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The Social Construction of Performance Enhancing Steroid Policies and Their Impact on U.S. Army Service Members

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Abstract

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by

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MA, American Military University, 2013

BS, Weber State University, 2007

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The United States military has seen a continued rise in the use of illicit performance enhancing substances, particularly androgenic-anabolic steroids (AAS), by service members in highly demanding occupational specialties. Despite these rising trends, there remained a lack of understanding of how U.S. Army substance abuse policy impacted service members' motivations to use banned performance enhancing drugs. The purpose of this qualitative study was to better understand the motivations of service members who use performance enhancing AAS, as well as the impact of substance abuse policies on those individuals. This study's questions explored how social constructs and Army policy impacted service members who use performance enhancing drugs to examine how AAS use influenced service members' health and mission readiness. The framework for this study was based on the social construction of meaning, as seen by service members, through a narrative analysis of their individual experiences. The policy and social impacts on AAS user motivations found in this study highlight how social constructs experienced by service members can influence behavior related to AAS use. While some respondents indicated that Army policy had a deterring effect on AAS use, the inconsistent enforcement of policy significantly reduced policy impacts experienced by these service members. These factors impacted user motivations to a greater degree because of the limited policy and health risks experienced by AAS users. Addressing these policy challenges has implications for developing harm-reduction interventions, which can improve the well-being of vulnerable service members leading to positive social change.

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Chapter 1: Introduction to the Study

Introduction and Background

Military service members have a unique role in society that often places them in high-intensity training, crisis response, and combat environments, each of which requires significant physical performance levels. Improving the physical performance abilities of service members has always been a clear goal of militaries throughout history. However, medical developments over the past century have resulted in physical enhancement capabilities that may exceed natural human development, while simultaneously raising important public health and ethical questions. In particular, the development of anabolic-androgenic steroids (AAS) and their growing prevalence globally presents a significant health issue in the United States and among military service members due to the serious mental and physical health effects these substances may cause. Despite decades of research on AAS use, there remains limited study and literature on the potential impacts these substances may have on U.S. Army service members, or how related AAS policies are impacting the behaviors of those at the highest risk of AAS use.

U.S. Army and Department of Defense (DoD) policy has banned the use of AAS for decades and continues to prohibit the use of steroids and other controlled substances without a legal prescription for these substances as outlined in Army Regulation 600-85: The Army Substance Abuse Program (Department of the Army [DA], 2020b). This includes the misuse of prescribed drugs, or the use of drugs that are pharmaceutically analogous to controlled substances such as AAS. Service members who violate regulations and policy regarding AAS use are subject to mandatory substance abuse

treatment and disciplinary and legal actions, including incarceration and/or separation from service. While random drug testing is the primary deterrence mechanism used by this service, AAS testing requires special procedures and tests that are not part of standard randomized drug tests (DA, 2020b). Despite the strict prohibition against AAS use, this service continues to face AAS use problems that appear to be growing.

While greater emphasis has been placed on AAS use in the U.S. military in the 1990s and early 2000s, current literature related to this population group has failed to keep pace with AAS research among other populations or countries. Significant attention on AAS use in the U.S. military between 2008 and 2016 was driven by rising prevalence rates reported through the early 2000s (Givens et al., 2016), along with highlighted DoD-wide issues on this topic. The rise in AAS use in the U.S. military resulted in a symposium of military leaders and medical providers examining this issue in 2016, with Givens et al. presenting the findings on this topic; however, the findings and recommendations published from that work have largely remained unaddressed. AAS research on U.S. military populations has received little attention in current literature since that time.

Many of the gaps identified in current literature regarding AAS prevalence rates, user motivations, and policy impacts among non-military AAS communities are present in military-focused literature. The gaps in literature on AAS use are even greater in military-focused studies, as they have primarily been directed at limited case studies related to acute negative health impacts linked to AAS use (Whyte et al., 2021b). Whereas the literature on non-military populations has made progress in addressing many

of these same gaps, the greater lack of understanding of AAS use among service members places this group at even higher risk.

The majority of AAS literature is focused on more general athletic and fitness-oriented population groups, due to AAS use primarily originating among elite competitive athletes in the 1960s, 1970s, and 1980s. The focus on AAS use among more generalized populations has expanded to address user motivations in recent decades, with a growing body of work addressing potential policy or intervention programs that could be aimed at all types of AAS users (van de Ven et al., 2020b).

The basic motivations to use AAS are tied to a desire to enhance physical performance, but a deeper understanding of the motivations and social factors related to AAS use is needed to address this public health issue (Christiansen, 2020). Efforts to gain this understanding of AAS user motivations in the military show many of the same characteristics found among non-military users as demonstrated by the work of Whyte et al. (2021a), which examined military veteran AAS users in the United Kingdom (UK). However, there were unique military-related motivations and constructs that should be researched further to determine motivational factors among U.S. service members and veterans. Additionally, research on the impact of the U.S. military's substance abuse policy on these populations are almost absent from current and past literature. This study was conducted to improve understanding of the unique motivational and policy impacts that contribute to the use of AAS by U.S. Army service members.

To address the gaps in the literature on AAS use among U.S. Army service members, I will introduce the problem, purpose, and specific research questions of this

study in this chapter. From there, I will describe the theoretical framework and methodology that were used to answer these questions and contribute to the body of literature on this topic. This chapter will also include key definitions, assumptions, the scope of study, and limitations of this work. I will conclude this chapter by highlighting the significance of this study in understanding the motives and social constructs that may increase the risks of AAS use among service members, as well as impacting their health and unit mission readiness.

Problem Statement

The problem is that there is a lack of understanding of how the service's substance abuse policy impacts the service members' motivation to use banned performance-enhancing AAS. The U.S. military has observed a continued increase in the use of AAS and other related substances over the last two decades, despite substance abuse policies that prohibit the use of these substances (Peltier & Pettijohn, 2018). The rise in AAS prevalence creates public health issues and can also negatively impact mission readiness in military units, as service members are temporarily or permanently removed from service to receive required health care or experience negative reactions during military activities (Kegel et al., 2020; Larsen et al., 2019; Ordway et al., 2021; Whyte et al., 2021a;). Whyte, et al. (2021b) also suggested that this problem persists because AAS use is seen as increasingly acceptable to military personnel based on their perceived performance benefits, and military drug-testing efforts that may deter their use have had limited effectiveness.

This problem impacts U.S. Army service members because service policies may also have challenges with reducing growing AAS prevalence rates, limited reduction of mental or physical risks and associated treatments, or a lack of understanding of motivating factors that promote use among service members. There are many crucial factors contributing to this problem, such as difficulty in determining the actual extent of AAS use in the U.S. military, the lack of trust service members have in medical providers, a lack of understanding of AAS effects, and existing institutional motivations that may promote AAS use in the military (Peltier & Pettijohn, 2018). This study contributes to the body of knowledge and literature needed to address this problem by addressing the gaps in understanding related to the motivations of service members who use performance enhancing AAS and the impacts of the Army's substance abuse policy.

Purpose of the Study

The purpose of this qualitative study was to improve the understanding of the motivations of U.S. Army service members who use performance enhancing AAS and the impacts of the Army's substance abuse policy on those individuals. The central phenomenon was the public health concerns associated with AAS use among service members and veterans, and the limited understanding of how the service's substance abuse policy impacts the negative health risks or positive physical enhancements associated with AAS use. The questions asked in this study are about understanding the social constructs that have shaped the Army's substance abuse policy and how those constructs have impacted individual service members' motivations to use AAS despite significant legal and health risks.

Research Questions

The lack of understanding of motivational and social factors impacting the use of AAS by service members limits deep assessments of the full nature of AAS problems within the U.S. Army. To provide a deeper understanding of AAS use in the service and reduce the gaps found in the current topical literature, this study addressed questions about how policy and social norms and constructs impact AAS user motivations. The two questions below are focused on addressing gaps in understanding user motivations as they relate to policy and the social impacts on those motivations. Answering the questions in this study contributed to the body of literature on AAS users by exploring the unique societal constructs that influence the individual behaviors and experiences of service members.

RQ1: How do U.S. Army substance abuse policies impact the motivations and experiences of service members who use AAS?

RQ2: How do social views on "fair play," mission readiness, and physical performance in the U.S. Army impact service members' motivations to use AAS?

Theoretical Foundation

Social construction theory is an excellent theoretical foundation for examining the motivations of individuals as well as the institutional impacts that further influence motives and behaviors of individuals. Social construction theory has been used extensively in many fields of study since Berger and Luckmann first published this theory in 1966 (Berger & Luckmann, 1990). Ingram et al. (2007) built upon the theory by developing a framework to examine the construction of social policies based on the

power and resources available to various groups. Their work to apply social construction theory to public policy development is useful in examining how policies can either help or degrade policy impacts on individuals. Furthermore, Schneider and Ingram (2008) pointed out how social constructs have the potential to perpetuate flawed policies that do not achieve their goals or can even run counter to the policy's stated purpose. Chapter 2 presents a deeper explanation of how power and resources influence social constructs, as well as how the elements of policy design can impact policy outcomes and population behavior. Using their framework to examine the power imbalances found within the military and the social constructs that drive substance abuse policy will support a deeper examination of service member motivations and military policy impacts. Social construction theory in public policy will also provide a foundation for examining internal and external social factors that have contributed to AAS use, policy, and treatment.

In addition to social construction theory, this study also incorporated an AAS user typology to frame individual factors exhibited by AAS users in the U.S. military. Christiansen et al. (2017) applied Weber's (1970) ideal-type methodology to develop a typology with four AAS user ideal types which are categorized by examining risk tolerance, performance goals, and knowledge levels of AAS users. This typology was useful in examining individual service member motivations as well as connecting user motivations with social constructs and Army policy impacts that may influence individual experiences and behaviors.

Nature of the Study

To gain a deeper understanding of AAS use in the Army and reduce the gaps found in the current literature, this study used qualitative narrative analysis to answer questions about how policy and social norms impact AAS user motivations. Esin et al. (2014) suggested that examining individual narratives in the context of institutional and social influences on induvial experiences will promote a greater depth of knowledge on that topic of interest. When considering AAS use among service members, researchers must look beyond the base motivations driving AAS use to understand behaviors that could significantly harm individual health, career security, or mission readiness. Additionally, punitive anti-doping policies often do not address the positive motivating factors that may align with Army fitness demands or incorporate effective harm-reduction strategies or treatments.

A qualitative study was well suited to answering the questions asked in this study as these research questions consider the relationship between social factors and individual experiences (Creswell, 2009; Kim, 2016). Understanding how individual AAS users make meaning of the institutional norms and policies of the Army contributed to understanding the effectiveness of those policies in influencing the behavior of AAS-using service members. Ingram et al. (2007) suggested that this connection between policy development and related social constructs is critical to examining the behaviors influenced by those policies. Narrative survey data from AAS users in the Army, and leaders responsible for substance abuse policy implementation, allowed me to answer this study's research questions.

Definitions

Certain terms associated with military service and AAS substance use are addressed within this study require clarity regarding their usage. This section provides definitions for these terms as they are applied to this study.

Active duty: An individual on full-time duty in the active military service of the United States. This term includes full-time training duty, annual training duty, and attendance, while in the active military service, at a school designated as a service school by law, or by the Secretary of the military department concerned. The term does not include full-time National Guard duty. (Armed Force, 10 U.S. Code § 101, 2022)

Anabolic-androgenic steroids (AAS): synthetic, or human-made, variations of the male sex hormone testosterone. The proper term for these compounds is anabolic-androgenic steroids. "Anabolic" refers to muscle building, and "androgenic" refers to increased male sex characteristics (National Institute on Drug Abuse [NIDA], 2018a)

Cycling: Taking multiple doses of steroids over time, stopping for a time, and then restarting (NIDA, 2018a).

Doping: The occurrence of one or more of the anti-doping rule violations outlined in the World Anti-Doping Code, such as the use, possession, trafficking, or administration of a banned substance such as AAS (World Anti-Doping Agency [WADA], 2021).

Drug abuse: The use or possession of controlled substances, or illegal drugs, or the nonmedical or improper use of other drugs that are packaged with a recommended safe dosage, such as prescription and over-the-counter drugs. This includes the use of

substances for anything other than their intended use, such as glue and gasoline fume sniffing or steroid use for other than that which is specifically prescribed by a competent medical authority (DA, 2020b).

Drug addiction: Primarily defined as compulsive substance use that occurs despite personal harm or negative consequences (Smith et al., 2013).

Drug dependence: A physical or psychological response associated with withdrawal symptoms, or syndromes resulting from a rapid reduction in substance exposure (Smith et al., 2013).

Drug misuse: Use of a substance that does not follow medical indications or prescribed dosing (Smith et al., 2013).

Mission readiness: The ability to provide capabilities required by the Army to execute an assigned mission. This is derived from the ability of each unit to deliver the outputs for which it was designed, which, in turn, requires individuals to perform their assigned duties (DA, 2020a).

Plateauing: Alternating, overlapping, or substituting with another steroid to avoid developing a tolerance (NIDA, 2018a).

Probable cause: A reasonable grounding in fact and circumstance for a belief in the existence of certain circumstances, such as that an offense has been or is being committed, that a person is guilty of an offense, that a particular search will uncover contraband, that an item to be seized is in a particular place, or that a specific fact or cause of action exists (DA, 2020b).

Pyramiding: Slowly increasing the dose or frequency of steroid misuse, reaching a peak amount, and then gradually tapering off to zero (NIDA, 2018a).

Service member: A member of the "uniformed services," consisting of the armed forces (Army, Navy, Air Force, Marine Corps, Space Force and Coast Guard), the Commissioned Corps of the National Oceanic and Atmospheric Administration (NOAA) and the Commissioned Corps of the Public Health Services (War and National Defense, 50 U.S. Code § 3911, 2022).

Stacking: Combining two or more different steroids and mixing oral and/or injectable types (NIDA, 2018a).

Substance use disorder: Occurs when a person's use of alcohol or another substance (drug) leads to health issues or problems at work, school, or home (DA, 2020b).

Veteran: A person who served in the active military, naval, or air service, and who was discharged or released under conditions other than dishonorable. This also includes reservists or national guard members who have been called to active federal service (Department of Veteran Affairs [VA], 2019).

Assumptions

The primary assumption made in this study was that AAS prevalence rates among U.S. Army service members have remained consistent with or have even increased based on global and U.S. prevalence trends. While the recent health survey by Meadows et al. (2021) conducted among U.S. service members reported only a 0.2% AAS use response rate, it was assumed that the much higher prevalence rates of 5.6-32.0% found among

some service member populations did not significantly drop in the last few years (Givens et al., 2016). Determining prevalence rates within the Army was well beyond the scope of this study, but the assumption that AAS prevalence remains in line with global and national usage rates was foundational for examining user motivations and policy impacts related to AAS use among service members.

The second assumption was that performance enhancing substances will continue to proliferate among the public and particularly among service members. The growth of biomedical, pharmaceutical, and technological human enhancement treatments, along with their growing social acceptance, will continue to impact how service members view AAS use and its potential positive benefits. Without examining the impacts that social constructs and Army policy have on current AAS users, there will continue to be a gap in knowledge regarding effective policy responses to health concerns raised by performance enhancing substance use in the military.

A third assumption made was that participants with a history of AAS use will mirror predominant male demographics found in most current research literature. Whereas there is a significant gap in knowledge on the different impacts of AAS use between male and female users, it was assumed that there will be a lack of female, AAS-using participants. This assumption was based on the limited percentage of females serving in the occupational specialties targeted in this study and was consistent with the respondents who participated in this study.

Finally, due to the stigmatized and illicit nature of AAS use, the presumption of full honesty from participants was not assumed. While the voluntary nature of the

participants suggests that their narratives were trustworthy, it cannot be assumed that their responses will fully address this topic. Because this assumption could not be accepted, this study does not provide generalized findings that can be applied to broader U.S. military or Army populations. This study does provide an initial examination of the policy impacts on AAS user motivations which can be further explored as part of an improved body of work on AAS use in the U.S. military.

Scope and Delimitations

The scope of this study examined the impacts of the U.S. Army's substance abuse policy and service-related social constructs on the motivations of AAS using service members. This study was not focused on determining the extent of positive or negative health impacts, ideal modes of AAS use, prevalence rates among the military, or any sub-population within the Army. The public health issues that drive this social problem and medical mistrust by AAS users are central factors with existing literature gaps; however, the research problem of this study was focused on improving understanding of the motivations of service members who use performance enhancing AAS and the impacts of the Army's substance abuse policy on those individuals. The focus on the social constructs surrounding these policies and individual use motivations was aimed at developing a greater understanding of user experiences and supporting effective intervention and policy strategies in the future.

This study was bounded by selecting participants from occupational specialties within the Army that rely on high levels of physical performance and mission readiness. These specialties primarily focused on infantry and special operations participants. There

were limited delimitations regarding the selection of some participants from outside of the ideal specialties based on participant recruitment. These participants also require high fitness levels and were from artillery, military police, and armor occupational specialties. While participants outside of these specialties were projected to be excluded, further delimitations were made to include additional responses that provided insights into unique military social constructs. This study also focused primarily on active-duty service members with additional delimitations for service members no longer on active duty, but with recent experience with the Army's AAS policies.

The selection of these types of participants from within the Army was to address the unique military social factors influencing motives that are not as likely to be found among the more general AAS users examined in the existing literature. For example, an AAS user in a physically demanding occupation with high rates of exposure to combat conditions is likely to present motivations that are different from an amateur civilian bodybuilder. Conversely, service members who do not have a significant occupational requirement for physical fitness, or with reduced combat exposure, are likely to share similar motivations as general civilian AAS users. As stated above, additional participants were included based on their informative narratives. Additionally, participants who had experience administering substance abuse programs were included to provide further insight into social constructs and Army policy.

The scope of this study was not tied to any demographical factor outside of the participants' occupational specialty or service status. The majority of AAS literature is focused on male populations, and that trend was continued in this study. This study was

unable to focus on any gender differences related to AAS use, as only male respondents participated in this study. Otherwise, participants were drawn from physically-orientated and combat-related occupational specialties from multiple regions to ensure a broader range of participants from across the Army. This ensured a variety of responses and prevented this study from being focused solely on a limited number of organizations or units within the Army.

This study examined the social constructs related to the Army's substance policy and culture to improve understanding of the motivations of service members who use performance enhancing AAS. Literature on AAS and AAS policy issues have primarily focused on the examination of athletic anti-doping policies, and there is limited literature on AAS policy related to military use. There was potential for including an examination of the U.S. Department of the Army's (2020b) inclusion of World Anti-Doping Agency material within their substance abuse policy. Mallinson's (2021) recent analysis of policy diffusion theory suggested how diffusion theory could be used to examine policy development between government agencies; however, when considering the potential policy influence of anti-doping agency policy on the Army's substance abuse policy, the inclusion of this theory would have shifted the focus away from the principal issue of how their policy impacts AAS user motivations.

