated the feasibility to study sexuality in the general population (Institute of Medicine, 2011).

From the Kinsey study, researchers extrapolated the findings to estimate the proportion of the US population in each of the sexual orientation categories, even though the Kinsey study did not categorize sexual orientation. In 1990, Voeller extrapolated data from the Kinsey study and estimated that 90% of the US population was heterosexual and 10% was gay or lesbian (Voeller, 1990). At the time, further data on sexual orientation was lacking and could not corroborate the accuracy of the results from Voeller.

More recent studies allow for the generalizability of sexuality in the United States. The most authoritative national survey to date is the 1992 National Health and Social Life Survey (NHSLS) which assessed people by sexual orientation, behavior, and attraction. The study asked participants to identify their sexual orientation as heterosexual, homosexual, bisexual, or something else. The study reported approximately 2.8% of men and 1.4% of women labeled themselves as homosexual, gay,

lesbian, or bisexual. In terms of sexual desire, participants were asked to whom they were sexually attracted. It was reported that 7.7% of men and 7.5% of women reported same-sex attraction. In terms of sexual behavior, participants were asked during three time points (past 30 days, past 12 months, and since adolescence) with whom they have had sexual relations. It was reported that since adolescence 7.1% of men and 3.8% of women reported having same-sex partners. (Laumann, 1994; P. V. Miller, 1995).

More recently, the 2006 National Survey of Family Growth (NSFG), conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics, provides estimates on sexual orientation, behavior, and attraction. The study population for the NSFG is of a younger cohort, ages 18-44 as compared to the NHSLS study. The NSFG study asked participants "Do you think of yourself as heterosexual, homosexual, bisexual, or something else?" to determine sexual orientation and found that men between the ages of 18-44, 2.3% identified as homosexuals, 1.8% as bisexual, and 3.9% as something else. Among women in the same age group, 1.3% identified as homosexual, 2.8% as bisexual, and 3.8% as something else. In terms of sexual behavior, participants were asked if they engaged in same-sex oral or anal behavior. It was reported that 6.2% of men and 11.5% of women reported same sex behavior. For sexual attraction, 7.1% of men and 13.4% of women reported some degree of same-sex attraction (Mosher, Chandra, & Jones, 2005).

In 2008, the General Social Survey (GSS) based on a national probability sample provides additional estimates on the LGB community. For individuals ages 18-44, 4.1% of women and men identified as homosexual. Furthermore, 10% of males and females reported same-sex sexual behavior. The GSS study did not assess same-sex attraction (G.

J. Gates, 2010). Another survey which utilized a national probability sample was the 2009 National Survey of Sexual Health and Behaviors. The national probability sample was generated through the use of random digit dialing and only assessed sexual identity. It was reported that 6.8% of men and 4.5% of women self-identified as lesbian, gay, or bisexual (Herbenick et al., 2010).

An increasing number of population-based surveys are measuring sexual orientation (G. J. Gates, 2011), however, less research has been conducted on sexual orientation and the military. Military studies on sexual orientation have focused on veterans seeking health care from the Veterans Administration (VA) (Blosnich & Silenzio, 2013; B. N. Cochran, et al., 2013; G. J. Gates, 2011). This project is unique as it addresses an under researched minority population, the LGB in the National Guard, a non-treatment seeking population. The results of this study will be first National Guard study and military survey to examine three dimensions of sexual orientation and mental health. It is also the second military survey to examine sexual orientation and mental health, but the first military study to examine sexual orientation and mental health, but the first military study to examine sexual orientation and mental health, but the first military study to examine sexual orientation and mental health, but the first military study to examine sexual orientation and mental health, but the first military study to examine sexual orientation and mental health, but the first military study to examine sexual orientation and mental health did not assess sexual behavior (Barlas, Higgins, Pflieger, & Diecker, 2013; Creel et al., 2013). Insights from this study will add to the sparse information on the LGB community and address the objectives set forth by the IOM as well as Healthy People 2020.

In addition to studying sexual minorities, there is a growing recognition of the advantages of utilizing a longitudinal cohort sample to simultaneously investigate psychological, social and biological factors in military cohorts. This was recently underscored in the President's National Research Action Plan for Improving Access to Mental Health Services for Veterans, Service Members, and Military Families

(Department of Defense, Department of Veterans Affairs, Department of Health and Human Services, & Education, 2013). Also, highlighted in the 2011 report from The Institute of Medicine (IOM) is the need for substantial research on LGB health as it is sparse (Institute of Medicine, 2011). Furthermore, Healthy People 2020 has continued to identify improving the health of the LGB community as an objective (Health, Services, Prevention, & Promotion, 2012).

This is the first longitudinal military study on reserve forces to examine the three dimensions of sexual orientation: identity, sexual attraction, and sexual behavior. Studies often use two or fewer dimension of sexual orientation; however, reliance on two or fewer dimension may miss important differences among LGB individuals. There is a paucity of studies that have focused on the relative impact of civilian versus military experiences as well as the role of sexual orientation on soldier mental health. Among the studies that have included both civilian and military factors, limitations include crosssectional approaches and lack of a comprehensive set of predictors.

Furthermore, research on homosexual men and women service members within the US military is limited and focused on acceptance, values of the US military, and perceived impact of the integration of homosexual personnel (Estrada, Dirosa, & Decostanza, 2013). The study is also unique in focusing on the longitudinal characterization of these factors in members of the Reserve Component, recognizing that their composition and the circumstances they face are markedly different than members of the active duty component. Furthermore, the study is unique as it is the first National Guard study to examine an underserved population within the military, members who identify as part of a sexual minority.

# **CHAPTER 2: SPECIFIC AIMS AND HYPOTHESES**

## **Chapter Overview**

The following research has three specific study aims in addition to specific questions related to each aim which are further detailed below. Due to the dearth of research on sexual minorities and more specifically military sexual minorities, this is the first military study to date that has evaluated all three dimensions of sexual orientation. The specific aims and associated questions are derived from the current existing literature on sexual minorities and the minority stress theory. In cases where the literature is firm, the questions are written in a hypothesis format, whereas in cases the literature is sparse or non-existent, it is written in the form of an exploratory question.

# Project 1

The dearth of research on the LGB community within the US military is to be expected due to policies that were in place. Only recently in 2011, was the repeal of the Don't Ask Don't Tell (DADT) Policy by President Obama (10 USC § 654). The repeal of DADT allows researchers to explore risks among sexual minorities within the military and offers insights in ways to optimize their well-being and functioning.

Research on sexual minorities centers on the accurate assessment of an individual's sexual orientation. The few national studies which assessed sexual orientation status generally asked one or two of the three dimensions of sexual orientation. More recently, population studies have expanded to ask three dimensions of sexual orientation: identity, sexual attraction, and sexual behavior.

**Aim 1:** To determine the prevalence of sexual minorities in the OHARNG MHI and examine its association with PTSD and depression across three dimensions of sexual orientation (identity, behavior, and attraction) and sexual minority status.

**Hypothesis 1:** Non-heterosexual OHARNG soldiers will have a higher prevalence of PTSD and depression than their heterosexual counterparts.

Question 1: How many Ohio Army National Guard soldiers self-identify as LGB?

**Question 2:** How many Ohio Army National Guard soldiers report having a same-sex behavior in their lifetime?

**Question 3:** How many Ohio Army National Guard soldiers report any level of samesex attraction?

**Question 4:** How many Ohio Army National Guard soldiers are considered a sexual minority?

**Question 5:** Will the prevalence of sexual minorities differ by dimension of sexual orientation?

Question 6: Will the prevalence of PTSD differ by dimension of sexual orientation?

Question 7: Will the prevalence of depression differ by dimension of sexual orientation?

# **Project 2**

The issue of unwanted sexual experiences is an inherent problem in our society. Studies have shown that sexual trauma and assault are associated with serious mental health consequences (T. M. Davis & Wood, 1999; Gradus et al., 2008; Haskell et al., 2010; Kimerling et al., 2007; Kimerling et al., 2010; Murdoch et al., 2007; B. N. Smith et al., 2011; Street et al., 2008; Vogt et al., 2005; Walsh et al., 2014). Sexual violence refers to rape (i.e. completed or attempted penetration by force, threat, or by the facilitation of drugs/alcohol) or sexual assault (i.e. unwanted sexual contact by force, threat, or manipulation) (Basile et al., 2014). In the US, an estimated 19.3% of women and 1.7% of men report lifetime rape, while 43.9% of women and 23.4% of men report other forms of sexual assault (Breiding et al., 2014).

Rates of sexual assault in the military are equal or higher than rates reported in the general population. Best estimates suggest that 9.5%-33.0% of women reported an attempted or completed rape while serving in the military (Bostock & Daley, 2007; Coyle et al., 1996; Murdoch et al., 2007; Sadler et al., 2000; K. M. Skinner et al., 2000; Surís et al., 2007). Whereas, 0.7%-12.0% of men reported a sexual assault while serving in the military (Kimerling et al., 2007; Kimerling et al., 2010; Krinsley et al., 2003; Martin et al., 1998; Murdoch et al., 2004; Murdoch et al., 2007; D. W. Smith et al., 1999).

The Ohio Army National Guard Mental Health Initiative (OHARNG MHI), a longitudinal prospective cohort of Army National Guard soldiers, provides a unique opportunity to examine sexual minorities and how mental health disorders may differ.

**Aim 2:** To examine the multi-morbidity of PTSD and depression on lifetime sexual violence among sexual minorities in the Ohio Army National Guard as compared to their heterosexual counterparts.

**Hypothesis 1:** Sexual Minorities are more likely to report lifetime sexual violence than their heterosexual counterparts

**Question 1:** How many LGB Ohio Army National Guard soldiers will report having lifetime sexual violence?

**Question 2:** How many Ohio Army National Guard soldiers that report having a samesex behavior in their lifetime will report having lifetime sexual violence?

**Question 3:** How many Ohio Army National Guard soldiers that report any level of same-sex attraction will report having lifetime sexual violence?

**Question 4:** How many Ohio Army National Guard soldiers who are considered a sexual minority will report having lifetime sexual violence?

**Question 5:** Will the prevalence of lifetime sexual violence differ by dimension of sexual orientation?

**Hypothesis 2:** Sexual minorities in the OHARNG who have experienced sexual violence are more likely to have PTSD and depression as compared to their heterosexual counterparts.

**Question 1:** Among those who have experienced sexual violence, will the prevalence of PTSD differ by dimension of sexual orientation?

**Question 2:** Among those who have experienced sexual violence, will the prevalence of depression differ by dimension of sexual orientation?

## **Project 3**

More studies have been carried out on posttraumatic stress disorder (PTSD) in US military personnel who have served in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) (Bryan & Heron, 2015; Wells et al., 2011). In contrast, depression has received less attention than PTSD in OIF and OEF military personnel (Bryan & Heron, 2015; Gadermann et al., 2012). Prevalence of depression among OIF and OEF veterans range from 2-24% (Elbogen et al., 2014; Gadermann et al., 2012; C. W. Hoge et al., 2004; Karen H Seal et al., 2009; Tanielian & Jaycox, 2008; Thomas et al., 2010; Wells et al., 2010).

Population studies on sexual minorities suggest higher rates of depression and depressive disorders among Lesbian, Gay, and Bisexual (LGB) individuals. Results from the National Household of Drug Abuse found that men who have sex with men were more likely than exclusively heterosexual men to be diagnosed with depression. A study conducted by Cochran et al found that gay and bisexual men were 3.0 times as likely to be diagnosed with depression as heterosexual men (S. D. Cochran et al., 2003). Furthermore, study results from the National Comorbidity Survey (NCS) show women with any same-sex partner had significantly higher 12-month prevalence of depression (Gilman et al., 2001).

Prior studies on trajectories of mental health have concentrated on civilian populations and less research has been conducted on trajectories of mental health in military populations, (Lowe et al., 2014; Nandi et al., 2009; R. Pietrzak et al., 2014) as there is currently only one study that exists on trajectories of depression in a National Guard (NG) population (Sampson et al., 2015). Additionally, only a handful of studies

have examined the mental health of sexual minorities (SM) longitudinally and have been primarily on mental health and substance use trajectories in adolescents (Marshal et al., 2013; Marshal et al., 2009; Needham, 2012; Pollard et al., 2011; Russell et al., 2002).

The lack of military research on SM's is understandable due to previous military policies which prevented sexual minorities to serve openly. The repeal of the Don't Ask, Don't Tell (DADT) policy (10 USC § 654) by President Obama in 2011 provides a unique opportunity to study military sexual minorities by allowing soldiers to be open about their sexuality without fear of discharge from the military. Given the paucity of SM military research coupled with a dearth of mental health trajectory analyses in a National Guard population, this study, to the best of our knowledge, is the first to examine trajectories of depressive symptoms overtime and sexual minority status as a predictor of trajectory group membership in a NG sample.

**Aim 3:** To identify trajectories of depressive symptoms in the OHARNG and determine if sexual minority status is associated with trajectory group membership.

**Hypothesis 3:** Sexual minority status will be a significant predictor of trajectory group membership for individuals displaying higher levels of depressive symptoms as compared to individuals with no depressive symptoms.

**Question 1:** How many different depression trajectories will exist for Ohio Army National Guard soldiers across five waves of data collection?

**Question 2:** Will a greater percentage of Ohio Army National Guard soldiers be resistant to depression symptoms across five waves of data collection?

**Question 3:** Will the following risk factors be predictive of group membership: Young age (17-25), Never been married, lower education attainment (High school diploma or less), been deployed to Iraq or Afghanistan, 6 or more lifetime traumatic events, and sexual minority status.

# **CHAPTER 3: STUDY METHODS**

## **Chapter Overview**

This chapter provides details regarding the design, recent findings, and implementation of the Ohio Army National Guard Mental Health Initiative (OHARNG MHI). In addition, it details the specific measures and the methods utilized in the dissertation to carry out each respective project.

## Description of the OHARNG MHI

An important focus of the US Department of Defense's mental health research has been the management of post-traumatic stress disorder (PTSD), which was initially added to the Diagnostic Statistical Manual (DSM) fourth edition (American Psychiatric Association, 2000) as a result of long-term experiences with veterans from the Vietnam War. Military personnel returning from OIF and OEF receive education on depression and PTSD prior to deployment and are screened during redeployment using the Post-Deployment Health Assessment process. However, there are concerns that returning service members may return with other psychological problems.

To facilitate and augment the DoD's commitment to improve the mental health of its service members. The OHARNG MHI has been tasked to develop research protocols, led by University Hospitals Case Medical Center, Case Western Reserve University, and partnering with regional and national institutions to further the study of the profile, incidence, onset and the nature of mental health disorders.

The OHARNG MHI started in 2008 as an observational study utilizing a crosssectional study sample to form a prospective longitudinal cohort to study the relationship between pre-existing mental illness, deployment to Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF), and post-deployment related mental health and overall psychosocial adjustment. OHARNG soldiers enlisted as of June 2008-Febrary 2009 were eligible for inclusion into the study. Exclusionary criteria were limited to a soldier being retired upon initial contact and the soldier must be at least 17 years old, the minimum age of an emancipated minor in the state of Ohio. The study did not include individuals who were illiterate and were non-English speaking.

This project has conducted annual assessments on 3,578 members of the Ohio National Guard between 2008 and 2015. In the event that a participant was deployed, the annual interview was performed when they returned. The telephone survey required 60 minutes on average (depending on the individual history of the service member) to administer and constituted the primary dataset.

The OHARNG MHI consisted of a telephone survey and/or a clinical subsample survey. Of those who consented and completed the telephone survey Wave 1 (2008-2009, N = 2616), which was conducted by Abt SRBI survey research firm, a random sample of 25% of individuals were invited to participate in the in-depth clinical subsample and 100% of those invited agreed to receive information on the study.

If the soldier agreed to obtain information about the in-depth clinical cohort, their information was sent to the coordinating center and given a unique separate identification number. Either UHCMC or UT then contacted the soldiers depending on the participant's proximity to each location. Soldiers could opt out of this clinical cohort at any point during recruitment. There were 500 participants who completed the clinical subsample portion of the study.
During Wave 2 (2009-2010) of the study survey a total of 1,770 telephone surveys were completed. Given that this study is a longitudinal cohort study, it was expected that participants would be lost to follow-up due to mobilizations and even possibly death given the population that we are studying deals with war and combat. As a result of this attrition there would be decreasing sample sizes each year of study administration thus decreasing statistical power. Therefore, in 2010, the external scientific advisory board recommended that the OHARNG MHI re-open study recruitment and pursue a dynamic cohort methodology to replenish the sample each year in both the telephone and clinical sub-sample surveys. After a participant completes dynamic cohort baseline survey, follow-up survey years for the participant will consist of completing the current year's survey.

The first replenishment group started in Wave 3 (2010-2011) of survey administration. There were 1,691 telephone interviews completed of which 578 were newly enrolled participants who completed the telephone interview. The replenishment continued for all future subsequent waves of data collection. Wave 4 which was conducted during 2011-2012, a total of 1,691 interviews were completed of which 263 were new participants. There was no study data collection from 2012-2013 due to the lack of funding for the project. New funding came through to administer the telephone during 2014-2015 (Wave 5) in which 1,594 interviews were completed with 121 newly enrolled participants. The project is currently on its sixth wave of data collection. However, data is only collected on the telephone survey as the clinical subsample portion of the study has ended as of December 2013.

#### Preliminary Findings from the OHARNG MHI

The OHARNG MHI has identified that PTSD comorbidity is associated with suicidal ideation. Individuals with depression or alcohol dependence accompanied by PTSD are at a higher risk for suicidality. Individuals with PTSD along with co-occurring depression and alcohol dependence have increased suicidality by 7-folds (Calabrese et al., 2011).