This study addresses the policy impacts and unique occupational aspects of the Army and could contribute to the body of literature on AAS use among various populations outside of sports-focused AAS research. While this study targeted the U.S. Army, it could also contribute to additional research on DoD-wide or other services'

populations with a history of AAS use. Additionally, military service members do experience many occupational differences than those typically found in civilian occupations; however, some occupations may be impacted by similar AAS use issues. The transferability of this study could aid further examination of the motivations and substance abuse policies related to other armed services, law enforcement, fire rescues, or other public services that have unique occupational considerations and physical demands that may also promote AAS use among their ranks. Based on growing AAS prevalence rates among an increasingly diverse demographic, the need to gain a deeper understanding of this issue is important to developing the most effective intervention strategies and policies across a variety of user groups and occupations.

Limitations

The primary limitation to this study was the lack of generalization toward understanding a broader military or Army population. This limitation was primarily due to the smaller sample size used to focus on the narrative experiences of the participants. While this approach provided deeper individual insights, the sample size did not account for each of the different AAS user types that potentially exist within the Army. The exploratory nature of this narrative approach can lay the groundwork for further study, but it does not fully address the overall challenges with policy enforcement and testing that were raised in this study. Additionally, the narrative focus did not account for how the Army's substance abuse policy has more universally impacted service member motivations across the force. Furthermore, as this study focused on individuals who have elected to use AAS despite Army policy, this study could not determine the amount of

service members who have been deterred from using AAS due to current policy, nor do the findings associated with the non-using participants provide generalized views of service members. Additional research is needed to determine the impact current policy does have on deterring service members who may otherwise be inclined to use AAS.

An additional limitation is also present due to the use of survey instruments for data collection. The inability to ask follow-up questions or seek clarification on survey entries limited my ability to fully develop how participants have constructed their experiences with the Army's substance policy and social factors impacting their AAS use motivations. Atkinson et al. (2021) highlighted the limitations of surveys to address complex AAS factors but still found them useful in developing understanding of this topic. This limitation was necessary to protect participants' privacy and minimize potential risks associated with my obligation to report misconduct as a currently serving officer in the military. While the limitations of a survey collection instrument were present, I was able to explore important perspectives that have been poorly examined in current literature.

Anticipated limitations related to biases associated with participant variety, service member and veteran differences, and leadership were not apparent as responses were collected from across these demographics. The responses from across the sample pool presented consistent data without any notable differences based on service history or occupational specialty. Additionally, because there are various leadership styles and legal advisors in the military, a small sample of non-AAS using policy administrators could have induced bias toward either excessive punishment or leniency when applying these

policies. However, recruiting efforts produced participants from a variety of ranks, units, occupational specialties, and regions, which helped reduce bias that may have been present if findings were based on localized populations rather than broader individual experiences.

Significance of the Study

The lack of attention on addressing the growing substance abuse problem in the U.S. military does little to mitigate the physical and mental health concerns that are impacting vulnerable service members. The potential long-term impacts of AAS use on service members may also contribute to multiple other veteran issues related to drug abuse, homelessness, and suicide. While not significantly emphasized in this study, some participants noted risks associated with long-term mental health and substance dependency that could impact these other Army-related social issues. This problem impacts service members who are using banned substances to improve mission performance, and who may also not be receiving adequate levels of medical care or access to treatment programs.

The lack of recent literature on AAS use rates, long-term health impacts, medical mistrust, motivational issues, and policy impacts are ongoing issues for all AAS using populations with even more significant gaps found in U.S. military populations. This study was not aimed at determining accurate AAS health impacts, medical mistrust issues, or prevalence rates, but it does contribute to reducing the gaps in knowledge on motivations that are promoting AAS use, as well as how Army policy impacts those same motivations. This study can provide a foundation for a more comprehensive examination

of U.S. military policies in the future by incorporating AAS user feedback into comprehensive policy reviews and the development of intervention strategies aimed at reducing health and mission risks.

This study helps bring AAS research on U.S. military populations more in line with research efforts among other populations, as well as laying the groundwork for examining emerging harm-reduction strategies in the U.S. military. This study also contributes to understanding the anti-doping policies currently being used in the DoD. Current literature on strict anti-doping policies, like the policies used by the Army, highlights several challenges that can limit the effectiveness of these types of policies (Collins, 2019; Goldman et al., 2019; Henning et al., 2021). The deeper understanding of the individual user motivations and policy impacts experienced by service members developed in this study can contribute to the development of harm reduction strategies focused on treatment and support. Incorporating user feedback into the body of knowledge on AAS use is critical to examining treatment and policy goals in a manner that will better protect health and reduce mission readiness risks.

This study also has potential implications for effecting positive social change regarding the negative social stigma associated with AAS use. Negative stigma has directly been attributed to AAS users receiving ineffective medical care that puts these users at greater risk (Ainsworth et al., 2022; Hope et al., 2020). Creating greater understanding of AAS users and reducing negative stigma can promote positive social change by reducing barriers that AAS users have to receiving medical treatment and harm-reduction interventions. Service members are typically not seen as a vulnerable

population but due to the power imbalance and stigma experienced by AAS users, this study highlights how stigma and policy may be contributing to the suppression of AAS users receiving effective health care and treatment.

Summary

The absence of recent studies regarding AAS users in the U.S. military highlights the research problem by demonstrating a lack of focus on this growing issue within the DoD and the Army. The lack of knowledge on AAS user motivations and policy impacts is significant due to the rising global prevalence rates and the resulting public health and mission readiness issues. While answering questions about prevalence rates, medical mistrust, and long-term health impacts associated with AAS use is important, this study was aligned to address gaps related to a lack of understanding on user motivations and policy impacts on user behavior. The limitations of this study do prevent the resultant findings from providing broad generalized information on AAS using service members, but it does provide the essential understanding needed to conduct further analysis of this unique population.

Conducting qualitative research on active-duty U.S. Army service members allowed me to answer the research questions about unique service member motivations, as well as the associated social constructs resulting from Army policy. The primary results of this study contribute to understanding the impacts that Army policy has on the motivations of service members regarding their AAS use as part of their military service. Answering these questions can also contribute to future efforts to address policy barriers and promote interventions that best serve AAS user needs and mission requirements.

Overall, understanding the motivations and policy impacts on service members can be used to incorporate these experiences into future efforts to protect the mental and physical health of this population, reduce unmonitored or illicit abuse, promote mission readiness, and identify improvements in substance abuse treatment and interventions.

To better understand the policy and social impacts on AAS user motivations among service members, this study was organized to examine the current work done on this topic, establish my research method, examine research results, and conclude with a discussion of my findings. In Chapter 2, I will discuss my review of current literature and describe my literature search strategy, related theoretical framework, and key concepts associated with AAS use. Chapter 3 will include my research method, research design, role as a researcher, methodology, and issues of trustworthiness. In Chapter 4, I will describe how data were collected and analyzed, as well as review significant results associated with policy and social impacts on the participants of this study. Chapter 5 will provide a discussion of those results, my recommendations for future study, and the social impacts of my findings. In this manner, I will demonstrate current gaps in understanding on AAS use among service members, as well as establish how this study addressed those gaps in a way that contributes to the current body of work on this topic.

Chapter 2: Literature Review

Introduction

The rise in AAS use in the United States poses a public health risk, yet there is limited understanding of how these trends occur among military service members, or how the Army's substance abuse policy impact service members who use AAS during their military service. Although significant efforts have been made to understand the prevalence of AAS use, contributing motivations, and health impacts on the military, research on AAS use in the U.S. military has been limited (Austin et al., 2016; Bucher, 2012; Friedl, 2015; Givens et al., 2016; Paisley, 2015). More recent research efforts among military populations focused primarily on case studies related to health risks and impacts but still highlighted gaps in research on the contributing motivations of individual users or the lack of examination of deterrence, intervention, or treatment policies (Ordway et al., 2021; Peltier & Pettijohn, 2018; Scharre & Fish, 2018). Current literature continues to stress a lack of understanding on both the immediate impacts of AAS use and the poorly understood long-term impacts that further put service member populations at risk.

AAS use trends identified by earlier studies on military populations suggested increasing levels of use within the U.S. military. More recent research focused on sports communities and some foreign militaries highlighted a continued rise in AAS use that is assumed to also be present among the DoD services. Research related to the growing popularity of AAS use among elite and amateur sport communities, bodybuilders, and young adult males further highlighted a growing acceptance of AAS use to achieve

performance enhancing goals (Althobiti et al., 2018; Goldman et al., 2019; Sagoe & Pallesen, 2018). Christiansen (2020) suggested that most research has focused on AAS use by adolescents and bodybuilders, despite most users likely falling outside of these two groups. However, many of the motivations and risk factors demonstrated among non-military populations are like motivational factors within the military, as demonstrated by a recent study focused on military veterans in the UK (Whyte et al., 2021a). The continued gaps in research related to understanding motivations and policy impacts among a broader global community only further highlight gaps in knowledge and a lack of related research on service members and veterans.

The purpose of this qualitative study was to improve understanding of the motivations of service members who use performance enhancing AAS, along with the impacts of military substance abuse policies on those individuals. The central phenomenon is the public health concerns associated with AAS use among service members and veterans, and limited understanding of how the Army's substance abuse policy impacts the negative health risks or positive physical enhancements associated with AAS use. Additionally, AAS use can also negatively impact mission readiness in military units as service members are permanently or temporarily removed from service to receive required health care or experience negative reactions during military activities (Kegel et al., 2020; Larsen et al., 2019; Ordway et al., 2021; Whyte et al., 2021a;). The questions asked in this study are about understanding the social constructs that have shaped the Army's substance abuse policy, and how those constructs have impacted service member motivations to use AAS despite significant legal and health risks.

Due to the lack of focus on AAS use among U.S. military populations, an examination of current literature focused on a variety of populations to understand key concepts associated with this phenomenon. Three major research themes emerged when examining the larger body of work focused on AAS use. First, studies related to patterns of use primarily focused on understanding the prevalence of use, how individuals were introduced to illicit substances, and what motivations and justification for use were presented by individual users (Hearne et al, 2021, Nagata et al, 2022; Underwood et al, 2021). Second, the literature has examined the physical and mental health impacts associated with AAS use and highlighted significant trust barriers between users and medical providers (Anawalt, 2019; Bonnecaze et al., 2020; Hauger et al, 2021; Ordway et al, 2021). Third, emerging literature has examined anti-doping policies or potential improvements in AAS use interventions and policies (Salinas et al, 2019; van de Ven et al., 2021). This last theme also includes literature, which has considered potential policy frameworks for safely and ethically authorizing the use of AAS and other pharmaceutical performance enhancements in the military (Caron, 2020; Goodley, 2020; Latheef & Henschke, 2020; Mulrooney et al., 2019; Peltier & Pettijohn, 2018). Each of these themes address important aspects and social constructs related to this problem and highlight continuing gaps in understanding the motivations and policy impacts among many AAS using populations.

The gaps in knowledge on motivations and policy impacts are even more apparent when considering the lack of focus and literature on at-risk populations within the U.S. military. To highlight these gaps, this chapter will include the strategy I used to search for

relevant literature, discuss why a social construction framework is useful in addressing these gaps, and conclude with how key topics in the literature contribute to understanding these primary themes. The examination of the themes existing among AAS use and related research will also contribute to the body of knowledge on poorly understood motivations and policy impacts experienced by U.S. Army service members.

Literature Search Strategy

Research on AAS use has received significant attention from a variety of disciplines and focus areas. To identify literature relevant to AAS use and policy issues in Army and DoD, I conducted searches in available databases in EBSCOhost, ProQuest and Google Scholar. Databases included the Military and Government Collection, ProQuest Central, Political Science Complete, Project Muse, SociINDEX with Full Text, and Academic Search Complete. Searches initially focused only on AAS use in the military and Army, which was expanded beyond five years to identify relevant research on military and veteran populations. Literature searches were further expanded to include recent AAS studies focused on sport, youth, and fitness communities to identify research trends and focus areas on this topic. Literature that was primarily focused on medical trials or studies aimed at specific medical effects of AAS use were generally excluded as they fell outside the scope of this study.

Keyword searches in these databases included the following words, terms, and acronyms: *anabolic-androgenic steroids (AAS), appearance, performance, and image enhancing drugs (PED, PIED, IPED, APED), non-medical anabolic androgenic steroids (NMASS), testosterone, testosterone boosters, doping, physical performance*

enhancement, human enhancement, pharmaceutical enhancement, substance abuse, drug testing, military, Army, youth, sports, bodybuilding, policy, trust, harm-reduction, and *intervention*. Searches were initially conducted by combining AAS related keywords with Army and military keywords. Boolean searches consisted of AAS, PED, "*or"* testosterone derivative terms "*and"* military "*or"* Army terms. This strategy also included the use of searches with *"and"* policy, trust, "or*"* harm-reduction.

After identifying limited literature related to military populations, searches were continued based on broader population groups. Boolean searches were continued using AAS related terms *and* military and Army terms were replaced with youth "or" sport *"or"* bodybuilding terms. Literature was collected primarily from peer-reviewed sources, with some exceptions made for military-focused material that provides contextual institutional motivations or views related to physical performance enhancements. Additionally, the references of collected literature were reviewed to identify articles and studies that may have been missed during initial searches within the various databases.

Theoretical Framework

Social construction has been used in a variety of disciplines since it was first introduced by Berger and Luckmann in 1966 and has been applied more recently to public policy research (Pierce et al., 2014). Ingram et al. (2007) established a specific social framework for public policy and highlighted multiple examples of social construction studies that focused on veteran populations. They also suggest that social construction in public policy serves an important function by framing the relationship between policy development and the positive or negative construct impacts on a

population. Schneider and Ingram (2008) later highlighted that the social and policy constructs that influence a population often gain momentum that can extend the life of well-intentioned, but flawed, policies. Using this framework to examine the impacts of the Army's substance abuse policy helped provide a greater understanding of how DoD and Army policies influence the behavior of service members.

Social construction in public policy is a useful framework for understanding the relationship between targeted populations and the policies that are intended to influence those groups. Schneider and Ingram (2008) stated that social construction is about meaning making and is useful in understanding the societal, political, and individual influences that lead to the development of constructs and behaviors that further impact that society. Schneider and Ingram's (2008) framework used a social construct typology that frames how a group's social constructs are scaled along a positive or negative axis, which accounts for the level of power that group has versus the resources that are available to that group. The primary propositions of their framework focused on the use of constructs by policy leaders, the design of policy, and the impact of policy on future behaviors (Schneider & Ingram, 2008). The use of this typology was particularly useful in this study as it provided a framework to examine the impact of the power imbalance and resource access differences between the *advantaged* institutional Army constructs, versus those of service members who use prohibited AAS and fall more into the *deviant* category.

Finally, the policy design elements associated with Schneider and Ingram's (2008) framework presented a means to examine how policies are developed and the

connection those policies have with relevant social constructs. The six elements of policy design are goals or problems, rules, tools, rationales, implementation structures, and assumptions. Incorporating these policy design elements to examine the goals, rules, tools, and implementation structures of the Army's substance abuse policy also builds on Schneider and Ingram's (2008) framework on social construction; as such, they were used as supporting tools in the examination of the impact of Army policy on service members. More importantly, this framework was useful in understanding the connections and impacts between policy and a given population's behavior (Schneider & Ingram, 2008). Understanding the impact Army policy had on individual service members' motivations to use AAS further contributes to the body of knowledge on AAS use and the unique social factors related to military populations.

Supporting Typology

This study also benefited from the work of Christiansen et al. (2017), who established a typology for classifying types of male AAS users. Their work was built on Weber's (1970) ideal-type methodology and identified four AAS user ideal-types based on levels of risk, versus the levels of effectiveness associated with the individual's modes of AAS use. This includes what types or numbers of AAS are used, duration of use, dosage levels, or if they are taken by injection, orally, or topically. Christiansen (2020) explained that the risk and effectiveness dimension uses a simple low-to-high range and that the types are determined by the degree of significance an AAS user places on those two factors, which are described in Figure 1. It is worth noting that this typology refers to AAS users rather than AAS abusers, and the variations of definitions related to AAS use

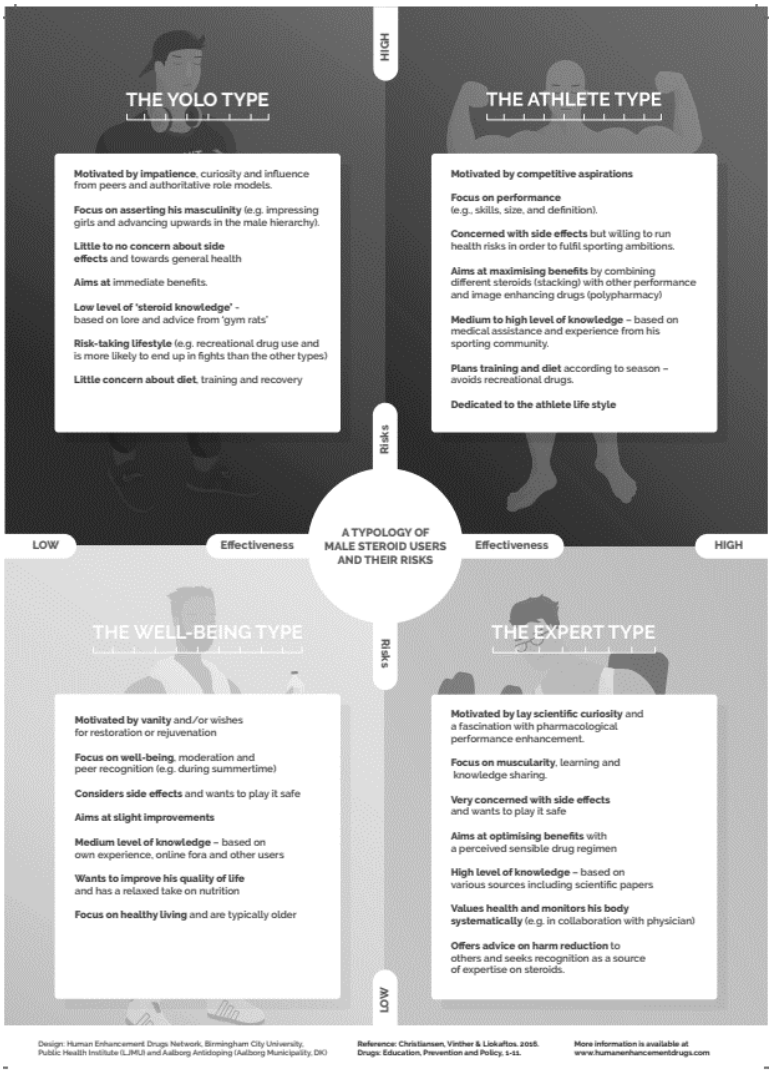
will be further discussed later in this chapter. For this typology, Christiansen (2020) defined AAS abusers as those individuals who are dependent on a constant regimen of AAS, or who are unable to adequately maintain a consistent AAS use routine. Abusers were excluded from the typology as they did not possess sufficient levels of control regarding their AAS consumption required to consider the risk, goals, and motivations, rationally.