Potentially modifiable pre-, peri-, and post-deployment characteristics associated with deployment-related PTSD among Ohio Army National Guard Soldiers have been identified which may act in concert to shape the health of soldiers exposed to trauma. Preparedness, unit support, and post-deployment support are associated with a lower risk of deployment-related PTSD. These are examples of modifiable characteristics of deployment experience and provide areas for future research efforts in developing interventions which may point to approaches that may mitigate the mental health consequences of war (Goldmann et al., 2012).

Coincident depression and PTSD are predictive of developing alcohol abuse during and after deployment. These findings suggest deployment-related exposures may increase the risk of alcohol-related problems and have important implications for the development of future interventions and policies. It also suggests the need for

comprehensive screening and support services for National Guard soldiers with comorbid psychiatric and substance abuse conditions (Marshall et al., 2012).

The Ohio Army National Guard soldiers are not a severely depressed cohort, but are represented by having previously mild depressive symptoms. Major depressive disorder symptomology is best represented by somatic and non-somatic factors. These findings contribute to the understanding of the true components of major depressive disorder and potentially aid clinicians in prioritizing treatment outcomes at reducing more severe major depressive disorder symptoms (Elhai et al., 2012).

The OHARNG MHI has examined the relations between the underlying dimensions of PTSD and major depression. Results indicate that PTSD's dysphoria factor is related to depression by way of depression's somatic construct. These results contribute to the understanding of PTSD's high comorbidity with depression (Biehn et al., 2013).

PTSD, depression, and HIV risk behavior among Ohio Army National Guard Soldiers – The prevalence of HIV risk behavior (6.4%) within the Ohio Army National Guard Soldiers is higher than that found in a nationally representative sample of US adults conducted in 2005. Soldiers reporting both PTSD and Major Depressive Disorder after experiencing a traumatic event were more likely to report past-year HIV risk behavior. These findings suggest that mental health problems including PTSD and depression may play a role in augmenting vulnerability to HIV (Marshall et al., 2013).

Ohio Army National Guard Soldiers who smoke have a greater risk of suicidal ideation and concurrent depression mediates this relationship. The findings suggest the

importance of screening for smoking status when evaluating suicide risk in this high risk population (Goodwin et al., 2013b).

Persistent smoking is associated with new onset of depression among Ohio Army National Guard Soldiers. The findings suggest the burden of mental and physical health consequences of smoking. It emphasizes the importance of making smoking cessation programs available to soldiers to prevent subsequent mental health problems as well as a means to stop smoking (Goodwin et al., 2013a).

The OHARNG MHI has validated the telephone-administered PHQ-9 against the in-person administered SCID-I major depressive module. The results provide guidelines for the use of the telephone administered PHQ-9 in assessing the lifetime prevalence of a major depressive episode and diagnosis in a non-clinical population, with implications for clinical use (Fine et al., 2013).

Furthermore, the OHARNG MHI has validated the lay-administered mental health assessments in a large Ohio Army National Guard cohort – Baseline study data suggests that alcohol abuse and dependence may be higher in the Ohio Army National Guard than the general population. Results also suggest that computer assisted telephone psychopathology assessments are valid and reliable research tools for studying the National Guard (Prescott et al., 2014).

## **Study Population**

The data were derived from the OHARNG MHI, which started in 2008. The purpose of this original study was to study the relationship between pre-existing mental

illness, deployment to Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF), and post-deployment related mental health and overall psychosocial adjustment. OHARNG soldiers enlisted as of June 2008-Febrary 2009 were eligible for inclusion into the study. Exclusionary criteria were limited to a soldier being retired upon initial contact and the soldier must be at least 17 years old, the minimum age of an emancipated minor in the state of Ohio. The study did not include individuals who were illiterate and were non-English speaking. This project has conducted annual assessments on 3,457 members of the Ohio National Guard between 2009 and 2014. The project is currently on its sixth wave of data collection.

The sample population for the study described herein was comprised of subjects who had completed the baseline survey, as well as being administered the three sexual orientation questions embedded in Wave 5 (n = 1,594). Sexual orientation data for the current study were linked with the participants' baseline assessments which were administered between 2008 and 2015. Mental health diagnoses and demographic characteristics were based on participants' baseline assessment, with the exception of the longitudinal analyses which utilized all five study waves of data.

As seen in diagram below, the 1,594 participants in the sample population come from various waves of the OHARNG MHI. 70.3% (n=1,121) came from Wave 1, 13.9% (n=221) came from the first replenishment group during Wave 3, 8.2% (n=131) came from the second replenishment group which started in Wave 4, and finally 7.6% (n=121) came from the third replenishment group which was during Wave 5 (2014-2015).



## **Study Subjects**

The National Guard Bureau, Office of Human Research Protections of the US Army Medical Research and Materiel Command, along with the institutional review boards of University Hospitals Case Medical Center, University of Toledo, University of Michigan, Columbia University, Boston University, and the Ann Arbor Veterans Administration Medical center approved the study protocol.

## Assessments

Measures of Military Experience

<u>USMC Numerical Index of Military Occupational Specialties:</u> The Military Occupational Specialties (MOS) categories were used to classify current and past roles in the military (US Marine Corps).

<u>The 2000 Surveys of Reserve Component Personnel (2000 RCS)</u>: The 2000 Surveys of Reserve Component Personnel is also known as the Reserve Component Surveys (RCS). There are two 2000 RCS instruments: Form M (for members) and Form S (for Spouses). Only Form M was utilized for the study and it is used to gather experience, attitudes, and demographics on the soldiers (Rizzo, Morganstein, Nieva, & Perry, 1995; Simmons, D'Arnato-Neff, Ferro, & Lappin, 2002).

## Measures of Psychopathology

The prevalence of individual psychopathologies will be scored based on the respective assessments scoring rules to determine a diagnosis based on the Diagnostic and Statistical Manual for DSM-IV disorders (DSM-IV).

## Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) was assessed with PTSD Checklist (PCL). The PCL is a 17-item checklist of PTSD symptoms that are chosen based on the DSM-IV criteria for diagnosing PTSD. The PCL can be used for screening, diagnosing, and monitoring symptom changes during and after deployment for PTSD (Forbes, Creamer, & Biddle, 2001; Ruggiero, Del Ben, Scotti, & Rabalais, 2003).

PTSD was assessed through the administration of the PTSD Checklist-Civilian Version (PCL) (Blanchard, Jones-Alexander, Buckley, & Forneris, 1996) at each wave of study collection. PTSD symptoms were asked in relation to two self-identified worse traumas: worst self-identified civilian trauma and the worst self-identified deployment trauma from their most recent deployment. Participants were asked of their symptoms for their worse civilian and deployment related traumatic event in their lifetime and then again in the past-year. During subsequent follow-up surveys, participants were asked if their worse trauma from the previous survey year was the worst or if there was a new worst trauma either civilian or deployment related. In order to be diagnosed with PTSD all of the following DSM-IV criteria must be met: person experiencing A1 and A2 criteria (experiencing a traumatic event as well as intense fear, hopelessness, and horror due to trauma), criterion B of having at least 1 symptom of re-experiencing the trauma, criterion C of having at least 3 symptoms of avoidance of the trauma, criterion D of at least 2 symptoms of hyperarousal, criterion E of at least a duration of 1 month, and criterion F of having significant impairment(F. Weathers, Huska, & Keane, 1991). A tally of symptoms was calculated for each criterion of PTSD and then a dichotomous variable (yes/no) was created to determine if each criterion was met based on each criterions pre-requisite of having a specified number of symptoms. If all criterions A-F were met, then an individual was diagnosed with PTSD.

For the purposes of our study analyses, individuals who were diagnosed with either civilian related PTSD, deployment related PTSD, or both were counted only once. Therefore, a dichotomized variable was created to indicate whether an individual was diagnosed with PTSD or not diagnosed with PTSD in their lifetime or in the past-year.

#### Depression

Depression, including major depressive disorder (MDD), was assessed with the use of the Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 scores each of the 9 DSM-IV criteria for depression (Kroenke, Spitzer, & Williams, 2001; Löwe, Kroenke, Herzog, & Gräfe, 2004).

In order to qualify for having a depression, participants had to have at least 5 of the 9 symptoms "more than half the days", with at least 1 of the symptoms of having a depressed mood or anhedonia for a period of at least 2 weeks (Kroenke & Spitzer, 2002;

Kroenke et al., 2001). In waves 2-5, participants are asked about their symptoms since their previous assessment.

For each participant, a total tally of the number of depressive symptoms were calculated based on having endorsed "more than half the days". After the tally was calculated, individuals who had 5 or more total symptoms were further examined to determine if one of the 5 symptoms were having depressed mood or anhedonia. A dichotomous variable was then created indicating participants who met the 5 or more symptoms for depression and one of the 5 symptoms being depressed mood or anhedonia. The dichotomous variable for depression was then further determined to be lifetime or past-year based on the assessment of time of when the depression occurred for the participant.

#### MEASURES OF SEXUAL ORIENTATION

#### Self-Identification

The self-identification question was originally developed by the National Center for Health Statistics (NCHS) (Sell, 1996). The question only focuses on identity and prevents the confounding of other dimensions such as attraction and behavior. The terms "sexual orientation" or "identity" are not included in the stem of the question as this is confusing to many respondents, just as race or ethnicity when it is used in the stem of a question. The answer options of gay, lesbian, and bisexual are kept separate, which allows for the potential of combining or disaggregating by orientation (Sexual Minority Assessment Research Team, 2009). The question that was used in the study survey was: Do you consider yourself to be: 1. Heterosexual or straight, 2. Gay or lesbian, 3. Bisexual, 4. Other (Specify), 8. Don't Know, 9. Refused. Participants who indicated Don't Know or Refused were not included in the analysis based on self-identification of your sexual orientation.

Individuals who indicated other as a response required manual inspection of their responses and if they could not be categorized based on being heterosexual, gay or lesbian, or bisexual, they were not considered part of the analyses. For analyses, a dichotomous category was created which was Lesbian, Gay, or Bisexual (LGB) or non-LGB. Individuals were in the LGB category if they endorsed 1, 2, or 3 in the self-identification question.

## Sexual Behavior

The sexual behavior question was initially developed by the Sexual Minority Assessment Research Team (SMART) (Sexual Minority Assessment Research Team, 2009). Sexual behavior is the act of the individual having sexual intercourse with individuals of the same sex, opposite sex, or both sexes. It is important to note that not all individuals who have same-sex attraction engage in sexual activity with the same sex or engage in sexual activities solely of the same-sex (Laumann, 1994; Saewyc et al., 2004; Saewyc et al., 2009).

The sexual behavior question used in the study survey was: In the past (time period: lifetime) who have you had sex with? 1. Men only, 2. women only, 3. both men and women, 4. I have not had sex, 8. Don't know, 9. Refused. Individuals who endorsed Don't Know or Refused were not part of the analyses based on sexual behavior. For

analyses, three separate categories were created: same-sex behavior, no-same sex behavior, and never had sex.

In order to create the categories, the participant's gender and their respective responses were evaluated in order to have the participant categorized into one of the three groups. For male participants - If they endorsed having sex with men only then they were categorized as same-sex behavior. If they endorsed having sex with both men and women they were categorized as same-sex behavior. If they endorsed having sex with only women, then they were categorized as having no-same-sex behavior. If they endorsed never had sex, the male participant was categorized as never had sex. For female participants – If they endorsed having sex with women only then they were categorized as having same-sex behavior. If they endorsed having sex with both men and women then they were considered having sex with women only then they were categorized as having same-sex behavior. If they endorsed having sex with both men and women then they were considered having same-sex behavior. If they endorsed having sex with men only, they were categorized as having no same-sex behavior. If they endorsed never having sex then they were categorized as never had sexual behavior.

#### Sexual Attraction

Sexual attraction was initially developed by the National Study of Family Growth (NSFG) (Mosher et al., 2005). A spectrum of responses is important for this question as people are attracted in varying degrees to people of both genders (Sexual Minority Assessment Research Team, 2009).

The sexual attraction question used in the study was: People are different in their sexual attraction to other people. Which best describes your feelings? Are you: 1. only attracted to female, 2. mostly attracted to females, 3. equally attracted to females and

males, 4. mostly attracted to males, 5. only attracted to males, 6. not sure, 8. Don't know, and 9. Refused.

Participants who endorsed Not sure, Don't Know or Refused were not considered part of the sexual-attraction analyses. Next, the participants gender was evaluated against their sexual-attraction question to ensure they are categorized into the proper category of either having same-sex attraction or no same-sex attraction. Male participants who endorsed mostly attracted to females, equally attracted to females and males, mostly attracted to males, or only attracted to males were categorized as having same-sex attraction. Male participants who endorsed being only attracted to females were categorized as no same-sex attraction. Female participants who endorsed mostly attracted to males, equally attracted to females and males, mostly attracted to males, equally attracted to females and males, mostly attracted to males, equally attracted to females and males, mostly attracted to males, equally attracted to females and males, mostly attracted to females, and only attracted to females were categorized as having same-sex attraction. Female participants who reported only being attracted to males were categorized as not having same-sex attraction.

#### Sexual Minority Status

The sexual minority status category was a created category based on the responses from each of the three dimensions of sexual orientation: identity, behavior, and attraction. A dichotomous variable (yes/no) was created. Individuals were considered to be part of a sexual minority if they self-identify as LGB, reporting ever having same-sex behaviors, or having any level of same-sex attraction.

## Sexual Violence

Sexual violence was assessed using the Life Events Checklist (LEC) which was developed at the National Center for PTSD concurrently with the Clinician Administered PTSD Scale (CAPS) to assess exposure to potentially traumatic events (Gray, Litz, Hsu, & Lombardo, 2004). A wide array of traumatic experiences are assessed which include questions about rape and other unwanted sexual contact.

The OHARNG MHI administered a modified version of the Life Events Checklist from the Clinician Administered PTSD Scale (CAPS) to collect lifetime trauma exposure on each participant (Blake et al., 1995; F. W. Weathers, Ruscio, & Keane, 1999). As part of the checklist, participants were asked, "In your lifetime, have you been 1. Raped? 2. Experienced another kind of sexual assault or unwanted sexual contact as a result of force, threat of harm, or manipulation?" A dichotomous variable indicating the presence or absence of reporting lifetime sexual violence was created. Participants who affirmatively endorsed having experienced either of the two traumas were considered to have experienced lifetime sexual violence.

#### Analyses

#### Univariate Analyses

Exploratory data analysis (EDA) will be conducted using SAS 9.4 (Cary, NC). EDA will include the calculation of means, medians, percentages, proportions, standard deviations, and skewness/kurtosis as appropriate. If outliers or nonstandard distributions exist, variable transformations or standardized cut-points in the data will guide recoding of continuous variables. The influence of outliers will be assessed and medians used if required. Differences between two means will be tested using the t-tests or rank tests and the categorical data will be analyzed using Chi-square tests and/or with 95% confidence intervals to guide interpretation. Descriptive statistics such as frequency counts, percentages, means, medians, and standard deviations, will be created to fully characterize the sample. Confidence intervals as well as point estimates will be used to estimate population values on all variables. Descriptive statistics for sub-samples of interest, such as racial and ethnic groups, gender groups, and sexual orientation groups, will also be presented as will comparisons between persons who undertake the survey using different methods to assess for any potential differences. Contingency tables with appropriate statistical tests (e.g., chi-square, exact, or trend) will be constructed to test for differences in key variables between sub-samples.

#### **Regression Models**

For aims 1 and 2, regression models will be the key methods used to estimate the effects of key independent variables on the dependent variables of interest. All analyses and point estimates of the effects of interest will be presented together with 95% confidence interval estimates. No systematic adjustment for multiple comparisons will be employed, but results will be reported in tandem with a description of the range of models and variables considered throughout the analyses. All regression models will be adjusted for a time-effect due to participants in our sample entering our study survey and being administered their baseline surveys at different time frames of the survey administration.

## Logistic Regression

Analytically, we will primarily use regression models will be used to estimate effects of variables in different domains and psychopathology. Logistic regression will be used for dichotomous outcomes and linear regression models will be used for continuous outcomes. The logistic regression models to be fitted are shown below:

logit 
$$pr(Y = 1 | relevant factor, X) = b_0 + b_1[relevant factor] + b_2 X$$
, where

Y=1 is the presence of a particular mental or physical health outcome b<sub>1</sub> is the coefficient of interest, describing the relationship between a relevant domain and the outcome b<sub>2</sub> is a vector of coefficients for important potential confounding variables, represented by vector X above. The outcome will be replaced for continuous variables (e.g., number of symptoms) by Y, count of continuous outcome.

 $E(Y | relevant factor, X) = b_0 + b_1 [relevant factor] + b_2 X$ 

The coefficient b<sub>1</sub> will be used to test the hypothesis that relevant factors are associated with the risk of psychopathology. Therefore, the hypotheses here will primarily involve at first determination of coefficients in regression analyses that will provide us with information about the relative importance of the various determinants to the risk of psychopathology.

### Latent Class Growth Models (LCGM)

Aim 3 will be addressed using LCGM to identify and document the trajectory patterns of depression among the cohort. LCGM is a semi-parametric approach used to

identify distinct typologies of individuals following a similar pattern of change over time on a given variable (Andruff, Carraro, Thompson, Gaudreau, & Louvet, 2009; D. Nagin, 2009; D. S. Nagin, 1999; D. S. Nagin & Tremblay, 2001, 2005). A set of intercepts and slopes are estimated for each trajectory group and unlike standard latent growth curve modeling techniques, LCGM fixes the slope and intercept to equality across individuals within a trajectory (D. Nagin, 2009; D. S. Nagin, 1999; D. S. Nagin & Tremblay, 2001, 2005).

LCGM allow for the modeling of three different distributions which is dependent upon the rating scale of the measurement used to measure the variable of interest (D. Nagin, 2009; D. S. Nagin, 1999; D. S. Nagin & Tremblay, 2001, 2005). A zero-inflated Poisson (ZIP) is used for depression symptom count as it is modeling the conditional distribution of count data given group membership with more zeroes than under the Poisson assumption (Lambert, 1992).

The probability of observing the data trajectory given group membership is represented by:

$$f(\mathbf{y}_l | \mathbf{z}_i, \mathbf{w}_l) = \sum_{k=1}^{K} \Pr(C_i = k | \mathbf{Z}_l = \mathbf{z}_l) \Pr(\mathbf{Y}_l = \mathbf{y}_l | C_i = k, \mathbf{W}_l = \mathbf{w}_l).$$

where yi is the probability of observing the data trajectory z are the risk factors k is the group Wi is the time-dependent covariate

The time-stable covariate effect on group membership is modeled by the generalized logit model below:

$$\Pr(C_{i} = k | \mathbf{Z}_{i} = \mathbf{z}_{i}) = \frac{\exp(\theta_{k} + \mathbf{\lambda}_{k}^{*} \mathbf{z}_{i})}{\sum_{l=1}^{K} \exp(\theta_{l} + \mathbf{\lambda}_{l}^{*} \mathbf{z}_{l})}$$

In selecting the best model, the Bayesian Information Criterion (BIC) is generally used when testing latent class growth models (Laub, Nagin, & Sampson, 1998) to determine the optimal number of groups (Jones & Nagin, 2007; Jones, Nagin, & Roeder, 2001). In simulations, the BIC performed the best among the information criteria-based indices (Collins, Fidler, Wugalter, & Long, 1993; Hagenaars & McCutcheon, 2002; Magidson & Vermunt, 2004; Nylund, Asparouhov, & Muthén, 2007), such as the Akaike's Information Criterion (AIC). Furthermore, simulations studies have shown the adjusted BIC (Sclove, 1987) is superior to other information criteria statistics (C.-C. Yang, 2006).

There are two manners in which the BIC can be used to evaluate the number of trajectory groups. First, the change in the BIC between two models measures the weight of evidence against the null model that is used. As models with more groups are tested, the BIC of the more complex model is compared against the null model by taking the difference in the BIC values to determine the change. The largest change in BIC between the two models (complex vs null) is used to determine the best fitting model (Jones et al., 2001). Second, the estimate of the log Bayes Factor is approximately equal to two times the difference in BIC values; comparing a more complex model to a simpler model (Jones et al., 2001). Therefore, changes in the log Bayes Factor greater than 10 indicates a better fit of the model (Norris et al., 2009).

Following the fitting of a model using Proc Traj, the shape of each trajectory group (i.e. intercept, linear, quadratic, cubic) is fit based on statistical significance (p < 0.05). Proc Traj permits models up to the fourth polynomial and model both linear and

non-linear trajectories (Arrandale, Koehoorn, MacNab, & Kennedy, 2006; Jones et al., 2001). Respondents are assigned to the trajectory for which the individual's behavior best conforms (Muthén & Shedden, 1999). Each estimate can be interpreted as the log of the odds ratio of the impact of the particular risk factor on the probability of membership in the specified group relative to the referent group (Jones & Nagin, 2007).

## **CHAPTER 4: SYNOPSIS OF THE THREE MANUSCRIPTS**

In this dissertation, the analyses and results for each of the three study aims are presented in the form of manuscripts, which have been formatted according to the respective journals in which they will be submitted and peer reviewed.

The first manuscript evaluates the three dimensions of sexual orientation and sexual minority status and presents demographic and mental health characteristics of nonheterosexual OHARNG soldiers compared to their heterosexual counterparts. Lifetime and past-year PTSD and depression were the mental health diagnoses of interest. Unadjusted and adjusted logistic regression was used to determine whether each dimension of sexual orientation and sexual minority status was associated with PTSD and depression.

The second manuscript focuses on lifetime sexual violence in the OHARNG. The manuscript details the prevalence of lifetime sexual violence between non-heterosexual and heterosexual OHARNG soldiers. Unadjusted and adjusted logistic regression was used to determine whether sexual orientation and the presence of lifetime sexual violence was associated with lifetime and past-year PTSD and depression

The third manuscript of this dissertation examines depression symptom count in the OHARNG across all five waves of study data. LCGA, through the use of Proc Traj in SAS 9.4, was used to determine the number of individual trajectories of depression in the OHARNG. Furthermore, risk profiles were developed to determine if sexual minorities were more likely to be in a particular trajectory group as compared to the resistant trajectory group.

## CHAPTER 5

Sexual Orientation and the Prevalence of PTSD and Depression

From the Ohio Army National Guard Mental Health Initiative

## INTRODUCTION

A growing body of evidence has emerged over recent decades suggesting that sexual minorities are at an increased risk for mental health disorders compared to their heterosexual counterparts (Bostwick et al., 2010; S. D. Cochran & Mays, 2000a, 2000b; S. D. Cochran et al., 2003; Conron et al., 2008; Fergusson et al., 1999; Gilman et al., 2001; M. King et al., 2008; Sandfort et al., 2001). The increased risk has been explained by the 'minority stress model', which posits that living as a member of a stigmatized group leads to increased exposure to stressful life events, which affects mental health and wellbeing (Brooks, 1981; Meyer, 1995, 2003). A meta-analysis conducted by King et al (Michael King et al., 2008) found that LGB individuals had at least 1.5 times higher risk for lifetime depression and anxiety disorders compared to heterosexual individuals.

Population-based information on sexual minorities is frequently limited due to the reliance on an overly simplified single dimension of sexual orientation. Several studies have highlighted the challenges associated with the use of a single dimension of sexual orientation in analyses (Bostwick et al., 2010; Igartua, Thombs, Burgos, & Montoro, 2009; McCabe, Hughes, Bostwick, West, & Boyd, 2009; Sell, 1997; Young & Meyer, 2005). Some research has considered different operational dimensions of sexual orientation and how these different dimensions are associated with mental health indicators (Bostwick et al., 2010; McCabe et al., 2009; Midanik, Drabble, Trocki, & Sell, 2007). However, few military studies assess sexual orientation, and no military study has compared mental health indicators across dimensions of sexual orientation that encompass attraction, behavior, and identity (Institute of Medicine, 2011).

Studies on sexual minorities within the US military are limited and it was only recently (September 20, 2011) that the Don't Ask Don't Tell (DADT) policy was

repealed(10 USC § 654), allowing openly LGB US military service members to serve without fear of being discharged. Data from the 2000 Census 2000 suggest that nearly one million American veterans are lesbian, gay, or bisexual (LGB) (G. Gates, 2004). More recently, the 2008 General Social Survey suggests that approximately 36,000 to 48,500 LGB soldiers are serving in active duty or reserves, which represents 2.2 to 2.5 percent of active duty personnel (J. A. Davis, 2009; G. J. Gates, 2010). When guard and reserve components are included, nearly 65,000 to 71,000 men and women in the military are likely to be LGB, which accounts for 2.8 percent to 3.4 percent of all military personnel (G. Gates, 2010). Little is known about sexual minorities in the military and the few studies that have been carried out are limited their focus to the Regular Active Army (Creel et al., 2013) and veterans (J. Blosnich et al., 2013; J. R. Blosnich et al., 2012; J. R. Blosnich, Mays, et al., 2014; J. R. Blosnich & Silenzio, 2013; Bolton & Sareen, 2011; Booth, Mengeling, Torner, & Sadler, 2011; B. N. Cochran et al., 2013).

Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) led to a substantial increase in the number of reservists being called to active duty where nearly 500,000 of the 1.2 million US reservists had been mobilized and deployed (Bonds et al., 2010). Compared to their active-duty counterparts, NG soldiers experience unique stressors. Reserve forces are often deployed separately from their unit, maintain a civilian job while being deployed, and a limited time of health insurance after deployment (Iversen et al., 2009; Milliken et al., 2007; Thomas et al., 2010). To address the paucity of research on mental health and military sexual minorities, this study is a first to document the prevalence of sexual minorities across several different dimensions of sexual orientation and their associated posttraumatic stress disorder (PTSD) and depression prevalences in a population based sample of the Ohio Army National Guard.

#### METHODS

#### **Participants**

The present study was one component of the Ohio Army National Guard Mental Health Initiative (OHARNG MHI), a longitudinal prospective study of mental health in OHARNG soldiers. Using a simple random sample, participants were drawn from all serving members of the OHARNG between June 2008 and February 2009 who had identifiable addresses listed with the Guard (N=12,225). After excluding participants who opted out not to be part of the study (1,013, 8.3%), had an invalid or missing telephone number listed with the Guard (1,130, 10.1%), had retired or too young (1,364, 2.8%), did not wish to participate (1,364, 20.9%), were non-English speaking (31, 0.4%), and not contacted before the close of the cohort (2,316, 26.5%), 2,616 enrolled into this study.

Additional waves of recruitment took place to increase sample size, including 578 subjects from Wave 3 (~2010-2011), 263 subjects from Wave 4 (~2011-2012), and 121 subjects from Wave 5 (~2014-2015). Structured telephone interviews lasting 60-minutes were completed using a computer assisted telephone interviews performed by trained interviewers. Assessment of mental health conditions were based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria (American Psychiatric Association, 2000). Questions regarding timing were added to determine the

time that symptoms emerged, including past year, and lifetime. Verbal informed consent was obtained from all respondents and all subjects were compensated for their time.

Three sexual orientation questions were added to Wave 5 of the study to specifically assess sexual identity, behavior and attraction. The analytic sample of the present study included subjects who had completed the baseline survey, as well as the three sexual orientation questions embedded in Wave 5 (n = 1,594). This sample included 44.6% of all baseline surveys. Sexual orientation data for the current study were linked with the participants' baseline assessments which were administered between 2008 and 2015. Mental health diagnoses and demographic characteristics were based on participants' baseline assessment.

The National Guard Bureau, Office of Human Research Protections of the US Army Medical Research and Materiel Command, along with the institutional review boards of University Hospitals Case Medical Center, University of Toledo, University of Michigan, Columbia University, Boston University, and the Ann Arbor Veterans Administration Medical center approved the study protocol.

#### MEASURES

#### Sexual Orientation

Three dimensions of sexual orientation were assessed in Wave 5 using questions recommended by the Williams Institute (Sexual Minority Assessment Research Team, 2009). Due to the restricted sample size, each dimension of sexual orientation was further aggregated. Sexual identity (SI) was assessed with the question: "Do you consider yourself to be: heterosexual or straight; gay or lesbian; or bisexual?" Sexual identity was collapsed into two categories, including gay, lesbian, and bisexual (LGB) versus non-LGB. Sexual behavior (SB) was ascertained with the following question: "In the past (lifetime) who have you had sex with?" The answer options for this question were: men only; women only; both men and women; and I have not had sex (Sexual Minority Assessment Research Team, 2009). Sexual behavior was aggregated into samesex behaviors, no same-sex behaviors, and no sexual behavior. Sexual attraction (SA) was assessed using the question: "People are different in their sexual attraction to other people. Which best describes your feelings? Answer options were based on a continuum: only attracted to women; mostly attracted to women, equally attracted to women and men; mostly attracted to men; only attracted to men; and not sure (Mosher et al., 2005). Sexual attraction was grouped into categories of same-sex attraction and no same-sex attraction, which was dependent on the participant's gender. Additionally, the three dimensions of sexual orientation were combined into a dichotomous variable called 'sexual minority'. Soldiers were assigned to the 'sexual minority' category if they selfidentified as gay, lesbian, bisexual, had any self-report of same sex behaviors, or any degree of self-reported same-sex attraction.

#### Posttraumatic Stress Disorder

PTSD was assessed through the administration of the PTSD Checklist-Civilian Version (PCL) (Blanchard et al., 1996). The PCL is a standardized self-report measure containing 17 items. PTSD symptoms were asked in relation to two self-identified worst traumas: worst self-identified civilian trauma and the worst self-identified deployment trauma from their most recent deployment. The diagnosis of PTSD was based on DSM- IV criteria and the validity and reliability of the PCL has been tested and described elsewhere (Calabrese et al., 2011; Conybeare, Behar, Solomon, Newman, & Borkovec, 2012; Keen, Kutter, Niles, & Krinsley, 2008; Lang, Laffaye, Satz, Dresselhaus, & Stein, 2003; Marshall et al., 2012; Ruggiero et al., 2003; Wilkins, Lang, & Norman, 2011).

## Depression

Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), a 9item self-report depression module which assesses the nine DSM-IV symptoms of a major depressive episode. If participants responded affirmatively to any depression items, they rated the severity of the depression symptoms from 1 = several days to 3 = nearly every day. To be diagnosed with depression, participants had to endorse at least 2 or more depression symptoms and at least 1 of the symptoms of having a depressed mood or anhedonia (Kroenke & Spitzer, 2002; Kroenke et al., 2001). Validation work on this study population suggests this broader definition of depression assessed on the PHQ-9 most closely corresponds to depression assessed in the clinical reappraisal sample. .

## Demographic Characteristics

Demographic characteristics for the current analyses included gender, age, race (White, Black, Other), educational attainment (less than high school, high school graduate/GED, some college or technical training, college graduate/graduate work/graduate degree), income ( $\leq$  \$20,000, \$20,001-\$40,000, \$40,001-\$60,000, \$60,001-\$80,000,  $\geq$  \$80,0001) relationship status (married, divorced/separated/widowed), military rank (enlisted, warrant officer, officer, other), most recent deployment location (never deployed, non-conflict area, conflict area), number of lifetime deployments (0, 1, 2 or more), and total number of traumatic events (0, 1-5, 6-11, 12 or more).

#### STATISTICAL ANALYSIS

We examined differences in past year and lifetime prevalence of PTSD and depression between LGB and non-LGB; Same-Sex Behavior, No Same-Sex Behavior, No Sexual Behavior; Same-Sex Attraction and No-Same Sex Attraction; and Sexual Minority and Non- Sexual Minority subsamples. Bivariate associations were examined with chi-square test of independence and the Fisher's exact test as appropriate. Outcomes were further tested with multiple logistic regression models. Regression models were adjusted for demographic variables that were found to be significantly different across groups as well as based on prior empirical research. All models were adjusted for gender, race, age, marital status, household income, education, rank, most recent deployment location, total number of lifetime traumatic events, and wave at study entry. Analyses were conducted using SAS version 9.4 (SAS Institute, Cary, North Carolina).

#### RESULTS

#### **Demographics**

Table 1 summarizes the demographic characteristics of the study sample. Our current study population continues resemble the original OHARNG MHI cohort and the overall OHARNG, as it is predominately white (87.3%) and male (86.8%). Our sample is slightly younger than the OHARNG, between the ages of 17-24 (40.5%). Nearly half of the participants reported being single (49.0%), more than half had incomes less than

\$60,000, and 47.9% reported some college or technical training. A large majority of participants reported being enlisted ranks and almost half (47.6%) never deployed. Overall, 8.0% of the OHARNG sample were considered part of a sexual minority population. Approximately 2.5% of the OHARNG sample identified as LGB. 3.4% reported having at least one same-sex partner in their lifetime, and 5.5% reported same-sex attraction.

Compared to their heterosexual counterparts, LGB OHARNG soldiers were more likely to be single (87.2% vs 48.0%, p<.0001), between the ages of 17-24 (64.1% vs 39.82, p=0.020), to be of Black (15.4% vs 7.0%, p=0.011) or Other race (12.8% vs 5.1%, p=0.011), never deployed (76.9% vs 46.8%, p<.01) and a greater proportion of being female (56.4% vs 12.2%, p<.0001). Similar differences were observed across sexual behavior, sexual attraction and sexual minority status (data not shown).

Across dimensions of sexual orientation and gender, women were more likely than men to report a sexual minority identity, same-sex behavior, and same-sex attraction. 9.5% of women identified themselves as being lesbian or bisexual, as compared to 1.2% of men identifying as gay or bisexual. 12.3% of women reported having a history of at least one same-sex sexual partner or having sexual intercourse with both men and women. 20.9% of women reported some level of same-sex attraction (Table 2).

## Sexual Identity

As shown in Table 3, LGB identities were associated with higher rates of past year (15.4% vs 5.0%, p=0.014) and lifetime PTSD (18.0% vs 6.6%, p=0.015) as

compared to heterosexual identities. After adjusting for socio-demographic and military characteristics (Table 4), the odds of past-year PTSD was 3.7 times (95% CI= 1.3, 10.7) for LGB self-identified soldiers as compared to those who identified as heterosexual.

## Sexual Behavior

Behaviorally, soldiers reporting a history of same-sex partners, were associated with past-year PTSD (13.0% vs 5.0% vs 2.4%, p=0.044) as compared to those who reported a history of heterosexual or no sexual behaviors. In addition, same-sex behaviors were associated with a higher prevalence of past year (24.1% vs 11.8% vs 2.4%, p=0.004) and lifetime depression (35.2% vs 19.1% vs 9.8%, p=0.004) (Table 3). Guard members who have a history of same-sex partners had greater odds of past year PTSD (AOR=2.8, 95% CI 1.08, 7.21) than soldiers without a history of same-sex partners. Furthermore, Guard members reporting ever participated in same-sex behaviors had nearly twice the odds of past-year depression (AOR = 2.1, 95% CI 1.04, 4.21) and lifetime depression (AOR = 2.2, 95% CI 1.15, 4.02) than soldiers with heterosexual only behaviors (Table 4).

## Sexual Attraction

Soldiers who were sexually attracted to the same-sex were more likely to report past-year and lifetime PTSD and depression as compared to soldiers attracted to the opposite sex (Table 3). Adjusted regression models indicate that Guard members who are attracted to the same-sex had higher odds of past-year depression (AOR = 2.3, 95% CI=1.3, 4.1) and lifetime depression (AOR = 2.9, 95% CI 1.7, 4.8) than soldiers not having same-sex attraction (Table 4).