The four AAS user types established by Christiansen et al. (2017) are the expert type, well-being type, athlete type, and "you only live once" (YOLO) type. Expert types are classified by their desire for high performance enhancing effectiveness and low-risk use. Expert types demonstrate higher levels of knowledge about AAS types and uses and seek to maximize benefits while reducing harmful side effects. Well-being types accept low enhancement effectiveness and maintain low-risk levels. Well-being types take low risks with potential side effects, have moderate knowledge of AAS, and generally accept marginal health and appearance improvements from their AAS use. Athlete types seek to maximize AAS enhancement effectiveness while accepting higher risk levels. Athlete types are motivated by competitive performance requirements, accept greater risk with side effects to achieve performance goals, and demonstrate moderate to high levels of AAS knowledge. YOLO types display lower interest in effectiveness while accepting higher risks. YOLO types are higher-risk takers who are seeking rapid results or are simply willing to try new substances without developing the level of knowledge needed to increase effectiveness. YOLO types additionally demonstrate low concerns for potential negative side effects either through ignorance or a disregard for severe or long-

term effects. This typology's focus on motivations, level of AAS knowledge, and side effect risk tolerance are useful in examining AAS use factors that go beyond basic motivators often associated with AAS use (Christiansen, 2020). This typology does not encompass all aspects of an AAS user's behaviors, but it did provide a sound framework for examining the social constructs that surround AAS use among service members.

Furthermore, this typology was complementary to a social construction and policy design framework as it addressed motivating factors, potential policy recommendations, and social factors that surround AAS use. Christiansen (2020) highlighted that understanding how AAS users attribute meaning to the social values and norms related to their use is an important part of examining their motivations and behaviors. While this typology is not tied to any single AAS using population group, it did provide a foundation for examining how anti-doping policies and institutional factors contribute to the various user-types' motivations and aims. Additionally, this typology has been incorporated into several recent studies on AAS use, particularly in studies examining how to scope interventions in a way that addresses the different motivators demonstrated by various AAS users (Bates et al., 2019b; Henning, 2022; Hope et al., 2020; van de Ven et al. 2020b; Zahnow et al. 2018).

Figure 1



Note: From "Gym Culture, Identity and Performance-Enhancing Drugs: Tracing a Typology of Steroid Use (1st ed.)," by A. Christiansen, A., 2020, Routledge. Copyright reproduced with permission of The Licensor through PLSclear.

Social Construction in Recent AAS Literature

Social construction and policy design theory has been applied to a growing body of literature in the field of public policy and public administration. Pierce et al. (2014) highlighted the breadth of this theory's use across disciplines, but also conclude that understanding the contextual factors related to power and resources available to a target population should be tested and retested multiple times to develop a deeper understanding of that population. Many social constructionist and policy design studies have focused on each of the four categories described by Ingram et al. (2007), which are *advantaged*, *contender*, *dependent*, or *deviant* groups. Based on the review of recent social construction studies, Pierce et al. (2014) demonstrated that there were some studies examining government workers in general but there has been limited use of this approach on military veterans or service members. There has been limited use of this framework when considering service member and veteran populations who also have experience with AAS use. Service members who use AAS do not neatly fall into one of the four category types and exploring how the institutional social constructs of the Army contrasted with the construct of AAS using service members merits further examination. However, examining similar sociologically framed studies provided some initial groundwork for viewing social factors related to this population group and helped shape a deeper understanding of the constructs impacting service members and veterans.

Several studies related to AAS use relied on traditional sociological frameworks with concepts that illustrated many of the same features used in social constructionist studies. The sociological framework for AAS users that was used by Bates et al. (2018)

highlighted the diverse and complex nature of AAS use, and the need to understand the social norms that influence AAS users in a similar manner used in social construction theory. The framework of Bates et al. has also been used by multiple studies (Bates et al., 2019; Harvey et al. 2019; Harvey et al., 2022; Henning & Andreasson, 2022; Hearne et al., 2020, Christiansen, 2020) that each echoed the need to understand social and cultural factors that contribute to understanding AAS use. Christiansen (2020) highlighted how social facts, or constructs, are essential to gaining a deeper understanding of the motivations of AAS users. Bates et al. (2019) also concluded that understanding the social structures, influences, and perceived positive aspects of AAS use merits further study. The need to understand culture-specific circumstances is central to social construction theory and the parallel concepts found in broader sociological frameworks complement the application of social construction studies on AAS use.

While the recent literature that explicitly relied on social construction theory to examine AAS use was more limited, these studies did demonstrate the usefulness in providing a deeper examination of the impacts that social influences have on AAS user behavior. Hutchison et al. (2018) stressed that reality for AAS users is heavily influenced by social context and focused on how the need for social validation is motivating the growth of AAS use among amateur bodybuilders. Ainsworth et al. (2022) examined how co-constructed knowledge can improve intervention methods between AAS users and physicians. Henning and Andreasson (2022) also used a narrative constructionist approach when selecting case material that best demonstrated how the behavior and views of AAS users were influenced by different prevention and harm reduction policies.

Each of these studies highlighted the usefulness of applying social construction theories to gain a deeper understanding of the constructs that influence specific population groups or examine how those constructs impact the development of policy related to AAS use.

Social construction theory was also applied to two additional works that examined performance enhancement efforts in military and sports communities not specifically addressing AAS use. Coakley's (2020) recent work highlighted the usefulness of examining social and cultural factors related to how human enhancements are viewed by society, and how social constructs among athletes influenced individual motivations for using these enhancements. He also addressed how social constructs, such as team pressure in elite sports communities, contributed to rationalizations by athletes to use pharmaceutical substances to reach peak performance levels. Bickford (2020) also used a social construction approach to examine factors that contribute to how the U.S. military sees performance enhancements for service members and how organizational performance enhancement objectives drive institutional enhancement goals. Neither work was solely or explicitly focused on AAS use, but the examination of the social constructs related to human enhancement in sports and the military communities provides key insights into a better understanding of the motivations for using performance enhancing substances within these communities.

Reasoning for Framework Selection

Identifying that the basic motivations to use AAS are based on a desire to improve strength, endurance, or physical attractiveness is readily apparent to the most cursory examination of this topic. To develop a greater understanding of these motivations and

policy impacts a social construction framework was selected to support an examination of deeper contextual factors that motivate individuals to use AAS. van de Ven et al. (2020b) highlighted the need for a multi-disciplinary approach and the need to understand the complex social context related to AAS motivations, use, and potential interventions. Additionally, Esin et al. (2014) suggested that social construction is well suited to examining diverse social connections, contradictory views, and differences in power structures that influence a population. Significant progress has been made in understanding the constructs surrounding AAS use in several areas, but there remain several gaps in understanding this phenomenon among service members.

A social constructionism approach was selected based on the continued lack of understanding related to the motivations that are promoting AAS use among service members, despite the social and institutional constructs that strongly emphasize the negative impacts of AAS use. As one of the most recent examinations of AAS use among military veterans, Whyte, et al. (2021a) demonstrated that existing gaps in research on this topic can be addressed through a social construction approach. Their study highlighted gaps in understanding AAS risk and reward tradeoffs, what social factors contribute to the introduction of AAS among service members, and what are the root motivations for using prohibited AAS. An examination of AAS prevalence and health impacts is better suited to broad quantitative testing or clinical trials, that would need to be conducted by Army and medical researchers. To gain understanding on the social and institutional norms, unique Army cultural factors, and individual risk versus reward motivations is better evaluated based on a qualitative and constructionist approach.

A social constructionism approach to this study is well suited due to the apparent disconnect in how AAS users have interpreted the facts and truths about negative AAS effects versus the information that is presented to them by the institutional Army. Mulrooney et al. (2019) pointed out how the narrative of harm associated with AAS use may largely be overstated, and that the benefits and risks of AAS use contrast sharply with other illicit substances and users' experiences. Additionally, the social constructs that contributed to the development of anti-doping policy, social perceptions, and the stigma of AAS use may not be having the intended impacts on AAS user motivations and behavior (Collins, 2019). Using a social constructionism approach, focused on the impacts of Army policy on individual motivations, supported the examination of constructed views surrounding AAS use in the service.

This approach also contributed to the body of literature on AAS use in the military by examining how Army policies impact individual service members' motivations. Answering research questions about individual motivations and institutional constructs associated with the performance enhancing qualities of AAS also provided greater insight into why the risk versus reward tradeoffs of AAS use are viewed so differently between society, the Army, and the service members who use them. This study also builds on the use of Schneider and Ingram's (2008) framework by examining how the institutional Army's power and position in the *advantaged* category impact AAS users that demonstrate both negative social constructs and resources in the *deviant* category. Finally, this study contributes to the limited use of this theory on military service members (Pierce et al., 2014). Which furthermore contributed to understanding

the effectiveness of current Army policy and highlighted areas that could minimize interventions and policy barriers so that the risks associated with AAS use among service members can be reduced.

Literature Related to Key Concepts

The overarching themes associated with AAS use literature across various disciplines and populations are focused on three principal areas: patterns of use, health issues, and policy and intervention approaches. Within these themes, key concepts emerged that further framed issues associated with AAS use. AAS related literature often addressed multiple themes and concepts that do not support strict categorization. To present these concepts in an organized manner, I first discuss concepts associated with patterns of use such as terminology, the prevalence of use, at-risk populations, and motivations for use. The second theme addresses health issues with the topics of health impacts and medical mistrust. I conclude by discussing the policy and intervention theme by covering the concepts of institutional motivations, anti-doping policy, harm-reduction policies and interventions, and frameworks for authorized use.

AAS Terminology

Unlike many policy issues, drug types, or research topics, studies on AAS are complicated by the number of terms and related substances associated with AAS. Since the isolation and synthesis of testosterone in the late 1930's the proliferation of substances, terms, definitions, laws, and policies falling under the umbrella of AAS makes examination of specific issues on this topic challenging to cover. A major barrier to addressing AAS literature is simply related to the terminology being used and what

specific substances are being referred to within this topic (Harvey et al., 2019; van de Ven et al., 2020b). Simply speaking AAS refers to synthetically produced substances that produce a physiological response that replicates that of male testosterone (NIDA, 2018a), and is almost exclusively being discussed in the context of illicit or prohibited misuse in current literature and this study.

Literature on this topic often blends the discussion of AAS with a broader range of performance enhancements that can include human growth hormone, cognitive enhancers, weight-loss drugs, and health supplements that are not easily categorized or separated in the analysis (Christiansen, 2020; Knapik et al., 2021; McVeigh et al., 2021; van de Ven et al., 2020b). Researchers must also account for the growth of designer drugs that have anabolic effects but may not be classified as AAS or accounted for on banned substance lists (Andreasson & Henning, 2019; Handelsman, 2021; McBride et al., 2018; Sagoe & Pallesen, 2018). Adding to these complications is the lack of clarity and consistency in reviewing controlled or banned substance lists.

As one example, testosterone undecanoate is an AAS that has been used in military clinical trials for performance enhancement use during military operations (Varanoske et al., 2021; Varanoske et al., 2022). The U.S. Food and Drug Administration (2019) stated that this substance is a class III-controlled substance and is described as a commonly abused AAS (NIDA, 2018b). However, this substance is not specifically listed on the U.S. Drug Enforcement Administration's (2022) controlled substance list or WADA's (2020) banned substances list. This example demonstrates how determining the classification or control of AAS substances is not easily understood, or consistently

applied across government agencies, anti-doping organizations, or dietary supplement industries. This creates issues where important literature may be unintentionally excluded or where specific findings on AAS may be conflated with other substances or issues.

Another significant issue arises when considering the variations in terminology based on the different disciplinary lenses used to examine the behaviors of AAS users. Christiansen (2020) pointed out that AAS terminology is heavily influenced based on the lens through which it is being examined. This point is demonstrated by specific terminology in literature based on specific research lenses. Literature on elite sports relies on terms associated with doping and anti-doping, banned substances, drug testing, and fair play (Henning & Dimeo, 2018; Henning et al., 2021; Hutchison et al., 2018). Literature focused on AAS use pathologies and AAS dosing regimens address additional unique terms that describe how users manage their AAS intake by stacking, cycling, pyramiding, or plateauing various substances, using different delivery methods (injection, oral, or topical), and varied dosages levels (Christiansen, 2020; Handelsman, 2021; Hearne et al., 2020; Hope, 2020; Mullen et al., 2020; van de Ven et al., 2020a; Whyte et al., 2021b; Zahnow et al., 2020). Medically focused literature includes other terms related to body image disorders, AAS dependency, drug toxicity levels, and physical and psychiatric side effects (Anawalt et al., 2019; Chegeni et al., 2021; Goldman et al., 2019; Hauger et al., 2021; Kanayama et al., 2020). Finally, criminal justice focused literature often addresses terms related to the risk of polydrug abuse, drug trafficking, drug seizures, illicit vs. licit substances, anti-drug laws, criminalization, and counterfeit or off-label drugs (Chatwin et al., 2018; Henning & Dimeo, 2018; Ribeiro et al., 2018; Salinas

et al., 2019). The variety of terms and concepts associated with these various research frameworks further complicates understanding the focus and long-term trends in AAS use studies; however, accounting for multi-disciplinary terms will contribute to understanding the social constructs that contribute to AAS use.

Finally, the use of the terms *abuse*, *use*, *misuse*, and *dependency* or *addiction* when discussing those taking prohibited AAS is important to note. While these terms are defined in Chapter 1, Smith et al. (2013) illustrated different potential usages of these terms and variations of definitions used by many organizations. As an example, taking an illicit substance or the off-label use of a licit substance is considered *abuse* under the Army's substance abuse program, as is the case with service members taking AAS without a prescription (DA, 2020b). The National Institute on Drug Abuse (2021) recommended using *use/user*, not *abuse/abuser* when talking to or describing people with substance abuse disorders. *Use* is typically reserved for describing substance use that is following its authorized or intended purpose and would not apply to the type of AAS use being examined in this study based on the Army's definition of abuse. *Dependence* or *addiction* is associated with a lack of control or a physiological response driving continual drug consumption that can be found among AAS users (Gadela et al., 2021; Kanayama et al., 2020; Kanayama & Pope, 2018). Each of these terms is valuable in discussing AAS use, but clarifying which definition is being used is important for understanding the focus of the topic.

These definitions are also important when considering how these terms influence the social constructs associated with AAS use. When considering the negative social

stigma associated with AAS use, it is often highlighted that those who use AAS do not consider themselves drug abusers (McVeigh, 2019; van de Ven et al., 2020a). The issue with AAS use being discussed along with "hard" drugs and substance abuse disorders also creates additional negative social constructs that influence individual behaviors which will be covered later in the chapter when discussing medical mistrust in the AAS community. For these reasons, this study primarily avoided referring to abuse or dependence, as the focus is centered on the more controlled user behaviors driven by individual and institutional motivators.

This topic nonetheless covers a complex range of terms, substances, and social considerations. Christiansen (2020) highlighted the need to use terminology appropriate to the context being described when discussing AAS use. Based on the consideration discussed above and to ensure that this study is appropriately focused, I applied the following criteria. When using the term AAS, I am referring to pharmaceutical substances that have androgenic and anabolic effects, are typically found on controlled or banned substance lists, and are used illicitly based on their reported performance enhancing properties. This will not include licit performance enhancing supplements or authorized testosterone treatments. Additionally, while this study did target Army policies that classify this illicit behavior as abuse, I referred to AAS *use* rather than *abuse* despite the implied illicit nature of the topic.

Prevalence of Use

When considering the issue of AAS use related to public policy, a significant portion of research literature is rooted in determining accurate usage rates in a population.

Unsurprisingly, the stigmatized or illicit nature of AAS use means determining the actual prevalence rates is difficult, and likely under-reported because people are less willing to report or discuss their AAS use (Goldman et al., 2019; Mullen et al, 2020; Whyte et al., 2021a). Conversely, Anawalt (2019) pointed out how general prevalence studies may also be overrepresented by people from high-risk population groups such as bodybuilders, competitive athletes, or individuals with substance abuse histories which would potentially over-inflate prevalence numbers if applied to more general prevalence estimates. Another issue noted about prevalence studies is that many data collection tools did not adequately define questions about AAS in a manner that would exclude non-anabolic steroids or other licit nutritional products (Handelsman, 2021; Kanayama & Pope, 2018). Drug testing is another means to collect prevalence data instead of relying on inconsistent self-reported data, but without adequate or extensive testing these methods are also flawed (Anawalt, 2019; Henning & Dimeo, 2018; Kayser & Møller, 2019). Determining highly accurate prevalence data is not essential to addressing the public health risks associated with AAS use, but establishing semi-accurate rates or trends in prevalence is important to determine the amount of attention or resources which should be focused on the issue.

Determining prevalence rates based on inconsistent survey results and changing methodologies is further complicated when considering the rapidly changing availability of AAS related substances that may not be labeled as, known as, or even intended to contain AAS. Gaining accurate self-reported AAS data is also challenged due to the variety of licit performance related dietary supplements often used with AAS (McBride et

al. 2018; Sagoe & Pallesen, 2018; Zahnow et al., 2020) and the questionable misuse of legal AAS related prescriptions (Boardley, 2020; Larsen et al., 2019). AAS may also be consumed because of the contamination of other substances (Ribeiro et al 2018; Underwood et al., 2018), or from intentionally mislabeled products containing AAS substances (Andreasson & Henning, 2018). While contamination or mislabeled products may not impact self-reported prevalence data, they could impact prevalence data from drug-testing efforts. Additionally, the development of designer substances produced to provide AAS-like performance enhancements while avoiding current laws, policies, or detection further masks effective research on prevalence (Mullen et al., 2020; Goldman et al., 2019). Ordway et al. (2021) and Larsen et al. (2019) also highlighted that the connections between AAS substances, legal testosterone treatments, and other performance enhancing dietary supplements, are also present among military populations. All of which create barriers to determining accurate prevalence rates in general populations and even in more narrowly focused groups.

Despite the challenge of getting accurate self-reported or drug testing data, recent literature does indicate that AAS use rates are increasing globally across multiple population groups (Althobiti et al., 2018; Greenway et al., 2018; Hearne et al., 2020; Hope et al., 2020; Pereira et al., 2019; Tay Wee Teck & McCann, 2018; Uddin et al., 2019; Zahnow et al., 2018). Many of these studies continue to rely on decades-old prevalence data with the more recent global and U.S. studies cited being conducted only as recently as 2014 (Pope et al., 2014; Sagoe et al., 2014). Mullen et al. (2020) were able to rely on 2018 prevalence estimates in England and Wales, and Selk-Ghaffari et al.

(2021) conducted a recent meta-analysis to determine prevalence rates among Iranian athletes. These studies are the exception regarding recent prevalence data and further highlight the lack of understanding of current AAS use rates in the United States or among the U.S. military.