## Sexual Minority

Collectively, sexual minority soldiers were significantly more likely to report lifetime depression (29.9% vs 18.4%, p=0.002) as compared to non-sexual minority soldiers (Table 3). Sexual minority guard members were twice as likely to report lifetime depression (AOR = 2.1, 95% CI=1.3, 3.3) than soldiers not identified as a sexual minority (Table 4).

Overall, of the five mental health conditions collected in the study (PTSD, Depression, Generalized Anxiety Disorder, Alcohol Abuse, and Alcohol Dependence) 22.8% and 33.9% met criteria for at least one past-year and lifetime psychiatric syndrome respectively (data not shown).

## DISCUSSION

To the best of our knowledge, this study is the first to document the prevalence of sexual minorities across three dimensions of sexual orientation and their associated PTSD and depression prevalences (Galea, 2015). Consistent with findings from previous convenience-based samples (Bell & Weinberg, 1978; Evans, 1971; McKirnan & Peterson, 1989; Nurius, 1983; Saghir, 1973; Saghir, Robins, Walbran, & Gentry, 1970a, 1970b; Siegelman, 1972; Thompson, McCandless, & Strickland, 1971) of sexual minorities and the National Household Survey of Drug Abuse a population-based survey (S. D. Cochran & Mays, 2000b), nearly 70% of individuals did not meet criteria for any of the five past-year mental health conditions collected. The fact that the OHARNG MHI is a population-based sample drawn from the OHARNG without reference to sexual orientation or level of mental health conditions, provides support for the conclusion that sexual minority status is not usually accompanied by mental health conditions. Our study is the first, as we are aware, to have shown similar findings in a sample of NG soldiers.

Despite this, our study did find a higher prevalence for PTSD and depression in the OHARNG population, when non-heterosexuals are compared to their heterosexual counterparts. Sexual orientation, whether defined by identity, behavior, or attraction, were generally more likely to report past-year PTSD than those who identify as heterosexual. We found that past-year PTSD across dimensions of non-heterosexual orientation ranged from 8.7% to 15.4% and that lifetime PTSD ranged from 10.2% to 18.0%. Of some interest, a study on minority veterans, which utilized only sexual identity, identified 18% of LGB veterans to be positive for PTSD. However, it was unclear if these data represented past-month, past-year, or lifetime) (B. N. Cochran et al., 2013). By comparison, the early 1990s population-based National Comorbidity Baseline Survey (NCS-1) reported that 9.6% for past-year PTSD, but the assessment of sexual orientation was based only on same-sex behavior (Gilman et al., 2001). One comparable study on a National Guard population conducted by Calabrese et al (2011) reported a prevalence of 7.2% for past-year and 9.5% for lifetime PTSD. Of note, the rates of PTSD across dimension of sexual orientation were higher than those found by Calabrese et al (2011) and may suggest that such differences should take sexual orientation into consideration.

A higher prevalence of past-year and lifetime depression was associated with same-sex behavior and same-sex attraction only. Across dimensions of sexual orientation, we found that past-year depression ranged from 17.3% to 24.1 and 29.9% to 39.1% for lifetime depression. This finding reflects similar findings from populationbased studies that suggest higher rates of depression and depressive disorders among LGB individuals (S. D. Cochran et al., 2003). However, our findings exceed those in a study of National Guard soldiers where past-year depression was 14.0% and 21.4% for lifetime (Calabrese et al., 2011) whereas current depression was 12% in a study of selfidentified LGB veterans (B. N. Cochran et al., 2013) and past-year depression was 20.8% in a study of the general population based on same-sex behaviors (Gilman et al., 2001).

Overall, a larger proportion of soldiers report same-sex behavior and attraction than self-identify as LGB. This pattern of prevalence in sexual orientation has also been seen in studies of the general population (Bostwick et al., 2010; Matthews, Blosnich, Farmer, & Adams, 2014; McCabe et al., 2009). This cautions against relying on a single question to assess sexual and against the aggregation of all three dimensions of sexual orientation into a single category, both of which approaches obscure important differences (Ward, Dahlhamer, Galinsky, & Joestl, 2014).

Our study found that 9.5% of women in the OHARNG were either lesbian or bisexual and 1.2% were gay or bisexual men. This finding is consistent with the study conducted by Gates and colleagues (2004, 2010) who utilized data from the American Community Survey and the 2008 General Social Survey that concluded that lesbian and bisexual women were more likely than gay or bisexual men to be serving in the military (J. A. Davis, 2009; G. Gates, 2004, 2010). However, it should be noted that our study

proportion of LGB men and women in the Guard differed from estimates by Gates, which may be attributed to Gates and colleagues' use of Bayes' rule to calculate and derive the probability that someone is LGB and in the Guard/Reserves. Our study also found that sexual minority OHARNG soldiers were significantly younger and more likely to be female, which has been previously reported in a study conducted by Cochran et al (2013) on a LGB veteran population (B. N. Cochran et al., 2013).

This study has several strengths. Among these strengths was the use of a representative sample from the OHARNG rather than a convenience sample. Diagnosis of PTSD and depression were based on DSM-IV criteria and assessed using standardized instruments that have been validated in our study population. Furthermore, sexual orientation was assessed across three dimensions, which allowed for better categorization of individuals as being part of a sexual minority group.

The interpretations of these findings must take into consideration some limitations. These include the aggregation of categories within each dimension of sexual orientation to increase statistical power, which may obscure differences among each SM subgroup (Matthews et al., 2014) as prior research has indicated differences between Gay/Lesbians and Bisexual individuals (T. L. Hughes, Johnson, & Wilsnack, 2001; Matthews et al., 2014; McCabe, Boyd, Hughes, & d'Arcy, 2003; McCabe, Hughes, & Boyd, 2004; W. F. Skinner & Otis, 1996; Wilsnack et al., 2007). Despite aggregating the groups, the number of sexual minority OHARNG soldiers in the current study was small and may limit generalizability to other National Guard populations as well as limit the statistical power of the study. Only Wave 5 of the OHARNG MHI included questions on sexual orientation and are unable to establish a temporal order. The use of telephone methodology instead of self-report of sexual orientation may have led to underreporting due to the stigma surrounding mental health (Greene-Shortridge, Britt, & Castro, 2007; C. W. Hoge et al., 2004; Kim, Thomas, Wilk, Castro, & Hoge, 2010; R. H. Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009) and sexual orientation in a military culture (Haggerty, 2003; Rostker et al., 1993).

Further limitations of the current study include the assessment of the three constructs of sexual orientation which were measured using different timeframes. Both the sexual identity and sexual attraction questions did not specify a timeframe whereas the sexual behavior questions were asked over the soldier's lifetime, in contrast to other studies that have used past-year or past-5-year measures (S. D. Cochran & Mays, 2000b; Gilman et al., 2001; Sandfort et al., 2001). The current study also assumed that sexual orientation status remained static instead of being a dynamic characteristic. Moreover, the sexual behavior question did not assess the number of sexual partners, nor if sex was consensual or forced. Due to the manner in which sexual orientation is operationalized, comparisons across studies may seemingly yield different results, such as utilizing different references of time frames in screening the participants, which emphasizes the importance of standardizing sexual orientation measures (Institute of Medicine, 2011).

The findings from this research provide evidence of the feasibility to collect information regarding sexual orientation on a military population. Although sexual minority status was associated with increased PTSD and depression, there is no indication that sexual minority itself causes the disparity. Rather, it may be a combination of social factors such as stigma and discrimination projected onto sexual

minorities which may affect their health (J. R. Blosnich, Farmer, Lee, Silenzio, & Bowen, 2014; M. S. Friedman et al., 2011; Hatzenbuehler et al., 2010).

Additionally, results demonstrate the importance of considering multiple dimensions of sexual orientation in defining sexual minorities in current and future research as the health risks and benefits of one dimension of sexual orientation may not extrapolate to another dimension of sexual orientation. Further research examining differences in military mental health among those who are openly out regarding their sexual identity as compared to those who are not, exploring the acceptance of sexual minorities in the military, and longitudinal data on sexual minorities is needed to better understand the mental health needs of this population. Sexual minorities appear to be a vulnerable subgroup who may benefit from additional support and education on PTSD and depression.

## ACKNOWLEDGMENTS

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Demographic Characteristics       I         Gender       I         Male       10         Female       2         Race       I         White       10         Black       11         Other       4         Age       11         17-24       6         25-34       4         35-44       3         45+       1         Married       6         Divorced/Separated/Widowed       11         Single       11         Single       11         Some collego anted/Widowed       3         \$40,001 - \$60,000       3         \$40,001 - \$60,000       3         \$40,001 - \$60,000       3         \$60,001 - \$80,000       2         ≥ \$80,001       3         Enlisted       12         High School Graduate/GED       3         Some college or technical training       7         College graduate/Graduate Work/Graduate Degree       4         Rank       11         Enlisted       11         Warrant Officer       2         Officer       2         Officer	Overall (N = 1594)	
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Officer     2       Other     2       Most Recent Deployment Location     2       Never deployed     7	226 1	14.2
Other     2       Most Recent Deployment Location     2       Never deployed     7	24	1.5
Most Recent Deployment Location       7         Never deployed       7	23	1.4
Never deployed 7		
	759 4	47.6
Nonconflict area 4	432 2	25.3
Conflict Area 4	403 2	27.1

# Table 1 - Demographic Characteristics of OHARNG MHI Participants
Total Number of all traumatic events		
	119	7.5
1-5	607	38.1
6-11	500	31.4
12+	368	23.1
Number of Lifetime Deployments		
0	759	47.6
1	398	25.0
2 or more	437	27.4
Sexual Identity		
LGB	39	2.45
Non-LGB	1552	97.37
Sexual Behavior		
Same-Sex Behavior	54	3.39
No Same-Sex Behavior	1495	93.79
No Sexual Behavior	41	2.57
Sexual Attraction		
Same-Sex Attraction	87	5.46
No Same-Sex Attraction	1503	94.29
Sexual Minority		
Yes	127	7.97
No	1464	91.84

\* 3 participants were excluded from the analyses as they did not respond to any of the sexual orientation questions

Not all values add up to 100% due to missing values

	Overall N = 1594	1	Males		Females	
Sexual Orientation Measures	n (%)	n	Percent	n	Percent	p- value
Sexual Identity						
Heterosexual/Straight	1552 (97.37)	1363	98.55	189	89.57	<.0001
Gay/Lesbian	18 (1.13)	6	0.43	12	5.69	
Bisexual	19 (1.19)	11	0.80	8	3.79	
Sexual Behavior						
Only Male Partners	184 (11.54)	9	0.65	175	82.94	<.0001
Only Female Partners	1329 (83.38)	1320	95.44	9	4.27	
Both Male and Female Partners	36 (2.26)	19	1.37	17	8.06	
Never had sex	41 (2.57)	32	2.31	9	4.27	
Sexual Attraction						
Only Females	1345 (84.38)	1337	96.67	8	3.79	<.0001
Mostly Females	40 (2.51)	32	2.31	8	3.79	
Equally Males and Females	8 (0.5)	5	0.36	3	1.42	
Mostly Males	26 (1.63)	1	0.07	25	11.85	
Only Males	171 (10.73)	5	0.36	166	78.67	
Not sure	1 (0.06)	0	0.00	1	0.47	

Table 2- Dimensions of Sexual Orientation by Gender

\* 3 participants were excluded from the analyses as they did not respond to any of the sexual orientation questions Not all values add up to 100% due to missing values

				Sex	ual Identity					Sexu	ial Behavio	L				Sexual	Attraction		_		Sexua	I Minority		
	Overall (	N=1594)		106-		1	S	ame-Sex B	havior	Heterose	N lenxa	o Sexual B	ehavior		Same-Se	×	No Same-s	ex		Vac 1 1	164	No lund	1.0	
			וו	cc-	וואס רמם (נו:	(7cc1-		(n=54	1) 1	Behavior (r	1=1495)	(n=41	(	1	Attraction (I	1=87) Att	raction (n=	1503)		nt=n) sar	17	bT=UÌ ONI	34)	
Condition	L	%	u	%	u	%	p-value	u	%	u	%	u	1 %	p-value	u	%	u	⊷d %	/alue	u	%	u	d %	-value
PTSD														-										
Past Year	83	5.2	9	15.4	77	5.0	0.014	7	13.0	75	5.0	1	2.4	0.044	10	11.5	73 4	1.9	.021	11	8.7	72	4.9	0.068
Lifetime	110	6.9	7	18.0	103	6.6	0.015	8	14.8	101	6.8	1	2.4	0.050	12	13.8	98	5.5 0.	600	13	10.2	97	6.6	0.122
Depression																	_	_						
Past Year	191	12.0	∞	20.5	183	11.8	0.098	13	24.1	177	11.8	1	2.4	0.004	21	24.1	170 1	1.3 <	.001	22	17.3	169	11.5	0.053
Lifetime	308	19.3	12	30.8	296	19.1	0.068	19	35.2	285	19.1	4	9.8	0.004	33	39.1	274 1	8.2 <4	1000	38	29.9	270	18.4	0.002

Table 3 - Past-Year and Lifetime Prevalence of PTSD and Depression acrossDimension of Sexual Orientation

		allinali-			PTSD P	ast Year			Depression	n Lifetime			Depression	ı Past Year	
	95	% CI			95%	S CI			95%	CI			626	¢ CI	
Dimension of Sexual AOR	Lower CI	Upper CI	p-value	AOR	Lower Cl	Upper Cl	p-value	AOR	Lower Cl	Upper Cl	p-value	AOR	Lower Cl	Upper Cl	p-value
Orientation			2000			5 5220	5 5 4			5 5220	22.2			5	P 100
Sexual Identity															
LGB vs Non LGB 2.60	0.98	6.92	0.056	3.70	1.28	10.68	0.016	1.90	0.89	4.08	0.099	1.82	0.77	4.30	0.172
Sexual Behavior															
Same Sex Behavior vs															
No Same Sex Behavior 1.91	0.79	4.59	0.151	2.79	1.08	7.21	0.035	2.15	1.15	4.02	0.017	2.09	1.04	4.21	0.039
No Sexual Behavior															
vs No Same Sex															
Behavior 0.54	0.07	4.32	0.564	0.75	0.09	6.12	0.789	0.54	0.18	1.66	0.284	0.18	0.02	1.40	0.101
Sexual Attraction															
Same Sex Attraction															
vs No Same Sex 1.59	0.76	3.31	0.217	2.19	0.98	4.91	0.058	2.88	1.73	4.78	<.0001	2.31	1.30	4.10	0.005
Sexual Minority															
Yes vs No 1.45	0.72	2.90	0.300	1.97	0.92	4.22	0.080	2.10	1.33	3.32	0.002	1.57	0.92	2.69	0.102

 Table 4 - Adjusted Odds Ratios for Past-Year and Lifetime PTSD and Depression

 across Dimensions of Sexual Orientation

# **CHAPTER 6**

The Prevalence of Sexual Violence Across Dimensions of Sexual Orientation in Ohio Army National Guard Soldiers

#### Abstract

*Purpose:* To assess the association of posttraumatic stress disorder (PTSD) and depression with lifetime sexual violence across dimensions of sexual orientation. *Methods:* Sexual orientation (identity, behavior, and attraction), sexual violence, and PTSD and depression data were collected via structured interviews on 1,594 soldiers from the Ohio Army National Guard Mental Health Initiative (OHARNG MHI). Multiple logistic regression models were used to examine differences in sexual violence and mental health disorders across dimension of sexual orientation.

*Results:* One in four sexual minority soldiers reported lifetime sexual violence compared to 8% of non-sexual minority soldiers. Relative to non-sexual minority soldiers without sexual violence, adjusted logistic models revealed that sexual minority soldiers with sexual violence were 4.3 and 4.4 times more likely to meet lifetime PTSD and depression criteria, respectively, while non-sexual minority soldiers with sexual violence were 3.4 and 1.7 times more likely to meet lifetime PTSD and depression criteria, respectively to meet lifetime PTSD and depression criteria, respectively, soldiers were more likely to have experienced lifetime sexual violence compared to non-sexual minority soldiers. Sexual violence and dimension of sexual orientation contributed to a higher burden of PTSD and depression. Results suggest that lifetime sexual violence inflicts serious health effects on all soldiers, however additional stress experienced by sexual minorities may exacerbate these negative outcomes. Therefore, when developing effective strategies and programs in addressing sexual violence within National Guard soldiers, it is recommended to consider additional life events experienced by sexual minorities.

## Introduction

The issue of unwanted sexual experiences is a pervasive problem in both United States (US) and the US military (LeardMann et al., 2013; R. Lipari et al., 2006; R. N. Lipari et al., 2005; Street et al., 2008; Surís et al., 2007; Turchik & Wilson, 2010; Walsh et al., 2014). Sexual violence refers to rape (i.e. completed or attempted penetration by force, threat, or by the facilitation of drugs/alcohol) or sexual assault (i.e. unwanted sexual contact by force, threat, or manipulation) (Basile et al., 2014). In the US, an estimated 19.3% of women and 1.7% of men report lifetime rape, while 43.9% of women and 23.4% of men report other forms of sexual assault (Breiding et al., 2014). Rates of sexual assault in the military are equal or higher than rates reported in the general population. Best estimates suggest that 9.5%-33.0% of women reported an attempted or completed rape while serving in the military (Bostock & Daley, 2007; Coyle et al., 1996; Murdoch et al., 2007; Sadler et al., 2000; K. M. Skinner et al., 2000; Surís et al., 2007). Whereas, 0.7%-12.0% of men reported a sexual assault while serving in the military (Kimerling et al., 2007; Kimerling et al., 2010; Krinsley et al., 2003; Martin et al., 1998; Murdoch et al., 2004; Murdoch et al., 2007; D. W. Smith et al., 1999).

Studies have shown, in both military and civilian populations, that sexual violence is associated with an increased risk of mental health consequences (T. M. Davis & Wood, 1999; Gradus et al., 2008; Haskell et al., 2010; Kimerling et al., 2007; Kimerling et al., 2010; Murdoch et al., 2007; B. N. Smith et al., 2011; Street et al., 2008; Vogt et al., 2005; Walsh et al., 2014), particularly post-traumatic stress disorder (PTSD), depression, and anxiety (Campbell et al., 2008; Decker et al., 2013; Hankin et al., 1999; Kimerling et al., 2007; Kimerling et al., 2010; Lang, Rodgers, et al., 2003; Maguen et al., 2012; K. M. Skinner et al., 2000; Turchik & Wilson, 2010). An analysis of Veterans Health Administration data on veterans with military sexual trauma (MST), females were 8.8 times more likely to be diagnosed with PTSD and 2.3 times as likely to be diagnosed with depressive disorders, while male veterans were 3.0 times as likely to be diagnosed with PTSD and twice as likely to be diagnosed with depressive disorders compared to veterans without MST.

Data from national samples indicate that sexual minority individuals are at heightened risk sexual violence in childhood (M. S. Friedman et al., 2011; T. Hughes et al., 2010); however, there is a dearth of information on risk for sexual violence throughout the life course among sexual minority individuals, including those in the military. Furthermore, national data indicate that sexual minority individuals have increased risk for mental health difficulties relative to heterosexual individuals (S. D. Cochran, 2001; S. D. Cochran et al., 2003), which may be explained by the minority stress model in which minorities experience increased stress resulting from stigma (Hatzenbuehler, 2009; Institute of Medicine, 2011; Meyer, 1995). Although sexual minority individuals have served in the US military despite a history of exclusionary policies, the Don't Ask Don't Tell (DADT) policy was only recently repealed (Bumiller, 2011; Burks, 2011); allowing service members to serve openly regarding their sexual orientation. Thus, there is a lack of sexual orientation research in the military, and the studies that exist are limited by their focus on the active army (Creel et al., 2013) or veterans (J. Blosnich et al., 2013; J. R. Blosnich et al., 2012; J. R. Blosnich, Mays, et al., 2014; J. R. Blosnich & Silenzio, 2013; Bolton & Sareen, 2011; Booth et al., 2011; B. N. Cochran et al., 2013) instead of the National Guard, and they tend to focus on the

perception, compatibility, and impact of LGB soldiers on unit cohesion, readiness, and effectiveness (A. X. Estrada et al., 2013; MacCoun, 1996; Moradi, 2009; Moradi & Miller, 2009) rather than the experience of sexual violence. Therefore, prevalence rates and risks associated with sexual violence in sexual minority service members are largely unknown. However, given historical institutional exclusionary policies such as DADT, stigma is likely a significant concern for sexual minority soldiers, and the stress associated with being a sexual minority in the military may interact with exposure to sexual violence to predict heightened risk for mental disorders.

To examine these questions, this study examines the prevalence of lifetime sexual violence and mental health correlates across dimensions of sexual orientation in a sample of Army National Guard soldiers. Based on data from national samples, we predicted that sexual minority service members would be more likely than non-minority service members to report exposure to sexual violence. We also predicted that sexual minority service members exposed to sexual assault would be more likely to report mental disorders than non-sexual minority service members exposed to sexual assault.

#### Material and methods

#### **Participants**

Participants for the current study are from the Ohio Army National Guard Mental Health Initiative (OHARNG MHI), a longitudinal prospective study of mental health in OHARNG soldiers. After excluding participants due to opting out of the study, having invalid or missing telephone numbers, age, retirement or non-English speaking, the final baseline enrollment was 2,616. Further details of the methods employed by the OHARNG MHI have been published elsewhere (Calabrese et al., 2011).

In order to replenish the study sample due to loss to follow-up, additional rounds of baseline interviews were conducted to replenish the baseline sample starting in 2010-2011 (n=578). A third round of baseline interviews for new participants (n=263) were administered in 2011-2012 and a fourth round (n=121) in 2014-2015.

## Data

In Wave 5 (2014-2015), three sexual orientation questions were added to the study survey to assess sexual identity, behavior and attraction. The analytic sample for the current study was limited to a total of 1,594 OHARNG soldiers who were administered the three sexual orientation questions and had a baseline survey. Of the 1,594 OHARNG soldiers who were administered the three sexual orientation questions, 3 participants refused to answer any of the sexual orientation questions, which brings the total analytic sample to 1,591. For the current study, the sexual orientation data from wave 5 were matched with the participants' baseline demographic, military, and mental health data which were administered between 2008 and 2015.

Trained interviewers administered structured telephone interviews lasting 60minutes using a computer assisted telephone interview (CATI) to assess for posttraumatic stress disorder (PTSD), depression, military and deployment experience, as well as demographic and health information. Verbal informed consent was obtained from all respondents; all were compensated for their time in participating in the study.

## Sexual Violence

A modified version of the Life Events Checklist from the Clinician Administered PTSD Scale (CAPS) was used to collect lifetime trauma exposure on each participant (Blake et al., 1995; F. W. Weathers et al., 1999). As part of the checklist, participants were asked, "In your lifetime, have you been 1. Raped? 2. Experienced another kind of sexual assault or unwanted sexual contact as a result of force, threat of harm, or manipulation?" Participants who affirmatively endorsed having experienced either of the two traumas were considered to have experienced lifetime sexual violence.

## Sexual Orientation

Sexual orientation was assessed using questions recommended by the Williams Institute through items regarding 3 dimensions: identity, behavior, and attraction (Sexual Minority Assessment Research Team, 2009). Respondents chose the sexual orientation identity that best described them: heterosexual or straight; gay or lesbian; or bisexual?" (Sell, 1996; Sexual Minority Assessment Research Team, 2009) Sexual behavior was ascertained with the question: "In the past (lifetime) who have you had sex with?" The answer options available were: men only; women only; both men and women; and I have not had sex (Sexual Minority Assessment Research Team, 2009). Respondents were also asked about their feelings of sexual attraction. Response categories were based on a continuum: only attracted to females; mostly attracted to females, equally attracted to females and males; mostly attracted to males; only attracted to males; and not sure (Mosher et al., 2005). A sexual minority category was created based on the three responses to sexual identity, attraction, and behavior. Participants were considered a sexual minority if they self-identified as gay, lesbian, or bisexual or if they had sexual behaviors with the same-sex or with both sexes or if they had some level of attraction to the same sex. Due to the restricted sample size, each dimension of sexual orientation was further aggregated to increase statistical power. Sexual identity was collapsed into a category gay, lesbian, bisexual (LGB) versus non-LGB. Sexual behavior was aggregated into same-sex behaviors, no same-sex behaviors, and no sexual behavior. Sexual attraction was grouped into categories same-sex attraction and no same-sex attraction, which was dependent on the participant's gender.

## Mental Health Disorders

We assessed PTSD and depression through the use of standardized assessments. Questions on timing were added to determine the time at which symptoms were present: past-year, lifetime. Assessment of mental health disorders was based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria (American Psychiatric Association, 2000).

PTSD was assessed through the administration of the PTSD Checklist-Civilian Version (PCL) (Blanchard et al., 1996). PTSD symptoms were asked in relation to two self-identified worse traumas: worst self-identified civilian trauma and the worst selfidentified deployment trauma from their most recent deployment. In order to be diagnosed with PTSD respondents must have endorsed: experiencing a traumatic event as well as intense fear, hopelessness, and horror due to trauma, having at least 1 symptom of re-experiencing the trauma, having at least 3 symptoms of avoidance of the trauma, at least 2 symptoms of hyperarousal, at least a duration of 1 month, of having significant impairment (F. Weathers et al., 1991). Depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), a 9item depression module (Kroenke & Spitzer, 2002; Kroenke et al., 2001). Respondents rated the severity of the depression symptoms from 1 = several days to 3 = nearly every day. To be diagnosed with depression, participants had to endorse 2 or more depression symptoms and at least 1 of the symptoms of having a depressed mood or anhedonia (Kroenke & Spitzer, 2002; Kroenke et al., 2001). Validation work on this study population suggests this broader definition of depression assessed on the PHQ-9 most closely corresponds to depression assessed in the clinical reappraisal sample (Calabrese et al., 2011; Marshall et al., 2012).

#### Analyses

Chi-square and Fisher's exact test were used to examine bivariate differences in non-heterosexual and heterosexual respondents across dimensions of sexual orientation. Multivariate logistic regression models predicting likelihood of experiencing sexual violence across various dimensions of sexual orientation while adjusting for demographic variables that were significantly different across sexual assault groups as well as based on prior research on National Guard (NG) soldiers (Calabrese et al., 2011; Marshall et al., 2013; Walsh et al., 2014). All models were adjusted for gender, race, age, marital status, household income, education, rank, most recent deployment location, total number of lifetime traumatic events, and wave of study entry. Multiple comparisons were not adjusted for in the analyses because of the increased risk of Type II error (Perneger, 1998; Rothman, 1990), given the small sample size of sexual minorities (n=127) in the current sample and limited statistical power. All analyses were conducted using SAS version 9.4 (SAS Institute, Cary, North Carolina). The National Guard Bureau, Office of Human Research Protections of the US Army Medical Research and Materiel Command, along with the institutional review boards of University Hospitals Case Medical Center, University of Toledo, University of Michigan, Boston University, and the Ann Arbor Veterans Administration Medical center approved the study protocol.

## Results

Of the 1,594 participants who were administered the sexual orientation questions during wave 5 and had a baseline survey, the majority of soldiers were white (87.3%), males (86.8%), and between the ages of 17-34 (68.8%). Nearly half of the soldiers were single (49.0%) and more than half had incomes less than \$60,000 (58.4%). Approximately half of the soldiers had some college or technical training (47.9%) and a majority were enlisted individuals (82.9%) with a little more than half ever being deployed (52.4%). Approximately 2.5% of the OHARNG sample identified as lesbian, gay, bisexual, or other; 3.4% reported having at least one same-sex partner in their lifetime; and 1.9% reported same-sex attraction (SSA). Overall, 8.0% of the OHARNG sample were considered sexual minority (SM).

Table 1 shows the demographic and military characteristics of the study sample stratified by lifetime sexual violence. Soldiers who experienced lifetime sexual violence were more likely to be female (54.4%), white (81.0%), single (47.6%), to have experienced 6-11 traumas (44.9%), and never deployed (51.7%). In terms of sexual identity (SI), LGB soldiers had nearly 4.5 times the prevalence of their heterosexual counterparts in reporting lifetime sexual violence (38.5% vs 8.5%, p<.0001). Likewise,

soldiers who have engaged in same-sex behavior (SSB) in their lifetime reported higher proportions of lifetime sexual violence (33.3% vs 8.5%, p<.001) as compared to soldiers who did not engage in same-sex behavior. Similarly, soldiers who reported any level of SSA reported greater lifetime sexual violence as compared to soldiers not reporting any level of SSA (32.2% vs 7.9%, p<.0001). When the three sexual orientation categories were collapsed into sexual minority status, a slightly lower proportion of sexual minorities reported lifetime sexual violence as compared to non-sexual minority soldiers (23.6% vs 8.0%, p<.0001).

Various dimensions of sexual orientation (identity, behavior, and attraction) were associated with lifetime sexual violence in unadjusted models (Table 2). Specifically, in terms of sexual identity (SI), LGB soldiers had nearly 4 (95% CI 1.60, 9.27) times the odds of reporting lifetime sexual violence compared to their heterosexual counterparts in adjusted models. Likewise, soldiers who have engaged in same-sex behavior (SSB) in their lifetime had 2.9 (95% CI 1.35, 6.23) times the odds of reporting lifetime sexual violence compared to soldiers who did not engage in same-sex behavior. Similarly, soldiers who reported any level of same-sex attraction (SSA) had 2.5 (95% CI 1.34, 4.69) times the odds of reporting lifetime sexual violence compared to soldiers not reporting any level of SSA. When the three sexual orientation categories were collapsed into sexual minority status, sexual minorities were twice (95% CI 1.12, 3.64) as likely to report lifetime sexual violence compared to non-sexual minority soldiers.

Moreover, dimensions of sexual orientation and experiencing lifetime sexual violence were associated with both lifetime and past-year PTSD (Table 3a) and

depression (Table 3b). In examining adjusted models of SM soldiers who experienced sexual violence in their lifetime were 4.3 (95% CI 1.53, 12.33) times more likely of reporting probable lifetime PTSD and 4.6 (95% CI 1.39, 13.23) times greater odds of past-year PTSD; 4.4 (95% CI 1.93, 10.19) times greater odds of lifetime depression and 3.4 (95% CI 1.43, 8.11) times greater odds of past-year depression as compared to heterosexual soldiers with no sexual violence. SM with sexual violence as compared to non-sexual minorities with sexual violence were at an increased risk of depression, but not PTSD. Adjusted models of SM soldiers who experienced sexual violence in their lifetime were 3.7 (95% CI 1.45, 9.63) times and 2.6 (95% CI 1.09, 6.28) times more likely of lifetime and past-year depression respectively as compared to heterosexual soldiers with sexual violence.

#### Discussion

This study is the first to document sexual violence across dimensions of sexual orientation in a representative sample of NG soldiers. Approximately 1 in 5 sexual minority service members reported lifetime sexual violence. Across specific dimensions of sexual orientation, 32.2%-38.5% of sexual minority soldiers reported lifetime sexual violence. Furthermore, sexual minority status and reporting lifetime sexual violence was associated with increased risk of lifetime and past-year PTSD and depression. Moreover, the dimension with the greatest risk of reporting sexual violence as well as increased risk for lifetime and past-year PTSD were soldiers who self-identified as LGB, which might be attributed to stigma and prejudice that these individuals may have experienced during their lifetime by identifying their sexual preference (Herek, 2007).

In a study of NG soldiers, which did not take into account sexual orientation, 7.4% reported lifetime sexual violence (Walsh et al., 2014); our study sample reported a slightly higher prevalence of lifetime sexual violence (8%). However, among sexual minority service members, the prevalence of lifetime sexual violence was substantially higher (23.6%), with 38.5% of those identifying as LGB reporting lifetime sexual violence. However, similar to studies of sexual minority veterans, we observed higher prevalences of mental health and sexual violence in non-heterosexual NG soldiers (J. Blosnich et al., 2013; J. R. Blosnich, Gordon, & Fine, 2015; Booth et al., 2011; B. N. Cochran et al., 2013; Herrell et al., 1999). These findings suggest that dimension of sexual orientation may moderate depression among individuals with sexual violence. Furthermore, our study confirms previous research that health risks and benefits of one dimension of sexual orientation may not extrapolate to another dimension of sexual orientation (Matthews et al., 2014; McCabe et al., 2009).

The minority stress model, which posits an individual belonging to a stigmatized group experiences increased stress from their stigmatization, has been offered as an explanation for the higher prevalence of anxiety disorders and depression among sexual minorities as compared with heterosexual individuals (Institute of Medicine, 2011; Meyer, 1995, 2003). Furthermore, being in the military, in particular being in the NG, has been associated with unique stressors. For example, reserve soldiers are often deployed separately from the unit in which they train, and they maintain a civilian job while deployed (Griffith, 2011). In addition, with Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), there have been many more reservists being called to active duty, with nearly 500,000 of the 1.2 million US reservists have been mobilized

and deployed (Bonds et al., 2010). Moreover, the Don't Ask, Don't Tell policy was only recently repealed, which may have conferred its own unique stressors upon sexual minorities in the military; such as fear of being discharged from the military due to their sexual orientation (Burks, 2011). In our study, soldiers who identified as LGB and experienced lifetime sexual violence had an increased risk of lifetime and past-year PTSD and depression, which supports the minority stress model that being a sexual minority in the military exacerbates the already negative effects of sexual violence.

## Limitations

Several limitations of the current study must be noted. First, the aggregation of each dimension of sexual orientation to increase statistical power may obscure differences among each SM subgroup (Matthews et al., 2014) as prior research has indicated differences between Gay/Lesbians and Bisexual individuals (T. L. Hughes et al., 2001; Matthews et al., 2014; McCabe et al., 2003; McCabe et al., 2004; W. F. Skinner & Otis, 1996; Wilsnack et al., 2007). Despite aggregating the groups, the number of sexual minority OHARNG soldiers in the current study was small and may limit generalizability to other National Guard populations as well as limit the statistical power of the study. Second, due to the cross-sectional nature of the current study, causation could not be inferred for the observed differences. Moreover, only wave 5 of the OHARNG MHI included questions on sexual orientation; therefore, temporal ordering cannot be established. Fourth, the use of telephone interview methodology instead of self-report of sexual orientation may have led to underreporting due to the stigma surrounding mental health (Greene-Shortridge et al., 2007; C. W. Hoge et al., 2004; Kim

et al., 2010; R. H. Pietrzak et al., 2009) and sexual orientation in a military culture (Haggerty, 2003; Rostker et al., 1993). Fifth, the current study included the assessment of the three constructs of sexual orientation which were measured using different timeframes. Both the sexual identity and sexual attraction questions did not specify a timeframe whereas the sexual behavior questions were asked over the soldier's lifetime, in contrast to other studies that have used past-year or past-5-year measures (S. D. Cochran & Mays, 2000b; Gilman et al., 2001; Sandfort et al., 2001). Sixth, it was assumed that sexual orientation status remained static instead of being a dynamic characteristic. Finally, the sexual behavior question did not assess the number of sexual partners, nor if it was consensual or forced. Due to the manner in which sexual orientation is operationalized, comparisons across studies may seemingly yield different results, such as utilizing different references of time frames in screening the participants, which emphasizes the importance standardizing sexual orientation measures (Institute of Medicine, 2011).

Despite these limitations, the current study represents a novel and much-needed investigation into associations between sexual orientation and lifetime sexual violence exposure in the OHARNG. Compared with other studies of sexual orientation and mental health in the military, the current study has several strengths. We used a representative sample from the OHARNG rather than a convenience sample. Also, sexual orientation was assessed across three dimensions instead of the use of a single question. Furthermore, the current study not only assessed lifetime psychopathology, but also pastyear.