Issues with determining actual use rates are further complicated by inconsistencies in reported prevalence rates across localities and sub-populations (Althobiti et al, 2018; Goldman et al., 2019; Harvey et al., 2022; Pereira et al., 2019). For example, Althobiti et al. and Harvey et al. cited prevalence rates in the United States that contrast a 1.5-2.1% prevalence among the general population against a 79.6% AAS use rate within fitness communities. This drastic difference among U.S. populations highlights the recommendation of Hearne et al. (2020) to scope the review of AAS use within a specific locality and to explore knowledge gaps associated with specific populations or regions. Therefore, global or national prevalence is relevant to this study, as understanding the extent of AAS use within the U.S. military will better inform gaps in the current literature on this topic.

The variations and gaps in global and national prevalence rates are only highlighted to a greater degree among U.S. military service members. Based on findings reported between 2002 and 2011 which indicated a 4.0% increase in AAS use in the DoD, Givens, et al. (2016) examined growing concerns about AAS use in the U.S. military. In addition to survey data showing a 5.6% AAS prevalence rate in the U.S. military, Givens et al. also reviewed several smaller population studies among specific sub-populations within the DoD which indicated AAS use rates as high as 32.0%. The

findings of Givens et al. also highlighted the limitations of DoD prevalence data as it relied on self-reported surveys that suffered from the same variations in survey methods, definitions, and terminology described by other studies discussed in this section. As with the other AAS studies, Givens et al. stated that these inconsistencies created significant challenges in observing changes in prevalence rates over time. This issue can be illustrated in the findings of Meadows et al. (2021), from the 2018 Department of Defense Health Related Behaviors Survey, which indicated that only 0.2% of respondents reported AAS use. While it is unlikely that military AAS use rates fell despite growing global rates, it is unclear how prevalent the current problem is in the Army or DoD as a whole. Despite the 2018 report of a potential decrease, Givens et al. remain the most current study addressing AAS prevalence in the DoD and continues to serve as a primary source for current literature regarding AAS prevalence in the U.S. military (Goldman et al., 2019; Kegel et al., 2020; Peltier & Pettijohn, 2018; Sagoe & Pallesen; 2018; Scharre & Fish; 2018; Whyte et al., 2021a; Whyte et al., 2021b). None of these current studies suggest that the problems identified in 2016 have diminished, nor do they indicate that progress has been made toward reducing AAS use in the DoD or that recommendations raised by Given et al. have been implemented. Given the risk factors associated with AAS use found among military service members, the absence of military related research highlights a significant gap for further study on U.S. military prevalence rates.

At-Risk Populations

Common perceptions about who is at risk for AAS use are typically directed toward elite athletes and bodybuilders. Current literature indicates an increasingly

divergent expansion of at-risk population groups that are difficult to categorize and that often do not meet common perceptions. Expanding on these common perceptions, those who use AAS are primarily older, well-educated, well-employed, males who are not associated with organized sports, but who also demonstrate traits such as high risk-taking tendencies, polydrug use, and significant athletic interests (Bates et al., 2018; Gilmore et al., 2020; Vinther & Christiansen, 2020). Franey (2018) countered common perceptions about AAS users, stating that the majority of AAS users are non-athlete motivated by cosmetic or aesthetic improvements, and Zaami et al. (2021) and Goldman et al. (2019) highlighted significant at-risk youth populations. Many of these risk factors communicate a contradictory message when trying to identify a single unifying description of who is at risk for AAS use. Because AAS literature presents such diverse socio-economic population groups, and their associated risk tolerance or motivations, it is important to focus on specific and often individual factors when considering who is at risk.

Earlier efforts to identify at-risk AAS populations in the 1990s were initially established under four broad categorizations based on sports, occupational, aesthetic, and novice users (Zahnow et al., 2018). Zahnow et al. also found that these generalizations have been insufficient for examining the deeper motivations and risk factors found in AAS abusing populations. Because the risk factors and motivations of AAS users are so varied, using the ideal-type model of Christiansen et al. (2017) to understand population specific AAS types may help identify risk factors and suggest potential treatments and policies (Hope et al., 2020; Zahnow et al., 2018). Zahnow et al. (2020) used the AAS user typology to conduct focused research on YOLO type users found among adolescents with

a history of polydrug use in the UK and concluded that the focus of AAS use interventions on the sports community over-looked other at-risk groups. They also highlighted how the high risk-taking behaviors, and low knowledge of AAS health impacts, associated with YOLO users, contributed to increased risk for polydrug use. The use of this typology to address the risk tolerance and risk factors associated with a given population can contribute to examining the types of people that are most likely to be drawn to AAS use.

Incorporating the ideal user type model of Christiansen et al. (2017) into the examination of AAS use helps address the variety of risk factors presented by AAS users. van de Ven et al. (2020a) examined this typology but highlighted that understanding the user types associated with AAS use is only a part of examining at-risk populations. Henning et al. (2022) also addressed the use of this typology to examine male AAS users in England and Wales but highlighted that they do not fully capture social and institutional factors that impact an at-risk population. Therefore, is important to examine specific risk factors and specific populations to more fully identify the social, individual, and institutional constructs and risk factors that are present among service members and veterans.

Risk factors presented by most AAS abusing populations can commonly be found in many service members. Each of the ideal user types described by Christiansen et al. (2017) demonstrated risk factors that are representative of common attitudes among military service members. Risk-taking lifestyles, focus on performance enhancement, dedication to fitness culture and a desire to improve well-being are all associated with a

military culture (Andrews et al., 2018; Goldman et al., 2019; Handelsman, 2021; McBride et al., 2018; McVeigh et al., 2021; Peltier & Pettijohn, 2018; Sagoe & Pallesen, 2018; Whyte et al., 2021a). Additionally, as with other polydrug risks, Boadley (2020) emphasized the link between licit dietary substances and AAS use. Military service members have shown extremally high levels of dietary supplement use, which has also been associated with an increased risk of intentional or accidental AAS use (Kegel et al., 2020; Knapik et al. 2021; Ordway et al., 2021). Military service members demonstrate clear risk factors associated with AAS use which should be further examined to address the associated motivations that may amplify these risks.

The ability to easily gain access to AAS through licit or illicit means further increases the risk for these population groups. The AAS industry is rooted in both the licit pharmaceutical and dietary supplement markets as well as illicit drug markets which each separately generate billions of dollars in trade each year (Hall & Antonopoulos, 2020; Handelsman et al., 2021; Kanayama & Pope, 2018). Determining the legality of AAS production sites depends on various laws and AAS can be obtained from legally regulated pharmaceutical companies or questionably legal over-seas sites (Underwood et al., 2021). Additionally, fitness-oriented at-risk populations may be motivated to use AAS as suppliers may intentionally mislabel fitness substances to mask the unregulated trade of controlled substances (Andreasson & Henning, 2018), or even develop substances to provide AAS-like performance enhancements while avoiding current laws or regulations (Mullen et al., 2020; Goldman et al., 2019). Additionally, licitly produced AAS may be obtained with treatments that may be improperly prescribed, with Larsen et

al. (2019) finding that high rates of service members in the U.S. are receiving testosterone therapy without demonstrating an actual medical need to receive these treatments.

The availability of AAS supplies through online sources has also drastically increased, but users often obtained supplies through both local and online sources (Coomber & Salinas, 2020; Koenraadt, 2020; Whyte et al., 2021a). The anonymity and ease of using online suppliers increasingly make them the preferred source of AAS and associated supplies (Ainsworth et al., 2022; Hope et al., 2020; McBride et al., 2018). Many online sources openly advertise that no prescription is required to order AAS and the consumer is responsible for ensuring their compliance with local policies or laws (Hall & Antonopoulos, 2020; McBride et al., 2018). Despite the lack of regulation or verification on the quality or authenticity of online substance, AAS users are increasingly relying on questionable online sources for AAS supplies (Coomber & Salinas, 2020; McBride et al., 2018; Whyte et al., 2021a). Coupled with potential economic incentives to increase AAS distribution, the ease of accessing AAS supplies further reduces social barriers that may inhibit AAS user motivations.

Examining the connection between at-risk behaviors, performance enhancing motivations, and ease of access to AAS is required to gain a deeper understanding of this specific population. While the ideal-user typology is a more recent framework it serves as a useful tool for examining the risks and motivations of AAS users and for evaluating targeted treatment efforts (Hope et al., 2020; Zahnow et al., 2018). While it was anticipated that each of the user types would be demonstrated by participants of this

study, limitations with using a survey collection tool prevented a deeper exploration of the key factors related to this typology during this study. Further examination using this typology with service members is warranted as this at-risk population has not been adequately researched in the current literature.

Motivations for Use

The motivations to use AAS are in the most basic form about a desire to enhance physical strength, endurance, or appearance; but a deeper examination is needed to understand the social constructs and policies that impact these motivations. Increased muscle strength, endurance, improved self-esteem, social acceptance, improved libido, treatment of low testosterone, and development of lean muscle mass are driving motivators associated with AAS use (Gilmore et al., 2020; Greenway et al., 2018; Harvey et al., 2022; Underwood et al., 2021; Hutchison et al., 2018). However, Christiansen (2020) stressed that these basic reasons for AAS use do not provide a deep understanding of an individual's motivations for taking AAS. Improving understanding of the motivations of service members who use performance enhancing AAS, and the impacts of the Army's substance abuse use policies on those individuals is essential to examining the continued rise in AAS prevalence.

It is also important to focus on predominant motivations presented by specific populations as the motivations of elite athletes or bodybuilders are likely to rely on different social constructs than those impacting the motivations of service members. As highlighted by Peltier and Pettijohn (2018) those in the military take on occupational roles that may have life or death impacts not experienced by other communities. Scharre

and Fish (2018) further pointed to mission readiness and life-saving implications related to service members, such as the ability to wear thicker life-saving armor or carry increased weapons loads that could make them more effective in combat situations. Whyte et al. (2021b) also describe a desire by some service members to increase confidence and aggressiveness when placed in combat environments, and how their AAS use helped achieve this positive effect. This limited finding by Whyte et al. is noteworthy in demonstrating unique military motivations, as an increase in aggression is predominantly constructed as a negative effect of AAS use and is often referred to as 'roid rage' (Changi et al., 2021; Handelsman et al., 2021; Kanayama et al., 2020; Mulrooney et al., 2019; Nagata et al., 2022). The severity of consequences associated with combat operations presents motivational factors that are directly supported by the potential enhancing effects of AAS use, and even associate positive motivations with behaviors that are negatively viewed under most social conditions. The physical requirements placed on service members go beyond requiring physical enhancements to win competitions or have an improved appearance. Yet there continues to be limited research on the motivations related to AAS use among service members or how these motivations are impacted by various social constructs associated with military service.

As discussed earlier regarding literature addressing AAS prevalence rates among the military, these same types of gaps are even greater when considering the motivations of service members. The work of Whyte et al. (2021b) examined service member motivations found in several studies conducted between 2010 to 2017 by various nations and identified image enhancement, weight loss, self-image issues, physical requirements

in the military, and service in hostile environments as common motivators found in the military. The subsequent research conducted by Whyte et al. (2021a) on veterans in the UK further developed an understanding of service member motivations with the primary motivations for AAS use being fitness, body size, body image, and work demands. While these motivations share similarities with other populations and are likely to be found among U.S. veterans and service members, they are not examined in context with the policies that may influence the behavior of the service members in this study. With only a single recent study found that has examined AAS use motivations with a military population, there is a significant gap in the literature regarding this distinct group and why these individuals use AAS at the risk of mission readiness, their livelihoods, and their mental and physical health.

Health Impacts

The potential negative physical and psychological health impacts associated with AAS use have been significantly examined, but there remain several limitations in determining the full extent of these health impacts. Additionally, the tendency to focus only on negative side effects without consideration of the positive impacts prevents researchers from gaining a deeper understanding of the social constructs that impact AAS use (Mulrooney et al., 2019; Peltier & Pettijohn., 2018). Simply focusing on the negative side effects will not provide a sufficient understanding of the impacts of AAS use if the potential positive effects are not accounted for (Christiansen, 2020; Mulrooney et al., 2019; Peltier & Pettijohn, 2018; van de Ven et al., 2020b). Both aspects of AAS use

should be evaluated further as an examination of both positive and negative effects has been limited.

Multiple case studies, trials, and surveys have indicated an increased risk for a variety of negative physical and psychological effects among AAS users. The most serious impacts are increased risk of cardiovascular diseases (Changi et al., 2021; Gadela et al., 2021; Handelsman et al., 2021; Kanayama et al., 2020), and sudden unexplained deaths (Bonnecaze et al., 2020; Handelsman et al., 2021; Uddin et al., 2019; Zahnow et al., 2020). Liver damage presents additional significant risks (Andrews et al., 2018; Bonnecaze et al., 2021; Kegel et al., 2020; Ordway et al., 2021) as well as increased reports of infertility, sexual disorders, thrombosis, tendon ruptures, and musculoskeletal injuries (Bonnecaze et al., 2021; Handelsman et al., 2021; Kanayama et al., 2020; Kegel et al., 2020). Psychological side effects include sleep disorders, manic and depression disorders, increased aggression, and self-image disorders (Changi et al., 2021; Handelsman et al., 2021; Kanayama et al., 2020; Nagata et al., 2022). AAS dependence syndrome also presents negative effects like other addictive substances such as withdrawal, obsession with AAS use, increased tolerance, impaired emotional control, and continued use despite clear negative impacts (Ainsworth et al., 2022; Bonnecaze et al., 2020; Christiansen, 2020; Handelsman et al., 2021; Kanayama et al., 2020). In addition to the public health impact AAS use can also negatively impact mission readiness in military units as service members are removed from service to receive required health care or experience negative reactions during military activities (Kegel et al., 2020; Larsen et al., 2019; Ordway et al., 2021; Whyte et al., 2021a;). AAS use

increases the risk of significant negative health impacts that warrant significant study and intervention policies to reduce these health risks among service members.

Studies to determine the connection between these negative health impacts and AAS use are not without their limitations. Data on the impacts of long-term use is not readily available, and the failure to control for additional substances that may also contribute to negative health impacts of AAS uses, such as polydrug use, alcohol use, and poorly regulated dietary supplements may result in overstated adverse effects (Anawalt et al., 2019; Hauger et al., 2021, Christiansen, 2020). High dosage rates also play a factor in risk levels, as there will be obvious increases in risk for an individual using AAS over someone who does not use AAS (Christiansen, 2020). Handelsman et al. (2021) also suggested that the reliance on self-reported studies over controlled clinical studies reduces the reliability of AAS research and van de Ven et al. (2020c) pointed out that there is a lack of information on how the modes of AAS use may impact health risks.

Additionally, Hutchison et al. (2018) emphasized how negative social bias has consistently limited or been present in AAS research for decades. There are also significant inconsistencies in the examination of positive and negative effects of AAS in healthy young adults, and the statistical significance of negative side effects is often unclear or absent in recent clinical trials (Andrews et al., 2018; Scharre & Fish, 2018). These findings should be contrasted with data suggesting that the most reported negative side effects are minor cosmetic issues rather than the serious cardiovascular or liver related effects discussed above (Mulrooney et al., 2019). Individuals are at increased risk

for adverse physical health effects when AAS are consumed, but limitations remain in determining how extensive those effects are.

Research on the psychological impacts of AAS use among healthy individuals also suffers from limitations in determining if negative effects are present because of AAS use or result from other existing pathologies. Whyte et al. (2021a) highlighted that the psychological effects of AAS use are even less understood than the physical effects. For example, human based studies on aggression have presented inconsistent findings regarding how AAS use may contribute to increased aggression (Changi et al., 2021). Hauger et al. (2021) pointed out that increased aggression has been demonstrated in prison and bodybuilding populations, but the presence of existing antisocial traits may also have contributed to these findings. Handelsman et al. (2021) further addressed inconsistencies in other AAS studies that may not have adequately examined the effects of AAS without accounting for or controlling for pre-existing conditions. Based on prevailing negative social perceptions about AAS it is easy to ignore these limitations and attribute the negative psychological effects to AAS as they reinforce existing negative views held on these substances. To reduce negative social bias when examining AAS use the negative effects should not be overemphasized while dismissing the potential positive performance enhancements afforded by AAS.

Unlike most substances that are prone to abuse, AAS can provide beneficial or positive effects that make them different from the “hard” drugs that they are often aligned with. The idea that “hard” drugs typically weaken individuals, while AAS can strengthen is an important factor to consider (Christiansen, 2020; van de Ven et al., 2021a). Even

when early studies using low doses of AAS suggested that AAS did not contribute to physical enhancement, the direct results experienced by those who used much higher doses demonstrated a clear performance advantage for early athletes (Anawalt et al., 2019; Kanayama & Pope, 2018; Kayser & Moller, 2020). The increase in muscle growth, strength, and endurance is the primary positive effect of AAS (Christiansen, 2020; Mullen et al., 2020; Sagoe & Pallesen, 2018; Selk-Ghaffari et al., 2021). Varanoske et al. (2021) reported that AAS treatments for U.S. Army service members did increase lean muscle mass without an increase in negative effects, with further testing being needed to examine potential improvements regarding recovery from high-intensity periods experienced during military operations. Additionally, Hart and Newton (2019) suggested that testosterone replacement could reduce injuries and improve performance in male service members. Many AAS users also report less physically related improvements such as enhanced self-image, confidence, and well-being (Mullen et al., 2020; Salinas et al., 2019; Selk-Ghaffari et al., 2021; Whyte et al., 2021a). These physical enhancements have a clear connection with increasing physical traits to meet the demands of military service, and even the potential improvements in confidence and well-being could contribute to desired military outcomes.

Examining the competing balance between risks and benefits of AAS use is important to understanding the motivations individuals have for using these substances. For example, Coakley (2020) suggested that many athletes found that the physical abuse and injury that resulted from elite levels of training were of greater risk than those associated with AAS use, and Salinas et al. (2019) pointed out that other substances can

be used alongside AAS that minimize negative side effects. Service members may see similar tradeoffs as they face the potential risks associated with intense military training or combat situations. Highlighting these positive aspects is not to dismiss the potential harm of AAS use, but as pointed out by Christiansen (2020) considering the AAS use of an elite athlete versus that of an alcoholic or drug abuser take on significantly different meanings. Most other abused substances do not present these types of positive benefits. These differences are even more apparent when considering the potential performance enhancement benefits and risk tolerance considerations when applied to military populations.

To understand the potential differences in risk tolerance between military and civilian users it is important to consider the way AAS users view side effects as opposed to the more commonly held views on the negative physical and psychological health impacts of AAS. While YOLO and well-being types are characterized as having lower AAS knowledge levels (Christiansen, 2020), many AAS users report having a high level of knowledge on the health impacts and they make risk decisions based on seeing potential enhancements benefits outweighing negative health risks (Ainsworth et al., 2022; Coakley, 2020; Gilmore et al., 2020). AAS users also report views that the negative health risks of AAS use are overstated, safer than common substances such as alcohol, and that most harmful effects can be reduced with proper modes of AAS use (Gilmore et al., 2020; Hope et al., 2020; Mulrooney et al., 2019; Peltier & Pettijohn, 2018;). McBride et al. (2018) also found that despite associated health risks only 15.0% of their respondents reported regretting the use of AAS. Christiansen (2020) further suggested

that AAS users' perceptions about the positive or negative effects of AAS may contradict studies on those effects and that the individuals perceived experience more heavily influenced behavior than the reported data did. Personal experience trumped negative social pressure or information. Ultimately, while the health impacts are important, understanding how AAS users construct their views about the positive and negative health impacts is essential to examine their motivations and how to best manage policy and intervention efforts to achieve the best balance between risks and benefits.

Medical Mistrust

Despite the growing body of knowledge on the negative mental and physical health impacts associated with AAS use, those who use AAS also regularly report a lack of trust in medical providers and anti-doping literature or policies. Recent literature that incorporates data obtained from AAS users consistently highlighted a prevailing perception that the medical community lacks an understanding of the actual health impacts or risks of AAS use (Atkinson et al., 2021; Bates et al., 2021; Bonnecaze et al., 2020; McVeigh et al., 2021; Mulrooney et al., 2019; Peltier & Pettijohn, 2018). Additionally, those who use AAS regularly claimed that their knowledge of AAS side effects exceeds that of medical providers (Ainsworth et al., 2022; Bonnecaze et al., 2020; Mulrooney et al., 2019; Peltier & Pettijohn, 2018). Kanayama and Pope (2018) pointed out that the common knowledge of performance benefits of AAS use among elite athletes was not confirmed by the medical community until 50 years after AAS had become popular in competitive sports. There are many ways of knowing the impacts of something and the experiences of many AAS users do not match the narrative of harm being

presented to them (Mulrooney et al., 2019). These attitudes toward medical information and providers are a key social factor that inhibits the effectiveness of prevention and treatment of AAS use. Furthermore, these negative perceptions and lack of trust regarding medical providers and AAS health studies are not entirely unwarranted.

Due to the illicit nature of AAS use, medical research has often relied on limited self-reported data, narrowly scoped trials and limited data on long-term impacts. Studies on the effects of AAS also typically did not replicate the dosage or stacking of other substances commonly seen with AAS users (Alharbi et al., 2019; Anawalt et al., 2019; Scharre & Fish., 2018). Medical studies have also been limited by a lack of longitudinal studies on the long-term effects of these substances due to limited AAS user population sizes before the 1980s and 1990s (Anawalt et al., 2019; Kanayama et al., 2020). Additionally, AAS literature often relied on decades-old medical studies when discussing the negative health impacts of AAS, as highlighted by a NIDA (2018a) report referencing a significant number of studies conducted before 2000. When considering the ongoing questions and limitations surrounding the actual health impacts of AAS, these earlier studies do not demonstrate findings that are based on deeply understood or settled knowledge about the potential harmful impacts. Each of these factors contributes to building barriers between AAS users and the institutions seeking to prevent, deter, or treat AAS use.

The lack of understanding of the impacts of AAS use is further compounded by literature highlighting concerns with how educated medical providers are on the health impacts of these substances. A regular issue raised on this topic is the limited education

medical providers report having regarding the effects, treatment, or social issues related to these substances (Atkinson et al., 2021; Bates et al., 2021; Bonnecaze et al., 2020; McVeigh et al., 2021; Mulrooney et al., 2019; Peltier & Pettijohn, 2018). Bonnecaze et al. (2020) reported that AAS users felt that medical providers had the lowest level of knowledge regarding AAS use when measured against other user sources of AAS knowledge. This issue is further highlighted by the conclusion of van de Ven et al. (2022) that medical staffs are often unable to provide effective treatments based on their lack of understanding of the variety of AAS substances, their effects, or even the terminology.

This issue of mistrust regarding the views of AAS users towards medical providers is an important social construct that further impacts the behavior of AAS users and policy and intervention strategies. Like other groups in the d*eviant* category on the social construction model (Ingram et al., 2007), AAS users often face a power imbalance and a lack of resources for addressing their medical needs regarding the health impacts of AAS. Ingram et al. (2007) suggested that this power imbalance negatively inhibits the individuals in an underclass from receiving effective assistance and these groups often face punitive policies. While the punitive policies and criminalization of AAS will be discussed later in the chapter, some AAS users suggested that ineffective medical treatment is directly tied to this power imbalance and issue of medical mistrust (Ainsworth et al., 2022; Hope et al., 2020). The power of anti-doping messaging further enhances the stigma related to AAS use which can also inhibit positive medical interactions and treatment for AAS users (Henning & Andreasson, 2022). Medical mistrust is a critical issue that creates barriers to providing care for those who are dealing

with significant negative health impacts, and it also reduces the effectiveness of preventative policies or education efforts attempting to convey the negative risks of AAS use discussed earlier.

While less understood than in other communities, these same concerns seem to also be present in military communities. Whyte et al. (2021a) identified a similar theme in military veterans demonstrating limited trust in medical providers' knowledge of AAS effects and treatments but lacked the same depth of findings on this issue found among other populations. Peltier and Pettijohn (2018) also suggested that military AAS users have high levels of mistrust toward medical providers, though they do not examine this issue directly with users. None of the other literature found on AAS use among military populations addressed this issue specifically. As a critical social construct related to AAS use the lack of understanding of medical mistrust among U.S. service members is another knowledge gap that could be explored in future studies as it was not a theme identified in this study's results.

Institutional Motivations

Sports communities, government agencies, and the military services predominantly maintain negative social constructs regarding AAS use, and before discussing the various policy and intervention strategies, it is important to cover the institutional motives that may impact AAS use among service members. Particular attention is needed to examine how these communities and agencies have often demonstrated conflicting institutional motivators that may promote the use of these substances, despite having views and policies aimed at prohibiting or discouraging AAS

use. Kayser and Møller (2019) illustrated this dichotomy by discussing how early AAS use among elite cyclists was ignored, or even condoned, due to the desire to display extreme levels of performance and that many athletes felt they had to use performance enhancing substances to compete in elite cycling. They further highlighted how Tour de France organizers maintained the desire to promote the elite nature of the race and maintain the race's profitability, which limited efforts to deter doping in the cycling community (Kayser & Møller, 2019). Institutional motivations that promote AAS use within a community versus institutional motivations that drive organizations to prohibit use significantly impact the social construction of policies and may influence individual motivations. Understanding these conflicting motivations found in society, and within the Army specifically, is needed to address gaps in the body of knowledge on AAS use among service members and veterans.

Institutional motivations aimed at prohibiting AAS use are tied to public health risks and negative social views regarding AAS use. In addition to the negative health risks already discussed, institutional anti-doping motivators include the potential influence elite athletes have on youth, social views about maintaining fair play in sports, and the desire to avoid government intervention in certain sports organizations (Collins, 2019; Kayser & Møller, 2019; Moore & Morrison, 2022). Kayser & Møller even claimed that the economic profitability of the anti-doping industry is a key institutional motivator for this industry to expand anti-doping policies to promote increased industry growth. Henning and Dimeo (2018) also suggested that the increase in anti-doping laws is being sought to give more power to anti-doping agencies. While these are not the only

institutional motivations of anti-doping organizations, they do highlight social factors that may create barriers to the establishment of effective AAS policies and interventions.

Institutional motivations found in military organizations may be influenced by these long-standing anti-doping agency constructs. In addition to these motivators, military organizations have additional concerns about the loss of mission readiness due to service members requiring medical treatment due to AAS use (Kegel et al., Larsen et al., 2019; 2020; Ordway et al., 2021; Whyte et al., 2021a). This motivation to reduce AAS use is tied to the public health problem created by the negative risks associated with AAS as well as how these health issues could reduce unit readiness levels. Despite the presence of institutional motivations driving the prevention of AAS use, there are opposing organizational motives that may influence increased AAS use within a given community.

When considering AAS use, Mulrooney et al. (2019) stressed that the acknowledgment or consideration of the positive effects of AAS should not be dismissed. Sport, bodybuilding, first responder, and military communities have institutional motivations that may align with individual motives for using AAS, as the increased physical performance of individuals can contribute to the increased group or community capabilities. Coakley (2020) highlighted a growing acceptance among many communities for treatments that provide enhancement beyond what is typically considered natural. Meadows et al. (2018) and Grier et al. (2018) placed further emphasis on motivations to promote holistic physical performance improvements and overall fitness in the military. Whyte et al. (2021a, 2021b) also highlighted that many veteran respondents suggested

semi-authorized encouragement and pressure to take AAS in the military, with some military medical personnel even recommending initial use for some members. Physicians in the military may also commonly provide legal prescriptions to service members for off-label performance enhancing reasons (Larsen et al., 2019; Scharre & Fish, 2018). Additionally, cultural factors related to military service such as fitness culture, machoism, and a hazing-like ethos meant to drive out those who could not meet performance expectations were identified as institutional motives that contributed to AAS use among UK military veterans (Whyte et al., 2021a). Each of these social factors associated with these institutional motivations closely aligns with the motivations of well-being, athlete, and expert AAS user types that may further justify the use of AAS by individuals within the military. While the use of AAS to support these motivations is prohibited by DoD and Army policy, further research should be pursued to examine how these institutional constructs that align with AAS user motivations could impact the behaviors of service members.

The competing nature of institutional motivations that promote a desire to maximize physical performance while prohibiting the use of performance enhancing substances is particularly relevant to military forces. Military communities across the globe have demonstrated a strong desire to find performance enhancements for their service members through pharmacological means, with some explicitly including AAS as a possible substance to meet these enhancement goals (Allenby, 2018; Caron, 2020; Goodley, 2020; Latheef & Henschke, 2020; Mehlman, 2018; Peltier & Pettijohn, 2018; Ricci, 2020; Scharre & Fish, 2018). While official positions maintain prohibitions on

AAS use, there are efforts to conduct trials aimed at improving testosterone levels in elite military units by administering AAS in a controlled manner (Grier et al., 2018; Hart & Newton, 2019; Varanoske et al., 2021; Varanoske et al., 2022). The constant emphasis the Army places on improving physical performance is a powerful motivating factor that can heavily influence individual motivations and the policies and interventions created to address AAS use.

The often-competing motivations illustrated above significantly influence the remaining key concepts discussed in this chapter as these concepts describe prevailing intervention strategies for addressing AAS use. Current anti-doping policies present the most restrictive, preventative, and punitive approach. Followed by harm-reduction interventions, which tend to seek a more neutral middle-ground approach. Concluding with the least restrictive strategies that focus on how to authorize the use of AAS ethically and safely. Examining the current literature on these intervention strategies will provide critical information on how Army policies impact service member motivation to use AAS despite the health and career risks these substances may pose.

Anti-Doping Policy

The development of AAS anti-doping policy is largely rooted in elite sports communities and relied on punitive measures to address social concerns. Anti-doping policy was largely aimed at addressing issues in competitions where AAS were being used to gain unfair advantages, with some attention being given to public health concerns and cases of unexplained sudden deaths believed to be attributed to AAS and other simulants used to enhance performance (Atkinson et al., 2021; Collins, 2019; Henning &

Dimeo, 2018; Kayser & Møller, 2019; Underwood et al., 2021). These early sports-focused anti-doping policies were further developed into criminalization policies in the 1990s and have increasingly impacted other communities with further legislative controls being added to address expanding use rates and substance availability in subsequent decades (Andreasson & Henning, 2019; Kayser & Møller, 2019). Anti-doping policies in both the Army and other communities in the U.S. have largely mirrored similar anti-drug efforts and the challenges with preventing or deterring AAS use through strict anti-doping policies will be highlighted in this section.

Before discussing the broader literature on anti-doping policies, it is important to further examine current Army and DoD policies and regulations on AAS use. The primary document that addresses the Army's AAS policy is Army Regulation 600-85: The Army Substance Abuse Program (DA, 2020b) which prohibits AAS use based on controlled substances lists found in U.S. Code and banned substances lists from the WADA code. This regulation highlights that random drug testing is the primary means of deterring drug use, but in the case of AAS testing, unit commanders must first establish that they have probable cause that a service member is using AAS before they can request special tests for banned WADA substances. Technical procedures for testing for AAS are further restricted by the DoD (2020) to only use specific laboratories, prohibit broad unit testing for AAS and place additional administrative requirements on units requesting these special tests. DoD (2018) policy on drug testing procedures does state that prevalence studies on non-standard drugs can be conducted on available samples, but it does not state if AAS are included in these studies and any results are not shared with

unit leaders if positive results are found. In addition to establishing restrictive AAS drug testing procedures, it is also noteworthy to highlight that both Army (DA, 2020b) and DoD (2014, 2018, 2020) policy documents address AAS use in the same manner as substances like cocaine, LSD, heroin, amphetamines, etc. While none of the literature on military specific populations addressed issues with stigma being associated with AAS use and "hard" drugs, the stigma discussed on the topic of medical mistrust may also be present among service members (Ainsworth et al., 2022; Henning & Andreasson, 2022; Hope et al., 2020).

When considering the Army's approach to treatment options the connection of AAS use with "hard" drugs is also continued. The Army's substance abuse program's focus on education and treatment is primarily aimed at alcohol and drug abuse disorders that present significant risk to safety, health, or mission readiness, and makes no direct mention to AAS specific treatment considerations (DA, 2020b). The Army's substance abuse sites also lack any discussion on AAS related treatment options, listing only basic data sheets on potential AAS side effects (Army Substance Abuse Program, 2022; Army Public Health Center, 2020). While no literature was located that discussed treatment options for AAS use within the Army's substance abuse program, Peltier and Pettijohn's (2018) suggestion that military medical providers also have a lack of training or experience with treating AAS use could also be an issue for the Army's substance abuse treatment professionals.

The barriers associated with the Army's anti-doping policies and regulations are also demonstrated in broader anti-doping policies that have been better examined among

other agencies or communities. A key issue with strict anti-doping policies is the reliance on effective drug testing measures (Henning & Dimeo, 2018; Kayser & Møller, 2019), and the Army's substance abuse programs use drug testing as the principal means for deterring illicit substance use (DA, 2020b). This approach is not without merit as Bates et al. (2019) noted a reduction in AAS use among youth when random drug testing policies were introduced; however, as concluded by Coakley (2020) the proliferation of treatments, substances, or technologies makes it nearly impossible to prevent the use of illicit AAS and McBride et al. (2018) noted drug manufacturers specifically developing substances that are not detected through testing. Henning and Dimeo (2018) further highlighted that testing procedures remain rife with inaccurate results that undermine efforts to ban illicit activity or protect public health. Even if testing was more effective at preventing AAS use, the Army's requirement to not conduct testing for AAS unless a unit has already established sufficient probable cause reduces the effectiveness of this policy tool. The principal tool for enforcing strict anti-doping policy is further undermined in the same Army policy that prohibits the use of AAS (DA, 2020b).

The limitations on detection and enforcement tools that anti-doping policies rely on also suffer from how the criminalization of AAS and zero-tolerance policies typically have not focused on minimizing health risks for those who do use these substances. The criminalization of AAS has often been more about protecting institutions, such as the reputation of a sports organization, rather than focusing on protecting the health of individuals (Atkinson et al., 2021; Bates & Backhouse, 2020; Henning & Dimeo, 2018). Limited buy-in from coaches or community leaders in implementing educational or

deterrent programs further reduces policy effectiveness, and many programs are perceived to be about catching users rather than focusing on the well-being of athletes (Atkinson et al., 2021). The Army's substance abuse policy did emphasize unit and leader involvement in promoting the well-being of service members through the substance abuse programs, but the implementation structure of this policy creates barriers that inhibit the ability of unit leaders to determine who needs AAS treatment (DA, 2020b). Bates and Backhouse (2020) concluded that the zero-tolerance policies in sports and the subsequent criminalization of AAS are not entirely suitable for the public, as the growing non-athlete AAS abusing populations are not associated with anti-doping monitored organizations. Mehlman et al. (2020) took this concept further by suggesting that specialized military units should move away from these restrictive policies to implement enhancements that will focus more on reducing risk rather than outright prohibition. Ultimately, anti-doping policies take an all-or-nothing approach aimed at seeking zero AAS use, generally without considering how to reduce risk or treat AAS users.

In addition to the issues described above, the social constructs associated with anti-doping policies also appear to present negative unintended outcomes. As AAS use has also been framed as being ethically wrong, these perceptions influenced the creation of anti-doping policy and further impacted public perception (Ainsworth et al., 2022; Hutchison et al., 2018). Henning et al. (2021) suggested that the social constructs contributing to these types of punitive policies have created additional risks for AAS users. Notable issues being that these policies have created a culture of secrecy and stigmatization that increases organized cheating efforts, put pressure on competitors to

use AAS, reduces the use of health care for fear of exposure, and pushes people toward environments with increased risk for other illicit activity (Ainsworth et al., 2022; Atkinson et al., 2021; Collins, 2019; Henning et al., 2021; Hope et al., 2020).

Anti-doping policies and AAS stigma have also made conducting deeper and more extensive research on the effects of AAS more difficult (Mulrooney et al., 2019), and AAS treatment in healthy individuals is often prohibited based on the presumption that the negative effects outweigh the positive or that AAS use is morally wrong (Underwood et al., 2021). Henning et al. (2022) also concluded that aggressive anti-doping policies significantly contributed to the stigma surrounding AAS use, reduced education efforts that could lower risk, and resulted in the criminalization of AAS users who would otherwise not have issues with law enforcement. All these issues are the unintended consequences of the criminalization of AAS use which impact the overall effectiveness of these policies.

Early efforts to prevent AAS use in competitive sports and to reduce public health concerns were based on well-intentioned goals and views; however, decades of study have shown that the criminalization of AAS to combat use has suffered from the same challenges in meeting preventative or treatment goals as seen in the broader "war on drugs," with AAS prevalence rates only rising globally (Christiansen, 2020; Collins, 2019; Goldman et al., 2019; Henning & Dimeo, 2018; Henning et al., 2021; Nutt, 2020). Additionally, many of the current anti-doping policies have been constructed out of social views associated with competitive sports. Christiansen (2020) suggested that sports related policies are unlikely to be effective among non-sport communities, as different

populations have different motivations, goals, and social drivers. Christiansen's (2020) assessment of policy effectiveness is notable when considering how Army policy directly relies on WADA policy (DA, 2020b). Prohibitive, zero-tolerance and stigma-inducing policies appear to have done little to stem the growth of AAS use in sports communities, and it is important to understand if these issues are also present in DOD and Army policies.

While an examination of these policy concerns has been well examined among sports and amateur athlete communities, there remains virtually no policy discussion or evaluation of AAS use in the military. Peltier and Pettijohn, (2018) touched on the need for a military policy review specifically on AAS, but there has not been a concerted examination of AAS related policy since the work of Givens et al. (2016). Scharre and Fish (2108) discussed the need for the military to review its current policies but also stated that there has not been any progress on the topic. While the Army is concerned about the health and mission readiness impacts of adverse AAS effects, it is not clear if this Army suffers from the same types of perceptions and limitations described in these other communities. Literature discussing AAS testing rates or AAS prevalence related to legal actions in the military or Army were not located in in any current material. The effectiveness of the anti-doping policies raises several questions and exploring this gap in knowledge on Army policy impacts can inform future studies on intervention policies and strategies.