## Conclusions

The findings from this research begin to address important gaps in both military and sexual minority research. The present study has important implications for the assessment of sexual violence and associated mental health consequences. Health care providers and military agencies may be missing an important facet of information in the treatment of mental health disorders as both sexual violence and sexual orientation may be contributing to mental health disorders. Additional research on military sexual minorities are needed to replicate and confirm study results.

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				Lifetime	Sexua	l Violen	ce
	Overall (	N = 1594)	Yes	(n=147)	No (n	=1444)	
Characteristics	n	%	n	%	n	%	p-value
Gender							
Male	1383	86.76	67	45.58	1315	91.07	<.0001
Female	211	13.24	80	54.42	129	8.93	
Race							
White	1392	87.33	119	80.95	1270	88.19	0.035
Black	114	7.15	15	10.20	99	6.88	
Other	84	5.27	13	8.84	71	4.93	
Age							
17-24	645	40.46	51	34.69	594	41.14	0.339
25-34	452	28.36	47	31.97	402	27.84	
35-44	335	21.02	36	24.49	299	20.71	
45+	162	10.16	13	8.84	149	10.32	
Marital Status							
Married	689	43.41	57	38.78	630	43.63	0.016
Divorced/Separated/Widowed	123	7.73	20	13.61	102	7.06	
Single	779	48.96	70	47.62	712	49.31	
Household Income							
≤ \$20,000	260	16.31	25	17.12	235	16.40	0.134
\$20,001 - \$40,000	331	20.77	40	27.40	290	20.24	
\$40,001 - \$60,000	339	21.27	27	18.49	312	21.77	
\$60,001 - \$80,000	262	16.44	16	10.96	244	17.03	
≥ \$80,001	390	24.47	38	26.03	352	24.56	
Education							
Less than high school	27	1.69	2	1.36	25	1.73	0.194
High School Graduate/GED	352	22.08	23	15.65	329	22.78	
Some college or technical training	763	47.87	73	49.66	688	47.65	
College graduate/Graduate Work/Graduate	452	28.36	49	33.33	402	27.84	
Rank							
Enlisted	1321	82.87	119	80.95	1199	83.03	0.649
Warrant Officer	226	14.18	2	1.36	22	1.52	
Officer	24	1.51	25	17.01	201	13.92	
Other	23	1.44	1	0.68	22	1.52	
Most Recent Deployment Location							

 Table 1 – Demographic Characteristics Stratified by Lifetime Sexual Violence

Never deployed	759	47.62	76	51.70	681	47.16	0.552
Nonconflict area	432	25.28	38	25.85	394	27.29	
Conflict Area	403	27.10	33	22.45	369	25.55	
Total Number of all traumatic events							
0	119	7.47	0	0.00	119	8.24	<.0001
1-5	607	38.08	32	21.77	575	39.82	
6-11	500	31.37	66	44.90	432	29.92	
12+	368	23.09	49	33.33	318	22.02	
Number of Lifetime Deployments							
0	759	47.62	76	51.70	681	47.16	0.009
1	398	24.97	46	31.29	352	24.38	
2 or more	437	27.42	25	17.01	411	28.46	
Sexual Identity							
Sexual Identity LGB	39	2.45	15	10.20	24	1.67	<.0001
Sexual Identity LGB Non-LGB	39 1552	2.45 97.37	15 132	10.20 89.80	24 1417	1.67 98.33	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior	39 1552	2.45 97.37	15 132	10.20 89.80	24 1417	1.67 98.33	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior	39 1552 54	2.45 97.37 3.39	15 132 18	10.20 89.80 12.24	24 1417 36	1.67 98.33 2.50	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior	39 1552 54 1495	2.45 97.37 3.39 93.79	15 132 18 127	10.20 89.80 12.24 86.39	24 1417 36 1365	1.67 98.33 2.50 94.79	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior No Sexual Behavior	39 1552 54 1495 41	2.45 97.37 3.39 93.79 2.57	15 132 18 127 2	10.20 89.80 12.24 86.39 1.36	24 1417 36 1365 39	1.67 98.33 2.50 94.79 2.71	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior No Sexual Behavior Sexual Attraction	39 1552 54 1495 41	2.45 97.37 3.39 93.79 2.57	15 132 18 127 2	10.20 89.80 12.24 86.39 1.36	24 1417 36 1365 39	1.67 98.33 2.50 94.79 2.71	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior No Sexual Behavior Sexual Attraction Same-Sex Attraction	39 1552 54 1495 41 87	2.45 97.37 3.39 93.79 2.57 5.46	15 132 18 127 2 28	10.20 89.80 12.24 86.39 1.36 19.05	24 1417 36 1365 39 59	1.67 98.33 2.50 94.79 2.71 4.10	<.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior No Sexual Behavior Sexual Attraction Same-Sex Attraction No Same-Sex Attraction	39 1552 54 1495 41 87 1503	2.45 97.37 3.39 93.79 2.57 5.46 94.29	15 132 18 127 2 28 119	10.20 89.80 12.24 86.39 1.36 19.05 80.95	24 1417 36 1365 39 59 1381	1.67 98.33 2.50 94.79 2.71 4.10 95.90	<.0001 <.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior No Sexual Behavior Sexual Attraction Same-Sex Attraction No Same-Sex Attraction Sexual Minority	39 1552 54 1495 41 87 1503	2.45 97.37 3.39 93.79 2.57 5.46 94.29	15 132 18 127 2 28 119	10.20 89.80 12.24 86.39 1.36 19.05 80.95	24 1417 36 1365 39 59 1381	1.67 98.33 2.50 94.79 2.71 4.10 95.90	<.0001 <.0001
Sexual Identity LGB Non-LGB Sexual Behavior Same-Sex Behavior No Same-Sex Behavior No Sexual Behavior Sexual Attraction Same-Sex Attraction No Same-Sex Attraction No Same-Sex Attraction	39 1552 54 1495 41 87 1503	2.45 97.37 3.39 93.79 2.57 5.46 94.29 7.97	15 132 18 127 2 28 119 30	10.20 89.80 12.24 86.39 1.36 19.05 80.95 20.41	24 1417 36 1365 39 59 1381 97	1.67 98.33 2.50 94.79 2.71 4.10 95.90 6.73	<.0001 <.0001 <.0001

\* 3 participants were excluded from the analyses as they did not respond to any of the sexual orientation questions Not all values add up to 100% due to missing values

		Unadj	usted			Adju	sted	
	Lif	etime Sex	ual Violen	ce	Lif	etime Sex	ual Violen	ce
		626	6 CI			626	é CI	
Dimensions of Sexual Orientation	OR	Lower CI	Upper CI	p-value	AOR	Lower CI	Upper CI	p-value
Sexual Identity								
LGB vs Non LGB	6.71	3.44	13.10	<.001	3.85	1.60	9.27	0.003
Sexual Behavior								
Same Sex Behavior vs No Same Sex Behavior	5.37	2.97	9.74	<.0001	2.90	1.35	6.23	0.007
No Sexual Behavior vs No Same Sex Behavior	0.55	0.13	2.31	0.415	0.30	0.04	2.41	0.257
Sexual Attraction								
Same Sex Attraction vs No Same Sex Attraction	5.51	3.38	8.97	<.0001	2.51	1.34	4.69	0.004
Sexual Minority								
Sexual Minority vs No Sexual Minority	3.56	2.27	5.59	<.0001	2.01	1.12	3.64	0.020
OR = Odds Ratio, AOR = Adjusted Odds Ratio								

Table 2 – Odds Ratio and Adjusted Odds Ratios of Lifetime Sexual Violence and Dimensions of Sexual Orientation

		Unadju	isted			Adjus	ted			Unadju	sted			Adjus	ed	
		PTSD Li	fetime			PTSD Li	fetime			PTSD Pa	st Year			PTSD Pa	t Year	
		95%	6 CI			95%	6 CI			95%	S CI			95%	CI	
Condition	OR	Lower CI	Upper CI	p-value	AOR	LowerCI	Upper CI	p-value	OR	Lower CI	Upper CI	p-value	AOR	Lower CI	Upper CI	o-value
Sexual Identity + Sexual Violence																
LGB + No SV vs Non LGB + No SV	2.67	0.78	9.16	0.119	3.56	0.92	13.86	0.067	3.47	1.01	11.98	0.049	6.01	1.50	24.12	0.012
Non LGB + SV vs Non LGB + No SV	5.49	3.43	8.80	<.0001	3.50	1.94	6.29	<.0001	4.34	2.52	7.49	<.0001	2.93	1.48	5.80	0.002
LGB + SV vs Non LGB + No SV	6.79	2.11	21.86	0.001	4.87	1.29	18.41	0.020	6.08	1.67	22.14	0.006	5.10	1.14	22.90	0.002
LGB + SV vs Non LGB + SV	1.24	0.37	4.17	0.732	1.39	0.37	5.27	0.625	1.40	0.36	5.41	0.626	1.74	0.39	7.79	0.469
Same Sex Behavior + Sexual Violence																
Same Sex Behavior + No SV vs No Same Sex Behavior + No SV	2.31	0.80	6.72	0.124	2.32	0.73	7.38	0.154	3.04	1.04	8.89	0.043	3.83	1.16	12.58	0.027
No Sexual Behavior + No SV vs No Same Sex Behavior + No SV	0.49	0.07	3.60	0.481	0.73	0.09	5.82	0.764	0.64	0.09	4.74	0.661	0.94	0.11	7.78	0.957
No Same Sex Behavior + SV vs No Same Sex Behavior + No SV	5.72	3.56	9.20	<.0001	3.50	1.93	6.33	<.0001	4.54	2.62	7.86	<.0001	2.97	1.50	5.90	0.002
Same Sex Behavior + SV vs No Same Sex Behavior + No SV	5.29	1.70	16.48	0.004	4.24	1.17	15.36	0.028	4.86	1.37	17.28	0.015	4.66	1.07	20.31	0.041
No Sexual Behavior + SV vs No Same Sex Behavior + No SV																
Same Sex Behavior + SV vs No Same Sex Behavior + SV	0.92	0.28	3.02	0.00	1.21	0.33	4.42	0.77	1.07	0.28	4.04	0.92	1.57	0.36	6.84	0.55
Same Sex Attraction + Sexual Violence																
SSA + No SV vs No SSA + No SV	1.73	0.67	4.47	0.255	1.57	0.57	4.32	0.387	2.28	0.88	5.92	0.092	2.40	0.85	6.81	0.099
No SSA + SV vs No SSA + No SV	5.50	3.36	8.99	<.0001	3.39	1.85	6.19	<.0001	4.38	2.48	7.75	<.0001	2.84	1.41	5.71	0.003
SSA + SV vs No SSA + No SV	6.24	2.57	15.18	<.0001	4.49	1.57	12.84	0.005	5.34	1.96	14.59	0.001	4.79	1.44	15.97	0.011
SSA + SV vs No SSA + SV	1.14	0.44	2.96	0.794	1.33	0.47	3.78	0.598	1.22	0.41	3.63	0.721	1.69	0.51	5.61	0.393
Sexual Minority + Sexual Violence																
SM + No SV vs No SM + No SV	1.22	0.52	2.88	0.653	1.42	0.56	3.58	0.459	1.61	0.67	3.84	0.286	2.10	0.81	5.44	0.126
No SM + SV vs No SM + No SV	5.54	3.38	9.08	<.0001	3.38	1.85	6.19	<.0001	4.43	2.50	7.85	<.0001	2.84	1.41	5.73	0.004
SM + SV vs No SM + No SV	5.62	2.33	13.56	0.000	4.34	1.53	12.33	0.006	4.87	1.80	13.23	0.002	4.58	1.39	15.11	0.012
SM + SV vs No SM + SV	1.01	0.39	2.62	0.976	1.28	0.45	3.64	0.638	1.10	0.37	3.25	0.863	1.61	0.49	5.31	0.431
LGB = Les bian. Gav. Bisexual. SV=Sexual Violence. SSA= Same-sex Attraction. SM=Sexual I	Minority															

# Table 3a – Odds Ratio and Adjusted Odds Ratios of Dimensions of Sexual Orientation with Lifetime Sexual Violence and Lifetime and Past-Year PTSD

		Unadju	usted			Adjus	ted			Unadju	sted			Adjus	ted	
		Jepre ssior	ı Lifetime		1	Depression	Lifetime		ŏ	epression	Past Year		Ď	epression	Past Year	
		959	é CI			95%	CI			95%	CI			95%	CI	
Condition	OR	Lower CI	Upper CI	p-value	AOR	Lower CI	Upper CI	p-value	OR	Lower CI	Upper CI	p-value	AOR	Lower CI	Upper CI	o-value
Sexual Identity + Sexual Violence																
LGB + No SV vs Non LGB + No SV	1.25	0.46	3.39	0.657	1.61	0.56	4.64	0.377	0.72	0.17	3.11	0.665	0.76	0.17	3.43	0.723
Non LGB + SV vs Non LGB + No SV	2.72	1.86	3.98	<.0001	1.81	1.15	2.84	0.010	1.68	1.04	2.72	0.034	1.04	0.59	1.82	0.900
LGB + SV vs Non LGB + No SV	4.17	1.50	11.59	0.006	3.53	1.15	10.83	0.027	5.32	1.87	15.14	0.002	4.09	1.30	12.90	0.016
LGB + SV vs Non LGB + SV	1.53	0.52	4.49	0.437	1.95	0.62	6.14	0.252	3.16	1.03	9.76	0.045	3.95	1.20	13.04	0.024
Same Sex Behavior + Sexual Violence																
Same Sex Behavior + No SV vs No Same Sex Behavior + No SV	1.83	0.87	3.85	0.111	2.01	0.91	4.47	0.086	1.58	0.65	3.87	0.312	1.44	0.56	3.72	0.452
No Sexual Behavior + No SV vs No Same Sex Behavior + No SV	0.54	0.19	1.55	0.253	0.64	0.21	1.96	0.436	0.21	0.03	1.53	0.123	0.19	0.03	1.47	0.111
No Same Sex Behavior + SV vs No Same Sex Behavior + No SV	2.70	1.83	3.98	<.0001	1.82	1.15	2.89	0.011	1.66	1.02	2.71	0.042	1.02	0.57	1.81	0.952
Same Sex Behavior + SV vs No Same Sex Behavior + No SV	4.76	1.87	12.12	0.001	3.82	1.39	10.47	0.00	5.04	1.93	13.20	0.001	3.93	1.36	11.36	0.011
No Sexual Behavior + SV vs No Same Sex Behavior + No SV																
Same Sex Behavior + SV vs No Same Sex Behavior + SV	1.76	0.65	4.75	0.26	2.10	0.74	5.96	0.17	3.04	1.06	8.71	0.04	3.87	1.26	11.85	0.02
Same Sex Attraction + Sexual Violence																
SSA + No SV vs No SSA + No SV	2.16	1.22	3.83	0.008	2.66	1.42	4.96	0.002	1.68	0.83	3.38	0.149	1.70	0.80	3.62	0.166
No SSA + SV vs No SSA + No SV	2.40	1.60	3.61	<.0001	1.70	1.06	2.74	0.028	1.46	0.86	2.48	0.159	0.95	0.52	1.73	0.858
SSA + SV vs No SSA + No SV	6.57	3.07	14.06	<.0001	5.17	2.20	12.14	0.000	5.31	2.44	11.56	<.0001	3.91	1.62	9.45	0.002
SSA + SV vs No SSA + SV	2.73	1.18	6.34	0.019	3.04	1.25	7.41	0.015	3.63	1.46	9.02	0.005	4.14	1.59	10.79	0.004
Sexual Minority + Sexual Violence																
SM + No SV vs No SM + No SV	1.43	0.87	2.35	0.159	1.86	1.08	3.21	0.027	1.03	0.54	1.97	0.939	1.06	0.53	2.13	0.872
No SM + SV vs No SM + No SV	2.44	1.62	3.67	<.0001	1.69	1.05	2.73	0:030	1.46	0.86	2.48	0.163	0.91	0.50	1.67	0.767
SM + SV vs No SM + No SV	5.56	2.68	11.56	<.0001	4.43	1.93	10.19	0.001	4.64	2.17	9.95	<.0001	3.41	1.43	8.11	0.006
SM + SV vs No SM + SV	2.29	1.01	5.16	0.047	2.62	1.09	6.28	0.031	3.18	1.30	7.80	0.011	3.73	1.45	9.63	0.006
1.GB = Lesbian. Gav. Bisexual. SV=Sexual Violence. SSA= Same-sex Attraction. SM=Sexual	Minority															

Table 3b - Odds Ratio and Adjusted Odds Ratios of Dimensions of Sexual Orientation with Lifetime Sexual Violence and Lifetime and Past-Year Depression

## **CHAPTER 7**

Depressive Trajectories and Sexual Minority Status as a Predictor in Ohio Army National Guard Soldiers

## Abstract

*Background:* Depression is associated with poor psychosocial outcomes. However, depression has been given less attention than PTSD in US military personnel. Less is known about sexual minority status on the long-term course of depressive symptoms in military personnel.

*Purpose:* To characterize the natural course of depressive symptoms among a National Guard (NG) population followed for 5 waves and sexual minority status as a predictor of trajectory group membership.

*Methods:* Data from the Ohio Army National Guard Mental Health Initiative (OHARNG MHI) measured depressive symptoms using the Patient Health Questionnaire-9 (PHQ-9) among 1,473 Ohio National Guard members. Distinct trajectories of depressive symptoms were identified using a semi-parametric group based approach and examined their association with baseline risk factors of depression.