Harm-Reduction Policies and Interventions

Despite the continuation of prohibitive and punitive anti-doping policies, there is a growing body of work exploring policies and interventions aimed at harm-reduction strategies rather than outright prevention. Christiansen (2020) emphasized that developing a deep understanding of a population's motivations is essential to developing the appropriate policies and education needed. Harm-reduction interventions and policies are built on the premise that AAS users have largely made a deliberate decision to use AAS, and so intervention strategies should be driven by user input that will reduce risk and harm (Harvey et al., 2019; Harvey et al., 2020; Henning & Andreasson, 2022; McVeigh, 2019). As touched upon earlier, incorporating user feedback and experiences into harm-reduction strategies is heavily influenced by user perceptions that the negative risks of AAS do not significantly outweigh the potential benefits (Moore et al., 2022 Mulrooney et al., 2020). Because many AAS users consider themselves highly informed about the risks and rewards of AAS consumption it is suggested that policy and interventions aimed at risk reduction will be more effective than outright prevention efforts (Harvey et al., 2019; McVeigh, 2019). Underwood et al. (2021) also concluded that some anti-doping policies may be limiting legitimate medical treatments for some necessary testosterone replacement treatments.

Harm-reduction based interventions are not universal in nature, but recent work on this topic has suggested several potential factors that could contribute to more effective policies regarding AAS use. The most significant emerging factor is the need for increased education on AAS and harm-reduction treatments among health providers

and the promotion of non-judgmental health care for AAS users (Ainsworth et al., 2022; Bonnecaze et al., 2021; Harvey et al., 2019; Harvey et al., 2020; Hope et al., 2020). These efforts can reduce stigmatization, increase clarity in research efforts, and promote AAS user willingness to seek health care. Needle exchange programs have also been identified as means to reduce the risk of blood-borne complications, but exchange sites also have the stigma of being associated with "hard" drug use or addiction (Ainsworth et al., 2022; Atkinson et al., 2021; Harvey et al., 2020; Hope et al., 2020). Harm-reduction interventions are built on the premise that AAS use has overall harmful effects and limited public value and this emerging area of study is a viable topic for future research as more current policies are explored.

As an emerging focus area, the current literature on this topic does highlight several issues with these types of intervention strategies. Chatwin et al. (2018) pointed out that research on treatment for enhancement related drugs is often not included in other drug treatment and intervention studies. Recent efforts to determine the effectiveness of behavior-change interventions and cessation treatments failed to demonstrate specific tools or interventions that reduced AAS use (Bates et al., 2019a; Bates et al., 2019b). Atkinson et al. (2021) also pointed out that it is difficult to secure funding to invest in intervention programs due to stigmatized views of AAS. Despite these ongoing efforts Bates et al. (2021) suggested that research on effective interventions has not kept pace with broader AAS research, and there is limited data on what types of interventions or tools are most effective. Henning and Andreasson, (2022)

and van de Ven et al. (2020c) also echoed the call for continued research on the topic of harm-reduction interventions.

As for applying these findings and recommendations to service member populations, research on this topic is even further behind than in other areas. Unlike the work being done in other communities to improve understanding on user motivations and intervention feedback, the limited research being done on military service members means that the essential groundwork for developing harm-reduction strategies has not begun. By researching the policy impacts and motivations of service members this study can contribute to filling this gap and provide a basis for examining potential harm-reduction policies in the military.

Framework for Authorized Use

In contrast to prohibitive anti-doping policies, and the more neutral harm-reduction interventions, there is a growing body of work in both civilian and military communities that examined potential ethical frameworks for authorizing pharmaceutical use to enhance physical performance. Moore and Morrison (2022) specifically discussed the use of AAS to achieve performance goals in competitive sports, and Peltier and Pettijohn, (2018) suggested that the military should at least conduct further research on implementing the controlled use of AAS. Hart and Newsom (2019) further recommended that long-term trials for examining the potential injury reduction and physical enhancement benefits of AAS should be pursued. The work of Varanoske et al. (2021) and Varanoske et al. (2022) also sought to determine the acceptable use of AAS in military settings and demonstrated movement toward limited authorized use of AAS

despite current policy prohibitions. The idea that militaries should seek ways to enhance service members is not new and work that examined how to enhance service members in a safe, ethical, and moral manner is ongoing (Allenby, 2018; Caron, 2020; Goodley, 2020; Latheef & Henschke, 2020; Mehlman, 2018; Peltier & Pettijohn, 2018; Ricci, 2020; Scharre & Fish, 2018). With a few exceptions, the literature on this topic within military communities does not refer to AAS directly and typically uses generic terms such as pharmaceutical performance enhancements without addressing any specific substance. The emphasis on developing a framework for implementing pharmaceutical enhancements is a significant contextual and social construct related to the previous discussion on institutional motivations.

Militaries around the globe are committed to exploring appropriate safeguards for implementing performance enhancing pharmaceuticals that currently exist or will be developed in the future. Ethical questions are central to this type of framework but determining what is ethical relies on the appropriate balance of each of the other factors discussed in this section (Allenby, 2018, Caron, 2020; Goodley et al., 2020; Lathee & Henschke, 2020). Of note is the idea that combat situations create contextual implications that could support the adoption of ethically acceptable uses of performance enhancing substances (Goodley et al., 2020; Lathee & Henschke, 2020; Mehlman, 2020; Ricci, 2020; Scharre & Fish, 2018). What is ethically acceptable is admittedly subjective, but current literature offers emerging frameworks for examining this topic.

While the literature on establishing an appropriate framework for human enhancements is exploratory in nature, due to the many unknowns associated with

untested or theoretical substances, the literature on this topic raises several common issues. On one hand, some suggested that there is a military and national obligation to give service members the greatest advantage for survival and that the military operates under different social constructs than the public (Caron, 2020; Mehlman et al., 2020; Ricci et al., 2020). Caron also argued that enhancing service members beyond natural capabilities is not inherently immoral or unethical. On the other hand, questions remain about the extent that a society is willing to accept enhancements that are well beyond natural abilities or if the impacts of enhanced versus non-enhanced people would be significant (Allenby, 2018; Christiansen, 2020; Goodley et al., 2020; Mehlman et al., 2018). So, several key aspects are suggested to help determine the appropriateness of a given enhancement and build essential boundaries on the implementation of enhancing substances.

Ethical frameworks for the authorized use of performance enhancing pharmaceuticals or AAS naturally require sufficient emphasis on the safety of those substances, but it is also acknowledged that there is likely to be some level of risk accepted regarding negative side effects (Caron, 2020; Mehlman et al., 2020; Scharre & Fish, 2018). Understanding the ability to reverse enhancements and determine long-term effects or care requirements is also critical to determining appropriate enhancements (Allenby, 2018; Goodley et al., 2020; Mehlman et al., 2020). Additionally, informed consent is vital to ethically administering enhancements to service members, as well as establishing the criteria for when these enhancements could be mandated or declined (Caron, 2020; Goodley et al., 2020; Mehlman et al., 2018). Latheef and Henschke (2020)

suggested that there are conditions that could override a service member's ability to decline enhancements while in service but cautioned that the socially constructed power imbalances between the military leadership and the service member make the service members particularly vulnerable. Additionally, questions arise when considering how institutions may differentiate career incentives for those who accepted enhancements and those who declined enhancements and subsequently performed at different levels (Caron, 2020; Goodley, 2020). This issue creates further concerns when accounting for the lack of understanding of female AAS users, who could experience greater health risks while gaining lower performance benefits even if they consented to AAS enhancements (Ainsworth et al., 202; Harvey et al., 2022; Mullen et al., 2020). Finally, to authorize enhancements policymakers need to account for legal issues associated with enhanced service members (Allenby, 2018). These enhancements could create legal liabilities due to the untested nature of performance enhancements in the context of international laws of war, such as questions about if service members could be legally responsible for their actions based on potential side effects of a given enhancement (Caron, 2020; Goodley et al., 2020). Addressing the safety risk versus performance benefits, informed consent parameters and legal implications are essential to establishing authorized use policies that would be socially acceptable.

These types of policies represent the least restrictive approach to accounting for AAS use, particularly in the context of the military, and would rely on a deep understanding of the constructs surrounding AAS. Goodley et al. (2020) pointed out that existing social constructs, norms, and views will significantly impact the feasibility of

implementing these types of frameworks or policies. Ricci et al. (2020) also highlighted that the public has a key role in determining if the risks, benefits, levels of consent, legal, and ethical considerations support enhancement efforts. While AAS may not ultimately fit into this kind of framework, reducing the gaps in knowledge on service members' motivations, current policy impacts, and other social constructs are needed to contribute to future work on how to best address performance enhancing substances. The trends in AAS prevalence suggest that the use of AAS, or similar enhancing pharmaceuticals, will not decline. Gaining a greater understanding of this topic is needed to develop effective policies that best balance risks and benefits.

Summary

Current literature on the topic of AAS use presents a variety of terms, population groups, social constructs, and potential policy approaches while also demonstrating five key gaps in knowledge. Themes in the current literature present extensive literature focused on patterns of AAS use, health issues, and policy and intervention approaches. This literature also highlights key gaps in understanding use rates, health impacts, service member specific motivations, medical trust issues, and military policy impacts. The lack of recent literature focused on military AAS users means that knowledge on this topic had to be drawn from various other target populations and the trends identified may not fully align with those experienced by military populations. While the findings related to the concepts discussed in this chapter may be replicated among military populations, without specifically examining the unique social factors related to this group incorrect assumptions could be made about how to best address this problem.

Literature that addressed concepts associated with AAS patterns of use highlight the complex and diverse nature of AAS terminology, prevalence rates, risk factors, and individual motivations for using AAS. Overall, these concepts highlighted the significance of studying this topic due to the growing use rates and potential health crises resulting from this issue. There are also two major knowledge gaps presented by the literature on these topics. First, efforts to determine actual prevalence rates are inconsistent, limited, and potentially under-reported depending on the population group in question. Second, emerging literature illustrates a broad range of motivations for using AAS among individuals and the lack of study on service member motivations undermines future research associated with Army policy development. Addressing the gap in understanding military prevalence rates would require extensive drug testing measures and was beyond the scope of this study. This study did focus on contributing to improving understanding on the motivations of service members who use performance enhancing AAS.

Key health related concepts address public health issues and social constructs which are critical to understanding how Army policy impact service members' decisions to use AAS. Understanding the positive and negative effects of AAS use, as well as the limitations of current research on these effects, highlighted important constructs related to how AAS users interpret health information, make risk decisions, and manage power imbalance between themselves and medical providers. First, the limitations associated with medical research on the effects of AAS do present an additional gap about the health impacts of AAS that should be addressed. Second, there is a gap associated with the lack

of understanding of the views or trust levels service members have in medical providers. While both gaps are important to understanding the social constructs related to AAS use they were not within the scope of this study.

Finally, literature on institutional motivations and various policy approaches illustrate what is known about the effectiveness of current policies versus what is not known regarding emerging interventions. Literature on institutional motivations and potential authorized use frameworks highlighted several social factors that may positively or negatively impact the individual motives of AAS users in the military; however, the lack of policy or intervention related literature examining military populations presented another gap in knowledge on AAS use in the military. Literature examining the impacts of anti-doping policies and harm-reduction interventions was almost exclusively focused on sport and body-building populations. This study was aimed at building on the work that has been done in other communities while contributing to a deeper understanding of the impacts Army policy has on AAS using service members.

There are multiple gaps in the literature regarding AAS use among military populations, particularly within the Army. This study was focused on two major gaps aimed at improving understanding of the motivations of service members who use performance enhancing AAS and the impacts of the Army's substance abuse policies on those individuals. In Chapter 3 I describe how the use of a qualitative approach, recruitment of service members, and collection of narrative survey data allowed me to add to a deeper understanding of these gaps. The research design and methodology described in the next chapter demonstrates how gaining insights into the social constructs

and experiences of service members and veterans allowed me to contribute to understanding AAS use in the military.

Chapter 3: Research Method

Introduction

The purpose of this qualitative study was to improve the understanding of the motivations of service members who use performance enhancing AAS and the impacts of the Army's substance abuse policies on those individuals. The central phenomenon is the public health concerns associated with AAS use among U.S. service members and veterans, and the limited understanding of how the Army's substance abuse policy impacts the negative health risks or positive physical enhancements associated with service members' AAS use. The questions asked in this study are about understanding the social constructs that have shaped the Army's substance abuse policy and how those constructs have impacted service members' motivations to use AAS despite significant legal and health risks.

To address the gaps found in the literature discussed in the previous chapter, I describe in this chapter the research design, methodology, and issues of trustworthiness that were applied to this study. This qualitative study used a social constructionist approach with narrative analysis to understand AAS user motivations presented by service members, and examined how Army policies impact those motivations. By recruiting service members and collecting narrative data through survey responses, I conducted narrative data analysis to gain a deeper understanding of the constructs that drive policy and AAS use in the military. This contributes to the body of knowledge regarding what is understood about AAS user motivations and Army policy impacts.

Research Design and Rationale

To provide a deeper understanding of AAS use in the U.S. military and reduce the gaps found in the current topical literature, this study aimed to address questions about how policy and social constructs impact AAS user motivations. Specifically, this study sought to answer how the Army's substance abuse policies impact the motivations and experiences of service members who use AAS, and how social views on "fair play," mission readiness, and physical performance cultures in the service impact service member's motivations to use AAS.

Answering the posed research questions was essential to understanding why service members use AAS despite the significant health, legal, and career risks. The problem with growing AAS prevalence in the military is based not only on the potential health and mission readiness risks but also on the power imbalances between the Army and individual service members. This is because social and institutional constructs may potentially contribute to pressures placed on service members to use AAS to meet performance and mission requirements. Additionally, the social constructs that contribute to Army policy and institutional and individual motivations were targeted to highlight possible limitations in current policies and consider alternative policy approaches.

A qualitative study was best aligned with answering these questions as this approach provides a deep understanding of contextualized social experiences of individuals (Creswell, 2009; Kim, 2016). Within this approach, narrative inquiry based on social construction theory was appropriate to examine how individuals make meaning of the social influences around them, as well as examining how power imbalances could

impact those experiences (Esin et al., 2014). Qualitative research by Whyte et al. (2021a) on military veterans with a history of AAS use in the UK highlighted key social factors that may impact Army personnel and concluded that additional qualitative research was needed to understand individual motivations and their meaning. Ingram et al. (2007) highlighted that understanding the social context of why a policy was developed could help explain subsequent behavior because of those policies. By collecting narrative data, I was able to examine the interrelationships between constructed views and the subsequent actions of those groups (Patton, 2015). This allowed me to look beyond the predominantly quantitative data or medical information that has been the focus of recent literature on AAS use in the U.S. military.

Role of the Researcher

My role in this study was to examine the social constructs, power imbalances, and policy impacts on the motivations and experiences of service members who use AAS to meet performance requirements in the Army. To fill this role, I organized survey material and collected and analyzed narrative survey data. I also ensured that attention and sensitivity were given to the ethical and personal experiences conveyed by participants. Analyzing open-text survey entries allowed me to highlight key topics and minimize participant risks while seeking to understand how these individuals construct meaning related to AAS use, Army policy, and missions. Obtaining narrative information from service members in leadership roles who do not use AAS also facilitated understanding important institutional constructs. Additionally, narrative survey questions allowed

participants to maintain complete anonymity while still providing material that I examined to identify themes and constructs.

Ensuring the anonymity of participant information was a primary requirement to ensure that I was able to obtain the most open and honest narrative data. Protecting survey data and masking identifiable information in the responses also helped maintain privacy and protection. The potential social and professional ramifications of exposing an individual's prohibited AAS use were critical concerns, and I ensured participants were not placed in compromising situations. Fully anonymous surveys, limitations on collected demographic information, and other identifiable material were rigorously reviewed to ensure participant anonymity was maintained.

As a currently serving U.S. Army Officer, I do have a deeper understanding of military culture, institutional norms, and policies related to substance abuse. The use of peer-feedback and the collection of additional surveys from non-using service members reduced any perceived biases regarding participants who reported prohibited substance use. I further ensured that I minimized my personal bias about AAS use and Army policy by including alternative views from non-using service members in leadership positions. Concern about potential power imbalances between myself and participants of lower ranks was also not a factor due to the anonymous nature of the surveys. Participants may have been able to determine my service status, but the risk of undue influence due to a power imbalance was determined to not be substantial due to the nature of the recruiting and collection methods.

Methodology

Efforts to understand AAS use among service members have typically focused on narrowly intensive case studies or broad quantitative prevalence studies aimed at negative health impacts or usage patterns associated with AAS use (Whyte et al., 2021b). While some studies have examined broad user motivations, there have been limited efforts to understand deeper experiences lived by AAS users (Gilmore et al., 2020; Greenway et al., 2018; Whyte et al., 2021a). To address these gaps this study targeted under-examined service members, collected survey data, and conducted narrative analysis to better understand the social constructs that are impacting service members who use AAS. This methodology allowed me to answer this study's research questions and contribute to the body of knowledge on this topic.

Participant Selection

To gain a greater understanding of how U.S. Army service members construct their views in a way that motivates them to use prohibited AAS, participants were drawn from active-duty and veteran populations. Service members in leadership roles, without a history of AAS use, were also included to contribute to understanding the social constructions, enforcement of the Army's substance abuse policy, and unique military norms. The target group of interest was individuals with a history of AAS use that were active-duty U.S. Army service members. Participants were primarily found in physically demanding specialties such as special operations and infantry units; with responsibility for maintaining high fitness and mission readiness levels. Participants also include those

without a history of AAS use that have responsibility for administering the Army's substance abuse policies.

The limited nature of studies on motivating factors related to AAS use in the U.S. military allowed for a broader initial sampling strategy. Identifying more exploratory trends regarding the ideal AAS user types was a first step toward addressing gaps in the current literature. Prior research samples typically focused on military-wide data or limited case studies (Whyte et al., 2021b), which have not provided a deep understanding of motivational experiences among service members. While determining an ideal participant pool size is not clearly defined, Kim (2016) highlighted that the commonly recommended range for narrative-focused research is between 6-25 participants. Some literature focused on qualitative AAS motivational data and included more participants than recommended in this range (Underwood et al., 2021); recent interview-based studies have typically ranged between 6-16 participants (Gilmore et al., 2020; Greenway et al., 2018; Whyte et al., 2021a). Large survey based AAS literature consisting of hundreds or thousands of participants have typically addressed more quantitative usage patterns, prevalence rates, or medical effects focused research (Alharbi et al., 2019; Bonnecaze et al., 2020; Gilmore et al., 2020; Hope et al., 2020; Knapik et al., 2021). Two mixed-method or multi-staged studies relied on questionaries followed by interviews, and each included approximately 100 participants (Atkinson et al., 2021; Harvey et al., 2020). The use of open-text narrative survey questions allowed me to use a smaller sample pool than those found in these studies. The focus on smaller targeted data sets allowed me to

remain closer to the recommended qualitative narrative research range, rather than relying on survey-based studies with large sample sizes.