*Results:* Six distinct trajectories for depressive symptoms were identified. 62.9% of NG soldiers were resistant to depressive symptoms and 10.7% were resilient across all 5 waves. Chronic dysfunction constituted the smallest trajectory group (5.4%). Increased number of traumatic lifetime events and sexual minority status were associated with membership into different latent groups of depression.

*Conclusions:* Consistent with previous cross-sectional studies, the observed longitudinal disparities were largest for sexual minorities and support the minority stress theory. Results suggest the need to take into account sexual minority status and the number of lifetime traumatic in treating depressive symptoms in NG soldiers.

## Introduction

Posttraumatic stress disorder (PTSD) has been extensively studied in US military personnel with most research beginning after the Vietnam War. With soldiers returning from Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), research on the development and epidemiology of PTSD has continued (Bryan & Heron, 2015; Calabrese et al., 2011; Felker, Hawkins, Dobie, Gutierrez, & McFall, 2008; C. W. Hoge et al., 2004; Maguen et al., 2006; Karen H Seal et al., 2009; T. C. Smith et al., 2008; Wells et al., 2011). In contrast, depression has received less attention than PTSD in OIF and OEF military personnel (Bryan & Heron, 2015; Gadermann et al., 2012). Initially, depression appeared to be less prevalent than PTSD with rates between 2-10% (Tanielian & Jaycox, 2008). As the wars in Iraq and Afghanistan progressed, more recent studies suggest the prevalence of depression among OIF and OEF veterans range from 12-24% (Elbogen et al., 2014; Gadermann et al., 2012; C. W. Hoge et al., 2004; Karen H Seal et al., 2009; Tanielian & Jaycox, 2008; Thomas et al., 2010; Wells et al., 2010). The results of these past studies may suggest that depression has a delayed onset in some military personnel and the prevalence of depression may be more common than PTSD (Bryan & Heron, 2015).

It has been documented that exposure to stressful life events has been associated with depression (Monroe & Hadjiyannakis, 2002) and depression is one of the most common complaints after military deployment (Winfield & Lafferty, 1997). Depression is a serious and burdensome mental health disorder which is associated with higher rates of chronic disease, increased health care utilization, and functional impairment (Katon, 2003). Approximately, 6.6%-7.6% of Americans aged 18 and over has depression in a

given year (Center for Behavioral Health Statistics and Quality, 2015; Kessler, Chiu, et al., 2005; Pratt & Brody, 2014).

Population studies on sexual minorities suggest higher rates of depression and depressive disorders among Lesbian, Gay, and Bisexual (LGB) individuals. Results from the National Household of Drug Abuse found that men who have sex with men were more likely than exclusively heterosexual men to be diagnosed with depression. A study conducted by Cochran et al found that gay and bisexual men were 3.0 times as likely to be diagnosed with depression as heterosexual men (S. D. Cochran et al., 2003). Furthermore, study results from the National Comorbidity Survey (NCS) show women with any same-sex partner had significantly higher 12-month prevalence of depression (Gilman et al., 2001).

Individuals who have depression may not experience every symptom as some may experience a few while others many. In addition, the severity and frequency of depression symptoms varies depending on the individual as well as the stage of the illness (National Institute of Mental Health, 2016). Therefore, this results in varying trajectories of depression being observed. Prior studies on trajectories of mental health have concentrated on civilian populations and less research has been conducted on trajectories of mental health in military populations, (Lowe et al., 2014; Nandi et al., 2009; R. Pietrzak et al., 2014) as there is currently only one study that exists on trajectories of depression in a National Guard (NG) population (Sampson et al., 2015). Additionally, only a handful of studies have examined the mental health of sexual minorities (SM) longitudinally and have been primarily on mental health and substance use trajectories in adolescents (Marshal et al., 2013; Marshal et al., 2009; Needham, 2012; Pollard et al.,

2011; Russell et al., 2002). The lack of military research on SM's is understandable due to previous military policies which prevented sexual minorities to serve openly. The repeal of the Don't Ask, Don't Tell (DADT) policy (10 USC § 654) by President Obama in 2011 provides a unique opportunity to study military sexual minorities by allowing soldiers to be open about their sexuality without fear of discharge from the military. Given the paucity of SM military research coupled with a dearth of mental health trajectory analyses in a National Guard population, this study, to the best of our knowledge, is the first to examine trajectories of depressive symptoms overtime and sexual minority status as a predictor of trajectory group membership in a NG sample.

#### Methods

#### **Participants**

The current study uses data from Wave 1 through 5 of the Ohio Army National Guard Mental Health Initiative (OHARNG MHI), a representative longitudinal prospective study of mental health in OHARNG soldiers. After excluding participants due to opting out of the study, having invalid or missing telephone numbers, age, retirement or non-English speaking, the final baseline enrollment was 2,616. Further details of the methods employed by the OHARNG MHI have been published elsewhere (Calabrese et al., 2011).

In order to replenish the study sample due to loss to follow-up, additional rounds of baseline interviews were conducted to replenish the baseline sample starting in 2010-2011 (n=578). A third round of baseline interviews for new participants (n=263) were administered in 2011-2012 and a fourth round (n=121) in 2014-2015. In order to be included in the current study sample (n = 1,473), participants must have responded to the three sexual orientation questions which were administered during wave 5 of the study and participated in at least 2 out of the 5 waves of the study.

## Depression

Past-year depression was assessed using the Patient Health Questionnaire-9 (PHQ-9), a 9-item depression module (Kroenke & Spitzer, 2002; Kroenke et al., 2001). Symptom counts ranged from 0 to 9. Total symptom count for each participant was calculated based on symptoms considered positive if participants endorsed "more than half the time" during the past 30 days for a period of 2 weeks. To be diagnosed with depression, participants had to endorse 2 or more depression symptoms and at least 1 of the symptoms of having a depressed mood or anhedonia (Kroenke & Spitzer, 2002; Kroenke et al., 2001). This definition of depression includes the DSM-IV diagnosis of major depressive disorder. Validation work on this study population suggests this broader definition of depression assessed on the PHQ-9 most closely corresponds to depression assessed in the clinical reappraisal sample (Calabrese et al., 2011; Prescott et al., 2014).

#### *Time-Stable Covariates – Risk Factors*

Lifetime traumatic events were based on respondents positively endorsing events from the Life Events Checklist from the Civilian Administered PTSD Scale (CAPS) (Gray et al., 2004; F. W. Weathers et al., 1999), the Deployment Risk and Resilience Inventory (L. A. King, King, Vogt, Knight, & Samper, 2006), as well as events that were

suggested by Breslau et al (Breslau et al., 1998). A binary variable for lifetime traumatic events was created based on the median count of lifetime traumatic events, which was 6. Therefore, the binary variable was defined as greater than or equal to 6 lifetime traumatic events or not greater than or equal to 6 lifetime traumatic events.

A binary variable for age was created with individuals between the ages of 17-25 to be considered young. The unmarried category is defined as being never married. The education variable was based on individuals reporting earning a high school diploma/GED or less. A binary variable of being deployed to a conflict area. Participants were considered deployed to an area of conflict if they were deployed to Iraq or Afghanistan.

Sexual orientation was assessed using three items regarding identity, behavior, and attraction (Sexual Minority Assessment Research Team, 2009). Respondents chose the sexual orientation identity that best described them: heterosexual or straight; gay or lesbian; or bisexual?" (Sell, 1996; Sexual Minority Assessment Research Team, 2009) Sexual behavior was ascertained with the question: "In the past (lifetime) who have you had sex with?" The answer options available were: men only; women only; both men and women; and I have not had sex (Sexual Minority Assessment Research Team, 2009). Respondents were also asked about their feelings of sexual attraction. Response categories were based on a continuum: only attracted to females; mostly attracted to females, equally attracted to females and males; mostly attracted to males; only attracted to males; and not sure (Mosher et al., 2005). A sexual minority category was created based on the three responses to sexual identity, attraction, and behavior. Participants were considered a sexual minority if they self-identified as gay, lesbian, or bisexual or if

they had sexual behaviors with the same-sex or with both sexes or if they had some level of attraction to the same sex.

## Procedure

This study protocol was approved by The National Guard Bureau, Office of Human Research Protections of the US Army Medical Research and Materiel Command, along with the institutional review boards of University Hospitals Case Medical Center, University of Toledo, University of Michigan, Boston University, and the Ann Arbor Veterans Administration Medical center. Trained interviewers administered structured telephone interviews lasting 60-minutes using a computer assisted telephone interview (CATI). Verbal informed consent was obtained from all respondents; all were compensated for their time in participating in the study.

#### Data Analysis

Baseline demographic variables for the study sample include gender, age, race (White, Black, Other), educational attainment (less than high school, high school graduate/GED, some college or technical training, college graduate/graduate work/graduate degree), income ( $\leq$  \$20,000, \$20,001-\$40,000, \$40,001-\$60,000, \$60,001-\$80,000,  $\geq$  \$80,0001) relationship status (married, divorced/separated/widowed), military rank (enlisted, warrant officer, officer, other), most recent deployment location (never deployed, nonconflict area, conflict area), number of lifetime deployments (0, 1, 2 or more), and total number of traumatic events (0, 1-5, 6-11, 12 or more). Due to having loss to follow-up across the five waves of data, it was necessary to determine if the missing data was missing completely at random (MCAR), Little's MCAR test was conducted. The analysis revealed that the data was not MCAR ( $\chi^2$ = 49.060, df = 30, p = 0.015). However, the methods employed to analyze the current data utilizes all available data to estimate other missing data points under the missing at random (MAR) assumption (D. Nagin, 2009). The assumption of MAR often has minor impact on analyses (Collins, Schafer, & Kam, 2001). Therefore, the missing data points in the current data set were assumed to be MAR.

We used Proc Traj in SAS 9.4 to examine developmental trajectories of depression in a 1,473 National Guard soldiers. Proc Traj, is a semi-parametric, groupbased modeling approach used to identify distinct clusters of developmental trajectories within a population (D. S. Nagin, 1999). In selecting the best model, the Bayesian Information Criterion (BIC) is generally used when testing latent class growth models (Laub et al., 1998) to determine the optimal number of groups (Jones & Nagin, 2007; Jones et al., 2001). In simulations, the BIC performed the best among the information criteria-based indices (Collins et al., 1993; Hagenaars & McCutcheon, 2002; Magidson & Vermunt, 2004; Nylund et al., 2007), such as the Akaike's Information Criterion (AIC). Furthermore, simulations studies have shown the adjusted BIC (Sclove, 1987) is superior to other information criteria statistics (C.-C. Yang, 2006).

There are two manners in which the BIC can be used to evaluate the number of trajectory groups. First, the change in the BIC between two models measures the weight of evidence against the null model that is used. As models with more groups are tested, the BIC of the more complex model is compared against the null model by taking the

difference in the BIC values to determine the change. The largest change in BIC between the two models (complex vs null) is used to determine the best fitting model (Jones et al., 2001). Second, the estimate of the log Bayes Factor is approximately equal to two times the difference in BIC values; comparing a more complex model to a simpler model (Jones et al., 2001). Therefore, changes in the log Bayes Factor greater than 10 indicates a better fit of the model (Norris et al., 2009). Following the fitting of a model using Proc Traj, the shape of each trajectory group (i.e. intercept, linear, quadratic, cubic) is fit based on statistical significance (p < 0.05). Proc Traj permits models up to the fourth polynomial and model both linear and non-linear trajectories (Arrandale et al., 2006; Jones et al., 2001). Respondents are assigned to the trajectory for which the individual's behavior best conforms (Muthén & Shedden, 1999).

Proc Traj accommodates missing data and does not drop participants with incomplete data. The time between assessment periods does not have to be equally spaced and assessment periods do not need to be identical across participants (D. S. Nagin, 1999). The repeated measure of past-year depression symptoms were modeled as a zero inflated-Poisson due to the fact that we are dealing with count data which contains more zeroes than the Poisson assumption (Lambert, 1992).

Trajectory group probabilities varied as a function of 5 risk factors for depression: young age (17-25), unmarried, lower education, deployed to an area of conflict, and dimensions of sexual orientation (S. D. Cochran et al., 2003; Gadermann et al., 2012; Gilman et al., 2001; Sampson et al., 2015). The inclusion of time-stable risk factors were based on prior empirical evidence and statistically significant covariates. By including the risk factors directly into the model it accounts for assignment uncertainty automatically (Jones et al., 2001). The classify and analyze approach in which one classifies the groups and then analyzes group assignment by regression methods introduces bias and does not account for uncertainty in group assignment (Clogg, 1995; Roeder, Lynch, & Nagin, 1999). The reference groups for calculating trajectory group membership as a function of risk factors was based on the resistant group trajectory. Each estimate can be interpreted as the log of the odds ratio of the impact of the particular risk factor on the probability of membership in the specified group relative to the resistant group (Jones & Nagin, 2007).

#### Results

Our study sample contained 1,473 participants based on our inclusion criteria for entry into the study. 87.2% of the study population are male, white (88.0%) and above the age of 26 (62.0%). 47.1% of the study population has never been married, 22.5% has a high school education or less, and 44.8% has never been deployed. The majority of the study sample were enlisted rank (82.8%). In terms of dimensions of sexual orientation: 2.1% self-identified as LGB, 3.2% reported a same sex partner in their lifetime, and 5.3% reported some level of same-sex attraction. In this study population, approximately 7.0% are considered a sexual minority.

Table 1 gives the BIC values and difference in log Bayes Factor for models with varying number of groups for our study sample of NG soldiers. Given that we do not know the number of depression trajectory groups a priori, the reference groups for calculating group membership were based on the resistant group trajectory. When an 8 group model is fit, there is a decrease in fit, therefore, ideally, the optimal number of
groups would be one less than 8 groups. However, upon evaluating a 7 group model, singular convergence problems occurred. Therefore, there is strong evidence that the optimal number of trajectory groups is a 6 group model to fit depression symptom count with a log Bayes Factor of 81.10.

Figure 1 shows a graph of the predicted number of depression symptoms across the 5 time points. The resistant group is by far the largest (62.9% - Group 2), followed by the resilient group (10.7% - Group 4), 10.2% were considered to be a part of the recovery group (Group 5), 7.0% of NG soldiers were classified as delayed dysfunction (Group 1), 5.4% had chronic dysfunction throughout the study period (Group 6), and 3.8% exhibited an increasing (mild) number of depression symptoms (Group 3). Individuals in the chronic dysfunction group had a total between 3 and 4 depressive symptoms across the five study waves, while individuals in the resistant group had no symptoms of depression. In the increasing mild group, depression symptoms ranged from no symptoms at baseline up to 4 by Wave 5. For the resilient group, symptoms began at approximately 2 symptoms and decreased to none by Wave 5. Individuals in the delayed dysfunction group had less than 1 symptom for four study waves and by wave 5 had jumped to 3 symptoms. Individuals in the recovery group had little or no symptoms during the first two years of data collection, then slowly increased to between 1 and 2 during waves 3 and 4, and finally during wave 5 decreased to almost no symptoms. Collectively, approximately 1 in 6 NG soldiers fall into the chronic, delayed, or increasing dysfunction groups. The mean posterior probabilities of group membership assignment ranged from 0.731 to 0.917 for the six trajectory groups.

Table 2 reports the prevalence of the baseline risk factors. Approximately 40% of the sample were between the ages of 17-25, nearly half were unmarried, 22.5% had a high school education or less, 26.5% were deployed to an area of conflict, and 56.2% have had 6 or more traumatic life events. Approximately 7.0% of the sample were sexual minorities.

Table 3 presents the time-stable covariates (risk factors) and the coefficient estimates associated with a particular risk factors influence for a particular trajectory group membership. The risk factor associated with respondents being in the increasing (mild), resilient, recovery, and chronic dysfunction group was having 6 or more traumatic life events. Individuals with 6 or more traumatic life events were 3.40 times more likely in the increasing (mild) group (b = 1.225, p <.001), 3.22 times more likely to be in the resilient group (b = 1.169, p = 0.003), 14.49 times more likely to be in the recovery group (b = 2.673, p<.0001), and 5.86 times more likely in the chronic dysfunction group (b=1.769, p = 0.007). Sexual minority status was significantly associated with membership in the recovery and chronic dysfunction group. Sexual minorities were 3.30 times (b = 1.195, p = 0.007) more likely to be in the recovery group and 3.75 times (b = 1.322, p = 0.035) more likely to be in the chronic dysfunction group. None of the 6 risk factors were associated with delayed function group membership. The reference group for all the comparisons is the resistant group.

#### Discussion

The present study, to the best of our knowledge, is the first to investigate whether latent trajectory group membership of depressive symptoms in NG soldiers are associated with sexual minority status. Our study identified six trajectories of depressive symptoms among a representative sample of National Guard soldiers followed for 5 years using a semiparametric, group-based approach. Few studies have considered the natural course and heterogeneity of depressive symptomology in NG soldiers. In a study of NG soldiers, which excluded non-deployed soldiers, reported a 4 group trajectory model (Sampson et al., 2015); our study sample reported 2 additional groups. Our findings of a 6 group trajectory model are supported by a 12-year study in 1,260 community-based adults. Similar to our results, it included a recovery and increasing (mild) group (Andreescu, Chang, Mulsant, & Ganguli, 2008), however, only the increasing (mild) group was similar in proportion to our study results.

The finding that more than half of the NG soldiers belonged to the resistant group is consistent with research from a NG population (Sampson et al., 2015) as well as nonmilitary samples that the majority of individuals are resistant to trauma (Bonanno et al., 2012; Lowe et al., 2014; Nandi et al., 2009).