Narrative surveys are limited due to their inability to pose follow-up or clarifying questions. Kim (2016) reinforced the limitations associated with narrative surveys but pointed out that this method can work when targeting specific themes. For this study, gaining anonymous narrative data on specific themes related to user motivations and policy impacts allowed me to answer the research questions. Faulkner and Trotter (2017) described achieving data saturation when no new information is being presented, and that it can be anticipated that continued collection efforts will repeat earlier findings. I had anticipated the need for exceeding the recommend range for narratives-based studies with a sample size of 20-30 participants to ensure that I received data from each of the different AAS-user types; however, I was able to find data saturation within the recommended range of narrative focused research, with 15 valid responses without the need to identify response from each AAS-user type. Data saturation was established for participants with and without a history of AAS use as the narrative became repetitive within each subpopulation.

This sample size allowed me to focus on sampling primarily from infantry communities with participants from a variety of special operations or infantry units. As AAS research has typically focused on male participants (Bates et al., 2018; Gilmore et al., 2020; Vinther & Christiansen, 2020), finding both male and female participants was desired but not expected based on the demographics of these communities. Ideal sampling was also based on ensuring collections from four to six participants from

enlisted, warrant officer, and commissioned officer ranks, to examine potential differences among the ranks. Capturing data from a broad range of ranks proved to not be essential to answering the questions raised by this study, as respondents did not demonstrate significant differences between the ranks. When considering non-AAS using participants, I anticipated reaching data saturation with a pool of four to six participants as the highly prohibitive nature of Army and DoD substance abuse policies was anticipated to result in a narrower range of responses on the policy impacts from leader perspectives.

A larger total population often associated with survey instruments was not anticipated to be necessary to answer this study's research questions, as prior research has focused on quantitative data rather than gaining a deeper understanding of individual motivating factors on this topic and their respective lived experiences. Due to the gaps in knowledge on U.S. military AAS users, understanding user motivations and policy impacts was possible with the sample size described and will support further research that may rely on more extensive interview-based research.

The primary criteria for inclusion and exclusion of participants in this study were centered on active-duty or veteran service members with a history of AAS use from the year 2000 to the present. Veteran, national guard, and reserve participants were included if they had served on active duty within the last 5 years. While I primarily targeted physical performance-oriented career fields, participants from other specialties were included, such as military police, artillery, or armor communities that also place a high emphasis on physical performance or combat roles. The determination that participants

met this inclusion and exclusion criteria was based on self-reported information about that individual's service status. Participants' service records were not requested or used to confirm self-reported information. Based on shifting terminology related to AAS, it was anticipated that participants would be excluded based on the exclusive use of over-the-counter drugs, non-prohibited performance supplements, or authorized testosterone treatments that may be related to AAS. This was the case even if those treatments or substances are commonly abused without a prescription since the focus of this study was on prohibited AAS use, but none of the participants provided information that indicated they met exclusion criteria. Others were excluded from the study due to their service history or experience with the Army's substance abuse programs.

Instrumentation

The primary data collection instrument this study used was a fully anonymous survey protocol focused on addressing questions about individual motivations and risk tolerance, social and institutional constructs, health and policy knowledge, and policy impacts and feedback. The basis for the development of survey questions was from literature on AAS use in the military, the ideal AAS-user typology, personal experience in the military, and feedback from other service members. The recent study of Whyte et al. (2021a) on military service members in the UK also influenced question development about motivations, risks, and knowledge levels, but it lacked a connection to policy issues. Additionally, as the work of Whyte et al. and many other AAS studies have focused on examining modes of AAS use, how users obtain AAS, and the extent of negative health impacts already, this study did not seek to further address those issues.

Relying on the work of Whyte et al. allowed me to build on the work with UK veterans and develop questions related specifically to U.S. service members and respective Army policies and cultural and institutional. Based on these considerations, the survey guide in Appendix A was developed to facilitate surveys with service members who have a history of AAS use. A secondary question set was included as a branch of the primary survey for non-AAS using policy administrators or unit leaders and is also presented in this appendix.

The use of an electronic survey instrument for narrative data collection allowed me to reach a sufficient recruiting pool as potential participants were likely to be uncomfortable or unwilling to participate in other types of data collection techniques, such as interviews. Due to the stigmatized nature of AAS use, or the potential legal ramifications of admitting AAS use directly to me as an actively serving officer, these other collection methods were not feasible. Survey questions were primarily structured to obtain open-text narrative entries that could contribute to narrative data analysis. Limited demographic information was also included to determine inclusion and exclusion criteria. The use of an open-text survey instrument allowed me to collect sufficient narrative data to answer the questions raised by this study regarding user motivations and the social constructs associated with Army policy. The structure of the survey and questions were built on the SurveyMonkey website, and appropriate links and recruitment material were distributed with the Institutional Review Board (IRB) approval number 12-01-22-0553365.

The use of a survey instrument allowed me to collect qualitative narrative data to answer the questions raised by this study regarding user motivations and social constructs associated with Army policy. Before beginning recruitment and data collection efforts, I also conducted a pilot survey with volunteer participants with prior service and experience with substance abuse policy. This pilot was used to evaluate questions' alignment with the research questions and study purpose. The results of the pilot survey are further discussed in Chapter 4 of this study.

Recruitment and Data Collection

Participants were recruited from active-duty and veteran service member populations to conduct anonymous narrative surveys and relied on distributed and electronic recruiting methods. A broader recruiting method was required to ensure that participants were from a variety of units and regions. Recruitment postings were initially distributed through personal social media pages such as LinkedIn and Facebook, with invites to personal associates to further post and distribute the participant recruitment flyer (Appendix B) on their individual social media pages as well. Secondary recruitment posts were also made on Reddit (n.d.-a, n.d.-b) targeting communities such as *Special Forces: Special Operations Forces*, or *Natty or Juice* which periodically have targeted posts on AAS use in the military. These posts resulted in two to six responses per week, with four to six responses being included in the final study. Additional postings were not made through public fitness community sites or electronic gym message boards in communities surrounding large military installations as initially planned. These additional

recruitment efforts were not required due to sufficient response and data saturation being received through the primary recruitment efforts.

Partner organization requests with non-government or government organizations were not pursued as a secondary recruitment source for this study, as the primary informal recruiting efforts resulted in sufficient participants. Current service members were directed to not use any Army resources to distribute recruitment information, including government emails, as the targeted service was not a partner organization for this study. Physical recruitment flyers were also not used or placed in any locations based on sufficient primary recruiting results.

Data collection through surveys was focused on obtaining a single completed survey with an approximate duration of 10-25 minutes. Survey transcripts were downloaded from SurveyMonkey and saved on a password protected computer. I also maintained research notes taken during periodic reviews of the responses, with the final survey transcript and notes being uploaded in MaxQDA for data coding and analysis. Participants exited the study upon completion of their survey with no requirement or means to conduct follow-up surveys. Participants were provided debriefing material at the end of the survey consisting of researcher contact information and study publication estimates and information.

Data Analysis

The data collection plan that best fit this study was a narrative analysis plan because it provided a deeper understanding of the motivations that contribute to a service member's decision to dismiss medical risks and Army policies and regulations. Esin et al.

(2014) highlighted that narrative analysis is well suited to examining how individual, social, and institutional narrative connections drive social constructs that will then further influence the phenomena in question. An analysis plan focused on the relationship between service members and their larger Army community allowed me to collect narrative experiences that contribute to understanding the motivations to use AAS by service members, and the impact of Army policy on those users.

While narrative analysis is less reliant on specific coding, the initial identification of key terms, phrases, and AAS trend information, allowed me to identify recurring concepts expressed in the surveys. Initial coding focused on four key themes consisting of motivations, risks, knowledge levels, and policy impacts (refer to Table 1). Within the motivational theme, narrative material was coded to identify phrases related to the individual's fitness goals, body size, body image, potential benefits, and work demands or Army cultural influences. Risk and knowledge themes addressed codes such as side effects, quality assurance, AAS knowledge sources, Army AAS policy knowledge, and dosage levels. Finally, policy themes focused on terms such as punitive actions, drug testing, and desired or recommended policy and intervention methods. This analysis plan allowed me to examine triggering events in the individual's narrative, how those events impacted them, and what meaning they attributed to their experience (Kim, 2016). The themes identified in Table 1 associated with M1, R1, K1, and P1 connected data to RQ1 about user motivations and Army policy. The subsequent themes associated with M2, R2, K2, and P2 helped answer RQ2 about the social constructs that impact AAS users in the service. In this study, I examined the individual and institutional constructs that motivate

service members to use AAS, how policy impacts behavior, and the resulting constructs formed from Army policies and AAS use.

Table 1

Coding Framework and Abbreviations

Major Themes and Code	Subthemes and Code
Individual motivations to use AAS while in Army(M1)	Pre-service history of AAS use (M1a)
	Fitness goals related to strength and endurance (M1b)
	The desire for increased body size or intimidation factor (M1c)
	Improved body image (M1d)
Individual risk, benefits, and safety decisions (R1)	Risk assessment of negative physical effects of AAS use (R1a)
	Risk assessment of negative mental effects of AAS use (R1b)
	Perceived positive physical effects of AAS use (R1c)
	Perceived positive mental effects of AAS use (R1d)
	Risk versus reward tradeoff assessment (R1e)
	Quality assurance of AAS (R1f)
Reported individual knowledge of AAS effects (K1)	Determination of AAS effectiveness or training best practices (K1a)
	Knowledge sources (K1b)
	Reported knowledge about medical effects of AAS (K1c)
Impacts of Army AAS policy on AAS user experiences (P1)	Influence of policy on individual use motivations (P1a)
	Experience with testing, treatment, or punitive actions (P1b)
Institutional pressures or norms impacting AAS use motivations (M2)	Army or unit physical performance demands (M2a)
	Career progression related to fitness levels and performance (M2b)
	Common usage among peers or leaders in a unit (M2c)
	High intensity demands of combat operations (M2d)
	Negative views or stigma about AAS (M2e)
Risk, benefits, and safety impacts on mission readiness (R2)	Negative risk to mission readiness or unit (R2a)
	Perceived positive impacts on mission readiness or combat operations (R2b)
Reported individual Knowledge of Army AAS policy and programs (K2)	Description of Army AAS policy, testing procedures, punitive measures (K2a)
	Experience with the Army's substance abuse treatment programs or educational material (K2b)
Feedback and recommendations for Army AAS policy (P2)	Assessment of the effectiveness of Army AAS policy (P2a)
	Recommended changes to Army AAS policy (P2b)
	Treatment options or needs desired by AAS users (P2c)

Survey transcripts were reviewed throughout the data collection process to identify broad ideas and assess data saturation. Following the completion of data collection, survey transcripts were coded in MaxQDA using keyword searches and then manual personal reviews. This allowed for first, and second coding cycles that helped establish perspectives and patterns related to the material and then refine and categorize coded data (Saldana, 2013). The breadth of AAS literature provided an excellent foundation for identifying relevant codes and themes that were found in this study. While additional subthemes related to unique military social constructs were identified, I did not encounter any significant discrepant cases that were well outside the themes examined. The limited discrepancies on minor motivating factors were noted in Chapter 4, but they were not used to base broad conclusions on or incorporated into the final findings.

Issues of Trustworthiness

To ensure trustworthiness in the design of this study, I focused on confirming credibility, transferability, dependability, and confirmability using established standard and tested techniques. Shenton (2004) highlighted that the qualities of credibility, transferability, dependability, and confirmability are well-established topics for determining trustworthiness in qualitative studies. Within this section, I will describe the appropriate strategies that were used to ensure that trustworthiness was established and maintained throughout the study.

To ensure internal validity and credibility, I primarily relied on peer debriefing with other military officers and graduate-level students to provide feedback. Henry

(2015) pointed out that peer debriefings ensure that outside parties assist in providing objective feedback, incorporating overlooked information, or evaluating discrepant cases. Peer feedback was provided by other officers and doctoral scholars after they reviewed consolidated narratives without my initial notes, coding, or summaries. This ensured that outside feedback was provided without being influenced by my personal bias. Ensuring saturation with an appropriate number of participants was also critical to establishing credibility by providing a broad range of participant responses.

To address issues of transferability and dependability, I maintained variations in participant selection, and the use of audit trails and triangulation. The distributed recruiting design for this study ensured that I included participants from a variety of military installations, units, occupational specialties, and ranks. This ensured that I could extrapolate findings that could reasonably be applied to other Army populations in the future. By maintaining audit trails on survey response frequency and duration, field notes, and demographic data as part of my research journaling, I further demonstrate participant variations and the process for developing my findings. Korstjens and Moser (2018) highlighted that multiple collection methods increase understanding of the topic in question through the triangulation of various data sources. Triangulation between various data points was completed by reviewing findings in similar AAS studies such as Whyte et al. (2021a), comparing narrative material against stated Army policy objectives and deterrence tools (DA, 2020), and recommended AAS intervention and treatment methods. This allowed me to compare reported participant experiences with stated Army policy goals, and other AAS studies, and provided insight into the interests and power

balance demonstrated in this institution (Saldana, 2013). The use of survey instruments, as well as collecting data from various regions, further ensured that a variety of narrative data sources from AAS using and non-using service members were examined.

To establish confirmability, I relied on reflexivity to examine my internal views, constructs, and values related to AAS use in the military. Korstjens and Moser (2018) emphasized the need to review internal factors in my role as the researcher to examine how I see and think about the data as I collect and analyze it. By conducting research journaling to establish my preconceptions and recording my own survey responses as a non-AAS using officer, I identified potential biases before beginning data collection. The use of reflexive field notes and observations throughout the data collection and analysis process also reduced the distortion of my findings due to my internal views. This ensured that other researchers could replicate this study and reasonably expect to make similar conclusions.

Ethical Procedure

Ensuring that this study was conducted ethically and transparently was critical to protecting participant confidentiality, privacy, security, and consent. The first step to conducting this study was through the completion of the IRB process with Walden University. This process ensured that my responsibilities as the researcher were clearly defined throughout the recruitment, consent, and data collection stages. Furthermore, this process allowed me to refine appropriate recruiting material, notifications, and consent forms.

This study relied on informal and voluntary recruiting methods that allowed participants to examine the purpose of the study before initiating a survey. The target population for this study was not a vulnerable population, which reduced the ethical risk associated with this study. The demographic data and survey material collected did not permit the identification of participants from a vulnerable adult population, nor was it anticipated that this study would require additional protections if a vulnerable adult did volunteer to participate. Additionally, this informal recruitment method and completion of surveys without Army resources removed the need to seek additional approvals from the Army for recruiting active-duty service members.

Privacy concerns and potential legal risks were avoided as participants' identifying information remained anonymous and voluntary throughout the process. Participants were provided a copy of the informed consent form at the beginning of the survey and could not proceed to the survey without selecting "I consent." While participants could provide identifiable material in the open-text response, identifying information was discouraged and none of the responses collected demonstrated any information that could lead to the identification of the participants. This included the Internet Protocol (IP) addresses of participants, which were not collected during the data collection process. Surveys were 100% anonymous and transcripts from SurveyMonkey did not include survey participants' source data. To further mask participant information, participants were assigned a coded identifier based on occupational specialty, rank, region, status, and gender to maintain anonymity throughout the study and the peer-feedback process. Survey material was reviewed in a private office environment and

participants were encouraged to select equally private environments, but they were responsible for maintaining the level of privacy they were comfortable with. The anonymous nature of the surveys also removed any professional obligations I had to report violations of Army policy as I could not provide information about individual participants or their respective AAS use.

As this study did involve questions about illicit and stigmatized AAS use, these privacy measures were essential for protecting participants throughout this process. While participant well-being issues related to stigmatization were low, it was anticipated that there would be minimal risk due to the voluntary and anonymous nature of the surveys. The open-ended nature of the survey questions did not suggest that AAS users would be in any additional harm or discomfort from discussing AAS use in a private setting. To further address privacy and anonymity concerns transcripts and research material were secured on password-protected devices only accessible by me. Potentially identifiable information was not placed in the published material, and none was identified during data analysis.

There were also minimal personal or professional relationship risks or potential conflicts of interest expected during this study. Based on the limited interaction I have had with the occupational specialties that were targeted for this study, existing relationship with participants was not anticipated. While personal contacts were used to distribute recruitment material these individuals were discouraged from conducting a survey, but this could not be verified based on the anonymous collection efforts.

The completion of the IRB process and the use of the informed consent forms further ensured that ethical concerns were addressed, and participants were adequately protected throughout this study. The recruiting material and informed consent forms addressed the privacy, data protection, legal, and anonymity concerns discussed above. Informed consent forms and all research material will also be maintained on a password-protected storage device for a minimum of 5 years.

Summary

The research method used in this study provided a trustworthy, transparent, and organized design that can contribute to the body of work on AAS use by addressing motivational and policy impacts related to this topic. The use of the well-established social construction theoretical framework provided an excellent method for addressing the gaps in knowledge regarding the motivations and policy impacts of AAS users in the Army. By collecting narrative survey data from various service members and veterans I was able to ensure trustworthiness and address ethical concerns while I analyzed the social constructs that surround user behavior and the role that policy has on that behavior. Analyzing narrative data allowed me to further identify potential policy impacts and social constructs related to this issue.

Chapter 4: Results

Introduction

The purpose of this qualitative study was to improve the understanding of the motivations of U.S. Army service members who use performance enhancing AAS, and the impacts of the Army's substance abuse policies on those individuals. To develop understanding of these motivations and policy impacts, I examined narrative survey responses from service members and veterans that have a history of AAS use or experience with the Army's substance abuse policies related to AAS use. Data collection was focused on answering two questions about how substance abuse policies impact the motivations and experiences of service members who use AAS, and how social views on "fair play," mission readiness, and physical performance in the Army impact service members' motivations to use AAS.

In this chapter, I present the results of this study by first describing the pilot study, the setting, participant demographics, and how data were collected. The remainder of the chapter will address how the data were analyzed, the evidence of trustworthiness, and the overall results of the study. These results will describe how answering this study's research questions contributes to the body of literature on AAS users by examining the unique social constructs that influence individual behaviors and experiences of service members. Most significantly, these results indicated that the level of policy impact on user motivation is heavily dependent on the level of enforcement of Army policy and that individual or Army related social constructs often outweighed the potential deterrent effects of Army policy as a result.

Pilot Study

A pilot study was conducted by collecting online survey responses from five personal acquaintances with doctoral or Army experience. The pilot study survey was built on the SurveyMonkey website and was opened between 02-04 December 2022. Volunteers who completed the pilot study were provided a recruitment flyer, an informed consent form, and a unique link to the pilot study survey. The pilot study allowed me to conduct proofing, survey logic flow, survey timing assessments, and assess survey question alignment with research questions. The pilot study had limited impact on the final survey instrument as the feedback noted only minor wording suggestions or survey tool errors related to page formatting. The pilot study did prompt some adjustments to the organization of subthemes that were used in the final data analysis strategy. These adjustments primarily focused on aligning subthemes that promoted AAS use with motivations themes and the subthemes that discouraged AAS use with risk themes. These changes are reflected in Table 2, which is presented and discussed in further detail later in this chapter. Once formatting and data analysis issues were adjusted, the pilot survey was closed. The final survey was generated by duplicating the updated pilot study survey and a separate and unique survey link was created for the final survey.