The prominent characteristic describing the chronic dysfunction group of having 6 or more traumatic life events and being a sexual minority is consistent with crosssectional studies of sexual minorities indicating that sexual minorities are at an increased risk for depression (S. D. Cochran et al., 2003; Gilman et al., 2001; Marshal et al., 2013; Marshal et al., 2011). Previous research has shown that sexual minorities have a higher prevalence of depression as compared to heterosexual individuals have been explained by the minority stress model in which individuals belonging to a stigmatized groups experiences increased stress from their stigmatization (Institute of Medicine, 2011; Meyer, 1995, 2003). For example, reserve soldiers are often deployed separately from

the unit that they train and maintain a civilian job while deployed (Griffith, 2011). In addition, with Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), there have been many more reservists being called to active duty, where nearly 500,000 of the 1.2 million US reservists have been mobilized and deployed (Bonds et al., 2010). What is more, the Don't Ask, Don't Tell policy was only recently repealed, which may have conferred its own unique stressors upon sexual minorities in the military (Burks, 2011). Our findings are consistent with the minority stress model, showing that being a sexual minority, having a higher level of traumatic life events, being a NG soldier, and the recent repeal of the Don't Ask Don't Tell policy, exacerbates being in the chronic dysfunction trajectory group for depressive symptoms.

The results of the current study must take into account several limitations. The number of sexual minority OHARNG soldiers in the current study was small and may limit the generalizability to other NG populations as well as limit the statistical power of the study. Also, it was assumed that sexual minority status was a static characteristic instead of a fluid model as studies have shown that the instability of sexual attraction, behavior, and identity over time (Diamond, 2005, 2006; Ott, Corliss, Wypij, Rosario, & Austin, 2011; Savin-Williams & Ream, 2007). Moreover, the use of telephone methodology instead of self-report of sexual orientation may have led to underreporting due to the stigma surrounding mental health (Greene-Shortridge et al., 2007; C. W. Hoge et al., 2004; Kim et al., 2010; R. H. Pietrzak et al., 2009) and sexual orientation in a military culture (Haggerty, 2003; Rostker et al., 1993)

Compared with other studies of depressive symptomology and the military, ours has several strengths. Compared to standard growth modelling which estimates a single

trajectory, the use of Proc Traj, which employs latent class growth modeling, permits the discovery of trajectories which may have been overlooked (Andruff et al., 2009). Proc Traj accommodates missing data and therefore participants with missing data will not be dropped from analyses like list wise deletion. In addition, the time between assessment periods do not need to be equal and assessment period do not need to be identical across participants (D. S. Nagin, 1999). We used a representative sample from the OHARNG rather than a convenience sample. Also, the creation of the sexual minority status was based on the assessment of sexual orientation which was composed of three dimensions instead of the use of a single question. Additionally, the study was longitudinal in nature instead of a cross-sectional study. The study contained 5 time points, instead of the minimum of 3 time points required for proper estimation, as 4 to 5 time points are preferable to allow for estimates of complex models following cubic and quadratic trends (Curran & Muthen, 1999).

The findings from this research begin to address gaps in both military and sexual minority research. The identification of six distinct trajectories of depressive symptoms and sexual minority status are predictors of group membership in a NG sample has important implications by providing new information regarding the heterogeneity of depression in a military sample longitudinally. Importantly, the findings of this study have significant implications on future military research, as sexual minority research under the repeal of Don't Ask Don't Tell is still in its infancy. Furthermore, results have significant clinical implications as health care providers should take into account sexual orientation and lifetime traumatic events in treating individuals with depressive

symptoms. Additional longitudinal research on military samples which include the

collection of sexual orientation data are needed to replicate and confirm study results.

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Number of Groups	BIC (N = 1473)	AIC	Difference in BIC	Difference in log Bayes Factor
1	-7146.08	-7135.49		
2	-5190.09	-5166.27	1955.99	3911.98
3	-4989.56	-4952.49	2156.52	401.06
4	-4859.66	-4859.66	2286.42	259.80
5	-4824.28	-4760.74	2321.8	70.76
6	-4783.73	-4706.95	2362.35	81.10
7*	-4759.15	-4669.14	2386.93	49.16
8**	-4762.52	-4659.26	2383.56	-6.74

\*Singular Convergence Problems

\*\*Decrease in fit based on log Bayes Factor





Pagaling Bick Easters	Overall (N = 1,473)	
Daseinie Risk Factors	n	Percent
Age (17-25)	560	38.02
Unmarried	693	47.05
High School/GED or Less	331	22.47
Area of Conflict	390	26.48
6+ Traumatic Life Events	828	56.21
Sexual Minority	103	6.99

Table 2 – Prevalence of Baseline Risk Factors

Group	Symptom Trajectory	Risk Factor	Estimate	Standard Error	p-value	Odds Ratio
1	Delayed Dysfunction	Age (17-25)	0.229	0.24	0.350	1.26
		Unmarried	-0.023	0.23	0.919	0.98
		High School/GED or Less	-0.156	0.23	0.501	0.86
		Area of Conflict	0.252	0.22	0.258	1.29
		6+ Traumatic Events	0.380	0.20	0.060	1.46
		Sexual Minority	0.194	0.38	0.609	1.21
2	Resistant	Age (17-25)	Reference			
		Unmarried				
		High School/GED or Less				
		Area of Conflict				
		6+ Traumatic Events				
		Sexual Minority				
3	Increasing (Mild)	Age (17-25)	0.558	0.37	0.135	1.75
		Unmarried	-0.357	0.36	0.327	0.70
		High School/GED or Less	0.028	0.33	0.933	1.03
		Area of Conflict	-0.537	0.35	0.130	0.58
		6+ Traumatic Events	1.225	0.32	<.001	3.40
		Sexual Minority	0.804	0.45	0.074	2.23
4	Resilient	Age (17-25)	0.295	0.41	0.469	1.34
		Unmarried	0.300	0.40	0.450	1.35
		High School/GED or Less	0.221	0.37	0.553	1.25
		Area of Conflict	0.227	0.35	0.520	1.25
		6+ Traumatic Events	1.169	0.39	0.003	3.22
		Sexual Minority	-0.419	0.83	0.614	0.66
5	Recovery	Age (17-25)	0.333	0.39	0.398	1.40
		Unmarried	-0.144	0.36	0.691	0.87
		High School/GED or Less	0.375	0.33	0.256	1.46
		Area of Conflict	0.535	0.31	0.081	1.71
		6+ Traumatic Events	2.673	0.63	<.0001	14.49
		Sexual Minority	1.195	0.45	0.007	3.30
6	Chronic Dysfunction	Age (17-25)	-0.979	1.02	0.339	0.38
		Unmarried	-0.626	0.55	0.254	0.53
		High School/GED or Less	0.862	0.45	0.058	2.37
		Area of Conflict	0.733	0.42	0.079	2.08
		6+ Traumatic Events	1.769	0.66	0.007	5.86
		Sexual Minority	1.322	0.63	0.035	3.75

Table 3 - Risk Factors Influence or	Group Membershi	o of Depression
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# CHAPTER 8: IMPLICATIONS, LIMITATIONS, STRENGTHS, FUTURE RESEARCH, AND CONCLUSIONS

## *Implications*

The findings from this research demonstrate the feasibility of collecting information on sexual identity, behavior, and attraction on a National Guard population. The lack of missing data collected on these three questions indicate that the NGB and other branches of the military should not be discouraged in collecting these additional pieces of information when gathering sociodemographic characteristics of their soldiers. The additional information on sexual orientation will be beneficial in the development of training programs to educate the military regarding sexual minorities as well as increased awareness to remove the stigma and discrimination that may be associated with sexual minorities. By changing the social acceptance of sexual minorities in the military, it may increase retention as well as enrollment into the military. Furthermore, it may increase unit cohesion and comradery within the units.

In addition, the findings from this research support the collection of multiple dimensions of sexual orientation in the thoughtful consideration on the operation definition of sexual minority status. Study results indicate varying results defined by each of the three dimensions of sexual orientation. With federal health surveys hoping to include measures of sexual orientation and future studies on sexual minorities, it reiterates the need for careful consideration regarding the operational definition of sexual minorities. By thoughtfully analyzing sexual orientation in public health data it may help better inform interventions and policies that are aimed at addressing sexual orientation and poorer health.

Surprisingly, the study results indicated that there was no association between sexual minority status and lifetime PTSD, however, associations were observed with past-year PTSD and individuals who self-identified as LGB or reported having same-sex behavior. This may indicate that the trauma associated with past-year PTSD may be attributed to stigma and discrimination based on one's sexual identity and behavior as regression models were adjusted for both sociodemographic and military characteristics, but were unable to measure stigma and discrimination in the study data. Another thought is that being open about ones sexual identity might result in unwanted bullying or attacks from others. In terms of same-sex behavior, there may possibly be unwanted attempts which resulted in a traumatic event leading to past-year PTSD.

Another surprising finding was that only same-sex behavior and same-sex attraction was associated with increased odds of lifetime and past-year depression. Individuals who self-identified as LGB were not associated with increased odds of lifetime or past-year depression. Given that sexual minorities in the Ohio Army National Guard are younger, this indicates the need for additional support groups and education for our younger troops by medical professionals or the military regarding sexuality, especially individuals who are still exploring and questioning their sexuality. With the repeal of Don't Ask Don't Tell, the military will start seeing an increased number of sexual minorities, therefore, such support is needed throughout the service member's military career and post-military life.

Although it may appear that sexual minority status is associated with poorer outcomes, it is likely a combination of social factors such as discrimination and stigma which have disproportionately affected sexual minorities. Although society as a whole

and the military are slowly changing their views on the acceptance and inclusion of sexual minorities, additional education and training is still needed to both remove the stigma and discrimination that once was associated with sexual minorities as well as training medical professionals and health care providers to be knowledgeable and sensitive regarding the unique health needs of sexual minorities. Policy makers must also be appropriately informed in order to make informed decisions regarding laws and policies which may affect sexual minorities. The adoption of non-discriminatory policies regarding sexual minorities are needed and such policies must be enforced to protect the rights and safety of sexual minorities.

#### Limitations

There are several limitations to the current studies. This was a secondary analysis of a longitudinal prospective study of mental health in OHARNG soldiers. The study was initially designed to study PTSD and other mental health conditions and was not designed to study sexual minorities. Furthermore, the OHARNG MHI started replenishment samples in Wave 3 to address loss to follow-up in the original cohort. As a result of the replenishing, there could be possible differences in the military and demographic characteristics. Therefore, the study wave at which the participants entered the OHARNG MHI was a control variable. The OHARNG MHI was conducted only in the state of Ohio and cannot be generalized to other ARNG's in other states. However, our sample was representative of the OHARNG.

Further limitations of the current studies include the assessment of the three dimensions of sexual orientation. The sexual orientation questions were only added

during Wave 5 of the OHARNG MHI and were assumed to be a static covariate. Scholars have described the development of non-heterosexual identity, behavior, and attraction as a fluid and complex process influenced by other psychosocial identities (Bilodeau & Renn, 2005; Diamond, 2005, 2006, 2008). Additionally, the assessment of the three constructs of sexual orientation were measured using different timeframes. Both the sexual identity and sexual attraction questions did not specify a timeframe whereas the sexual behavior questions were asked over the soldier's lifetime, in contrast to other studies that have used past-year or past-5-year measures (S. D. Cochran & Mays, 2000b; Gilman et al., 2001; Sandfort et al., 2001). Finally, the sexual behavior question did not assess the number of sexual partners, nor if it was consensual or forced.

#### Strengths

This study has several strengths which make a unique contribution to the limited research on sexual minority soldiers. Among these strengths was the use of a representative sample from the OHARNG rather than a convenience sample. Diagnosis of PTSD and depression were based on DSM-IV criteria and assessed using standardized instruments that have been validated in our study population. Longitudinal data was available for five study waves to evaluate depression. Furthermore, sexual orientation was assessed across three dimensions, utilizing questions suggested by the Williams Institute, a public policy research institute and lobby group based at the University of California Los Angeles focused on sexual orientation and gender identity issues, which allowed for better categorization of individuals as being part of a sexual minority group.

## Future Research

Ideas for future research in the area of mental health in military sexual minorities are countless. In general, additional population studies are needed to characterize differences between sexual minorities compared to their heterosexual peers, as most research has been conducted on convenience samples and limits the generalizability of study results. The continued collection of all three dimensions of sexual orientation in population studies will add to the dearth of current research data on sexual minorities. Therefore, the associations observed in the two cross-sectional studies and one longitudinal study warrant additional research to confirm study results. As additional studies on sexual minorities in the military begin to emerge, new correlates are being recognized. The fluidity of the dimensions of sexual orientation is gaining much attention because research has shown that some individuals change their choice of identity, sexual attraction, or sexual behaviors across the lifespan. Depending on the stage of life of the transition, different stressors may result and understanding these transitions will help better target interventions to improve mental health. In addition, the application of the sexual minority stress theory in military sexual minorities requires additional examination.

Another avenue to explore will be health care utilization among military sexual minorities. With the repeal of DADT, health care providers will be seeing an increase number of sexual minority individuals in their offices. Current research is unclear if the repeal of DADT has removed any barriers that might prevent sexual minorities from seeking health care from the VA or other health care providers as research has shown that LGB patients are reluctant to seek health care unless the provider offers services specific

to sexual minorities. Consequently, there is a need to train health care professionals to be knowledgeable and sensitive to the specific health needs of sexual minorities.

## **Conclusions**

Sexual identity, sexual behavior, and sexual attraction which compose sexual orientation is a complex construct and results cautions against the use of a single question to assess sexual orientation. However, based on study results gathered, it shows the feasibility of asking such sensitive questions among a military population. The study found a higher percentage of lesbian and bisexual females are serving in the OHARNG than gay or bisexual men. The majority of sexual minorities in the OHARNG did not meet criteria for a mental health diagnosis. Despite these findings, there was a higher prevalence of PTSD and depression in sexual minorities as compared to their heterosexual counterparts. Furthermore, sexual minority status and reporting lifetime sexual violence was associated with an increased risk of lifetime and past-year PTSD and depression. The longitudinal examination of depression across the five study waves indicate that there are distinct trajectories groups of depression within the OHARNG. Sexual minority status was a risk factor for being in the chronic dysfunction and recovery groups. These findings further reinforce the need for mental health research of sexual minorities in the military and a better understanding of the subpopulation within sexual minorities who have an increased risk for mental illness. This study can inform researchers, health care providers, and the military regarding the need to capture sexual orientation data in the treatment of mental health disorders.

## **CHAPTER 9: SUPPLEMENTAL ANALYSES WITH AMOS AND MPLUS**

The OHARNG MHI is a longitudinal study which has captured five study waves of data across 6 years. This provides a unique opportunity to examine developmental trajectories of OHARNG soldiers across the study years through the use of various longitudinal techniques and software packages. There are benefits and limitations to the software packages that are employed in latent growth curve modeling.

Initially, depression symptoms were examined with a conventional growth curve in AMOS, a module within SPSS used for structural equation modeling, path analysis, and confirmatory factor analysis (Arbuckle, 2013). Conventional growth curves are used to describe how patterns of growth vary continuously across a population and not designed to identify distinct clusters of trajectories (D. S. Nagin, 1999). It gives a single average growth estimate and assumes covariates uniformly influence variance and growth parameters (Jung & Wickrama, 2008). The application of this technique to model depression longitudinally in our study population was not the preferred technique as it did not answer our research question appropriately. This approach is appropriate when all individuals of a given sample are expected to change in the same direction, such as the introduction of an intervention.

Since our research question involved depression symptoms and classifying individuals into distinct trajectory groups based on their individual response patterns, it would be incorrect to assume that all individuals would be experiencing an increase or decrease in symptoms. A single averaged growth trajectory would mask individual differences which would lead to inaccurate conclusions (Andruff et al., 2009). Therefore, we used Proc Traj in SAS, a semi-parametric, group-based modeling approach used to

identify distinct clusters of developmental trajectories within a population (D. S. Nagin, 1999). Benefits of Proc Traj is that it accommodates missing data, therefore, individuals with missing data will not be dropped from the analysis. Furthermore, the time between measurements do not need to be equally spaced and assessment periods do not need to be equal across participants. However, a disadvantage of using Proc Traj are the number of available information criteria used in determining the optimal number of groups (D. S. Nagin, 1999); it is limited to the BIC, log Bayes Factor and posterior probabilities.

Mplus, similar to Proc Traj, was designed to examine distinct trajectory groups (Jung & Wickrama, 2008). Results produced by Mplus and Proc Traj, theoretically, should be the same with the exception of additional information criteria which include the Lo-Mendel-Rubin likelihood ratio test (LMR LRT), Lo-Mendel-Rubin Adjusted likelihood ratio test (LMR ALRT) and the bootstrapped parametric likelihood test (BLRT) (Muthén, 2004). A disadvantage of Mplus is the amount of computing time necessary to compute the BLRT (Nylund et al., 2007).

Whether Mplus or SAS's Proc Traj is used, a point of contention surrounds which model fit index to use in determining the appropriate number of trajectory groups. Currently, the smallest BIC value and significant LMR-LRT is used to find the best fitting model (Jung & Wickrama, 2008). Simulations have shown that the BIC performed the best among the information criteria indexes, however, the BLRT proved to be an even better indicator of determine the number of trajectory groups (Nylund et al., 2007).

Given the additional information criteria indexes provided in Mplus, the trajectory results from Proc Traj were compared to Mplus results. Surprisingly, the results from the

two software packages were not the same; there were fewer trajectory groups suggested by Mplus. In trying to understand why two software packages developed to model the same technique would result in differing results, it is important to remember that determining the number of classes depends on a combination of factors. The number of trajectory groups should be determined by one's own research question, theoretical justification, and interpretability in addition to the fit indices (Bauer & Curran, 2003; Muthén, 2003; Rindskopf, 2003). Therefore, the fit indices and tests of model fit should not be the final determination of the number of trajectory groups, but a useful method in exploratory stages. Furthermore, there is no consensus as to the best fit index (Jung & Wickrama, 2008).

Based on study results and recommendations from existing research on the number of trajectory groups for depression, additional research and examination with SAS and Mplus are needed to confirm present and past study results.

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10 USC § 654.

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