Setting

Participants in this study completed an anonymous online survey at the time and location of their choosing. Due to the nature of anonymous surveys, I cannot determine conditions that may have influenced their responses. As the survey did require narrative responses, participants likely completed the survey with personal computers, and it is

plausible that the partial responses that skipped many narrative questions were due to accessing the survey on handheld devices that did not support extensive narrative data entry. Additionally, the absence of incentives or rewards for completing the survey further reduced any potential influence on participation in the study.

Demographics

Twenty-six survey responses were collected for this study with 15 determined to be valid. Three responses were removed from the survey based on falling outside the target population due to the lack of recent experience in the Army or lack of experience with the Army's substance abuse programs and policies. An additional eight responses completed portions of the survey but were excluded, as they did not provide significant narrative data. All responses were provided by male respondents, which is consistent with the high percentages of males in the targeted career specialties and historical AAS usage demographics (Vinther & Christiansen, 2020).

Of the 15 valid responses used in the study, six were commissioned officers, one was a warrant officer, and eight were enlisted. Participants reported that their years in service ranged from 1 to 27 years, with an average of 14 years-in-service. Thirteen participants were on active duty, one was in the national guard or reserves, and one was a veteran with active-duty service within the last 5-years. Eight participants were from the ideal occupational specialties related to infantry or special operations units. Three responses were also included from secondary target occupational specialties of armor, artillery, and military police. Responses from three additional participants, who listed their occupational specialty as "other," were also included in the final study. It was

initially assumed that participants from less-physically demanding specialties would not provide data unique to the AAS use by service members; however, these responses were included as their narratives did address answers to the research questions by highlighting specific social constructs associated with Army culture or policy.

Responses were collected from participants from a variety of regions based on their most recent duty location. Two to three responses were collected from five of the six major regions that cover most Army duty locations, with one response from the remaining region. The inclusion of responses from each region ensured that participants were not localized to the same locations or units. Finally, the total valid responses were comprised of nine participants that stated they had a history of AAS use and six responses that noted experience with the Army's substance abuse programs related to AAS but no personal history of AAS use.

Data Collection

A total of 15 online surveys were included as valid responses in this study, with participants answering both demographic and narrative questions. Respondents initially answered six demographic questions to determine their service status and occupational specialty experience. Question #7 was used to determine the participants' history of AAS use, and question #8 was used to screen respondents without a history of AAS use for experience with the Army's substance abuse programs and policies. Participants with a history of AAS use then completed 14 narrative questions, with nine surveys including full or partial narrative responses to these questions. An additional six participants with no history of AAS use completed a similar question bank with 15 narrative questions.

The alternate question bank for these participants included nine of the same questions from the primary question bank, which focused on Army and social constructs and policy impacts. The remaining six questions were modified questions about their experiences and perceptions of AAS use during their service. The survey was first opened on SurveyMonkey on December 10, 2022, with the last survey collected on January 20, 2023. The recruitment flyer (Appendix B) was posted to a stand-alone Reddit page that was linked to other Reddit communities and posted to my personal social media pages on December 10, 2022. Additional flyers were also emailed to other personal contacts between December 13-27, 2022, along with invites to post the recruitment flyer on their social media platforms. Unique survey links were used for each recruitment source. In all, five responses came from Reddit, four responses from my personal social media posts, and six responses came from the social media posts of my personal associates.

Participants volunteered to complete the anonymous survey on their own time, with completion time for valid responses ranging between 9-56 minutes at an average of 26 minutes. Total survey responses peaked following initial recruitment posts, with 10 responses collected during the first week; however, these responses also included the most partial or incomplete responses, with most partial responses coming from the Reddit based link. The remaining weeks ranged between two to six responses per week, with response rates trending down till the survey was closed. Data were recorded directly on the SurveyMonkey website, which captured text or multiple-choice responses that could be viewed with data grouped by question number or as complete individual surveys. Access to the survey results was protected by password, based on my SurveyMonkey

account, and downloaded survey data were maintained on password protected devices. No unusual circumstances were encountered during the data collection process.

Data Analysis

Narrative data were analyzed by conducting keyword and phrase searches and manual coding focused on the key themes and codes initially described in Table 1 in Chapter 3. Iterative coding cycles allowed me to identify key responses while remaining focused on the narrative experiences provided by the respondents. Initially, un-coded responses were reviewed, while responses were grouped by question throughout the collection process as surveys were completed. This early review allowed me to identify broad trends in the responses, update coding strategies and gauge data saturation. Once data collection was complete, coding focused on keyword and phrase searches related to four key themes consisting of motivations, risks, knowledge levels, and policy impacts.

This was followed by subsequent manual coding of individual responses. This analysis supported the examination of significant events in the individual's narrative, as well as identifying over-arching perspectives specific to each participant. These coding cycles and focus on individual narratives also allowed me to determine the impact and meaning of those events on the individual (Kim, 2016). Survey responses were coded using Max QDA data analysis software.

I first identified keyword searches that were associated with each of the four primary themes established in my data analysis plan. For example, keywords such as *body image, fast, strong,* or *big* were associated with the motivation theme, while *drug testing, treatment*, or *punishment* were associated with the policy theme. This process

was repeated for each theme so that key narratives could be identified and highlighted for manual coding. Once keyword searches were completed for each primary theme, I manually coded additional narrative data and organized codes into their appropriate subtheme. This also allowed me to identify additional words and phrases that were associated with separate subthemes or used to generate new subthemes.

The manual coding that followed the keyword coding of each narrative response allowed me to refine codes and identify the primary themes related to AAS use, social constructs in the Army, and AAS user typology. Once coding was complete, I was able to examine narrative themes grouped by question type or organized by the primary themes. This allowed me to examine different narrative materials that shared similar ideas from multiple respondents and question types. I analyzed the data a third time by reviewing narrative responses by question to examine any themes that emerged based on the context of the specific survey question. As one example, questions about participant knowledge of Army substance abuse policy highlighted contrasting views on the policy knowledge subtheme between using and non-using participants. Following the adjustments made during the pilot study and final data analysis phase, the final themes, subthemes, and codes were organized in Tables 2 and 3, which are found after this section. These tables also include the frequency with which these codes were presented in the data collected.

Out of the four initial themes identified, respondent narratives focused primarily on the themes of motivation and risks. While data related to knowledge and policy did emerge, the narratives presented limited details or experiences associated with specific themes on the *influence of policy on individual use motivations* (P1a), *experience with*

testing, treatment, or punitive actions (P1b), and *reported knowledge of Army policy and programs* (K2). While the primary themes were not changed, the notable subthemes that emerged during the final data analysis were *reckless AAS use* (R2dg), and *unit enforcement variations* (P1c). Additionally, respondents did not provide any narrative data indicating that they had *pre-service history of AAS use* (M1a).

Many of the themes identified in this study were consistent with those presented in current literature on AAS use. Examples of *individual motivations to use AAS while in the Army* (M1) presented in this study, such as seeking improved performance, greater endurance, social acceptance, improved libido, and treatment of low testosterone, were common to factors highlighted in recent literature on user motivations (Gilmore et al., 2020; Greenway et al., 2018; Harvey et al., 2022; Underwood et al., 2021; Hutchison et al., 2018). Other unique military factors such as *high intensity demands of combat operations* (M2d) regarding mission readiness and combat readiness issues raised in other literature (Peltier & Pettijohn, 2018; Scharre & Fish, 2018) were also present at a high frequency, even among participants that did not have a history of AAS use. Similar military-focused motivations associated with *increased body size or intimidation factor* (M1c) were also demonstrated with increased frequency over that which was noted in limited cases by Whyte et al. (2021b). In contrast, *Negative views or stigma about AAS* (R1f, R2c) associated with "roid rage" (Changi et al., 2021; Handelsman et al., 2021; Kanayama et al., 2020; Mulrooney et al., 2019; Nagata et al., 2022) were also present in responses from both AAS using and non-using participants. One participant indicated that the stigma or shame associated with his AAS-use influenced his decision to cease using

AAS to meet his performance goals. Others indicated that stigma-related risks were associated with both individual and institutional factors that influenced their motivations to use or not use AAS.

Themes associated with i*ndividual risk, benefits, and safety decisions* (R1) and *risk, benefits, and safety impacts on mission readiness* (R2) were also well articulated in a manner consistent with current literature. It is noteworthy that the risks discussed by the participants in this study did not focus on the most serious health risks raised in the literature such as an increased risk of cardiovascular diseases (Changi et al., 2021; Gadela et al., 2021; Handelsman et al., 2021; Kanayama et al., 2020), sudden unexplained deaths (Bonnecaze et al., 2021; Handelsman et al., 2021; Uddin et al., 2019; Zahnow et al., 2020), or liver damage (Andrews et al., 2018; Bonnecaze et al., 2021; Kegel et al., 2020; Ordway et al., 2021). Risk themes presented in this study were described in more general or non-specific terms but consistently demonstrated both positive *reward-over-risk* (M1e) or negative *risk-over-reward* (R1c) risk tradeoff decision making that was highlighted by Whyte et al. (2021a). Additionally, risk related to the *reward-over-risk* (M1e) subtheme also emphasized narratives that align with the findings of Mulrooney et al. (2019), which highlighted that many AAS users believe that the negative effects of AAS are overstated.

The frequency of themes related to *reported knowledge of Army policy and programs* (K2) and *impacts of Army AAS policy on AAS user experiences* (P1) were limited compared to other literature on this topic. In this study, responses generally did not provide the narrative depth required to determine specific AAS user types or assess user experiences with the Army's treatment programs. Participants did not typically

convey details about their level of knowledge on AAS effects, AAS performance effectiveness, or risk tolerance needed to classify a participant as a specific AAS-user types described by Christiansen et al. (2017). One participant clearly described having a high knowledge of AAS effects, a high focus on AAS effectiveness, and low risk tolerance that is consistent with the expert type, and another suggested a high-risk tolerance that is more representative of a YOLO or athlete type; however, respondents generally did not provide sufficient detail to fully examine the various user types.

There was also a lack of knowledge of the Army's treatment or training programs as demonstrated by respondents having little to no experience with these programs. Efforts to examine potential AAS user-driven treatment interventions as found in current literature were limited based on this gap in service member user experience (Bates et al., 2019b; Henning, 2022; Hope et al., 2020; van de Ven et al. 2020b; Zahnow et al., 2018). Participants with and without AAS use histories noted the lack of medical treatment for AAS users, which is consistent with AAS user experiences in these other studies. While there was limited policy and intervention feedback provided in this study, it did not present the depth of understanding needed to place greater focus on these themes.

The responses collected in this study did not present any significant discrepant cases from participants, regardless of if they did or did not have a history of AAS use. One respondent did describe that his AAS use was motivated by factors not found in other literature when he stated, "I want to be a more patient father. I want to be a more loving and caring husband." In the context of his entire survey, this participant's overall narrative indicates that this motivation was about the overall improvement in his health

afforded by AAS use as a form of testosterone replacement therapy, which also improved his interaction with his family. His AAS use was used to treat what he describes as mission related drops in his testosterone levels that the respondent perceived to be impacting his behavior with his family. While further examination of this unique motivator was desired, the survey responses provided did not elaborate on the connection between this motivation and his AAS use; however, as the treatment of low testosterone is consistent with other literature (Larsen et al., 2019), the overall narrative provided was consistent with other responses and the discrepancy of this unique motivational factors was not factored into the findings of this study.

Another limited discrepancy was noted from a participant that reported an economic motivator that was derived from distributing AAS to fellow service members. Economic motivators were not noted in current literature on this topic and were not considered to be inside the scope of unique social constructs related to AAS use in a military context. This instance was noted as it did relate to *common AAS usage among peers or leaders in a unit* (M2c), but the economic motivation was excluded from my results.

Table 2

Code Frequency and Alignment with Research Question #1

Themes, Subthemes, and Codes	Frequency
Individual motivations to use AAS while in the Army (M1)	53
Pre-service history of AAS use (M1a)	0
Fitness goals related to strength and endurance (M1b)	12
Increased body size or intimidation factor (M1c)	10
Improved body image or mental factors (M1d)	12
Reward-over-risk (M1e)	19
Individual risk, benefits, and safety decisions (R1)	49
Risk of negative physical effects of AAS use (R1a)	11
Risk of negative mental effects of AAS use (R1b)	9
Risk-over-reward balance (R1c)	11
Risk to career (R1d)	5
Quality assurance of AAS (R1e)	3
Negative social views or Stigma (R1f)	10
Reported knowledge of AAS effects (K1)	40
AAS effectiveness or training best practices (K1a)	18
Knowledge sources (K1b)	9
Knowledge about medical effects of AAS (K1c)	13
Impacts of Army AAS policy on AAS user experiences (P1)	40
Influence of policy on individual use motivations (P1a)	18
Experience with testing, treatment, or punitive actions (P1b)	9
Unit enforcement variations (P1c)	13

Table 3

Code Frequency and Alignment with Research Question #2

Themes, Subthemes, and Codes	Frequency
Institutional pressures impacting AAS use motivations (M2)	163
Army or unit physical performance demands (M2a)	57
Career impact related to fitness and performance (M2b)	10
Common AAS usage among peers or leaders in a unit (M2c)	34
High intensity demands of combat operations (M2d)	25
Positive AAS impacts on unit (M2e)	7
Positive social views on AAS (M2f)	30
Risk, benefits, and safety impacts on mission readiness (R2)	47
Negative risk to mission readiness or unit (R2a)	12
AAS usage among peers and leaders discouraged (R2b)	6
Negative social views or Stigma (R2c)	12
Reckless AAS use (R2d)	17
Reported knowledge of Army policy and programs (K2)	21
Army AAS policy, testing, punitive measures (K2a)	15
Experience with AAS treatment or training (K2b)	6
Feedback and recommendations for Army policy (P2)	43
Assessment of the effectiveness of AAS policy (P2a)	12
Recommended changes to Army AAS policy (P2b)	20
Treatment options or needs desired by AAS users (P2c)	11

Evidence of Trustworthiness

To ensure trustworthiness in this study, I focused on maintaining credibility, transferability, dependability, and confirmability throughout data collection and analysis. While participants provided a variety of individual personal experiences that cannot be generalized across all service members, this study was designed to be objective and reduce bias in the results and conclusions. In this section, I describe the evidence of trustworthiness that was derived from my study design in Chapter 3.

Credibility and validity were maintained principally through peer debriefing with U.S. military officers and doctoral-level students who were not involved in the pilot

study survey. Henry (2015) emphasizes how peer debriefings promote objectivity through feedback, analysis review, or the examination of outlying data. Peer feedback was obtained by asking other officers and doctoral scholars to review narrative data and introductory information about this study's purpose and research questions. Those who provided peer feedback were not given the codes or subthemes that I had developed and were asked to describe the trends and themes that they found relating to the research questions. They were also asked to highlight any outlying or discrepant cases. After providing their feedback, I also presented a summary of my results and conclusions for additional feedback. The feedback provided demonstrated a general consistency with my interpretations, and no significant oversights were identified. Peer feedback helped to reduce any induced personal bias regarding my analysis and conclusions, by ensuring others would similarly interpret this study's results.

Achieving data saturation further contributed to the validity of this study by allowing me to compare internal study results with the results reported in other current AAS literature. Common motivational factors regarding performance benefits were demonstrated in a manner consistent with recent literature (Gilmore et al., 2020; Greenway et al., 2018; Harvey et al., 2022; Underwood et al., 2021; Hutchison et al., 2018), as well as emerging motivations regarding unique military factors (Peltier & Pettijohn, 2018; Scharre & Fish, 2018; Whyte et al., 2021a). Data saturation was achieved for the major themes related to the research questions but was limited when considering the different AAS user types as described by Christiansen et al. (2017). While this ensured that content validity was established well enough to answer the

question raised by this study, it fell short of establishing representation by the different AAS user types in the AAS user typology. Which prevented me from making a conclusion or interpretation of the different user types in the Army.

Evidence for the transferability and dependability of this study's results were maintained primarily through the variations in participant selection and triangulation between different user occupational specialties, AAS use history, unit regional locality, and current literature. While individual user responses did vary based on a participant's lived experience, the themes and ideas found in their narrative response are likely to be demonstrated through other similar studies. Participant's narratives were further triangulated with the experiences reported by AAS users in other population groups such as Saudi gym users (Alharbi et al., 2019), self-medicating testosterone replacement therapy users (Underwood et al., 2021), and UK military veterans (Whyte et al., 2021a). Additionally, the framework and design of this study could be transferable to other population groups which may have unique social constructs related to a societal requirement to increase physical performance, such as other DOD services or police or other first responders. Audit trails were also critical to establishing dependability as the unique survey links were able to ensure that respondents were obtained through different sources and could be recorded along with response frequency and duration. In addition to SurveyMonkey reports that track this data, my analysis, notes, and summarized data and codes are maintained for review.

Confirmability was evidenced through my reflexivity efforts that examined my personal views by capturing potential biases during the completion of the non-AAS user

survey and through research journaling. By reviewing my personal views and role as a researcher, I identified my personal biases toward the themes and analysis being conducted. Narratives that presented themes in close support or opposition to my personal views were noted during research journaling to ensure that these themes could be objectively reviewed and analyzed. As one example, I was biased toward the idea that service members would directly connect AAS use motivations with the demands of combat operations. Through research journaling and reflexivity, I was able to highlight my interpretation of this topic during peer-debriefings to ensure I accounted for the opposing themes that were identified in some responses. Notably, many participants indicated that combat operations did not require high physical performance in many circumstances.

The trustworthiness strategies established in Chapter 3 and continued throughout the study ensured that I was able to maintain credibility, transferability, dependability, and confirmability throughout this study. Other researchers could replicate my study design and expect similar data sets and results. There were no significant factors or challenges that arose during this study that required changes to my established strategies.

Results

The results of this study are presented for my two research questions and focused on the four major themes established in Chapter 3. Within this section, I describe how the results associated with the social factors and narratives describing the motivations, risks, knowledge, and policy themes answer this study's research questions. I will first focus on themes aligned with RQ1 and how each of these themes influenced the construction of

user motivations due to the Army's substance abuse policy. RQ2 will be discussed next and address these themes as they relate to the variety of social factors that further impact user motivations. Some subthemes do impact both research questions and will be noted in cases that significantly influence the primary focus of each question.

Policy Impacts on AAS User Motivations and Experiences (RQ1)

The impacts of the Army's substance abuse policy on AAS user motivations were typically not addressed directly in respondent narratives. Several subthemes highlighted how Army policy indirectly impacted the participants' motivations and experiences with AAS use during their service. Army policies did motivate some service members to avoid AAS use, but most participants chose to ignore punitive policy risks when they determined that AAS use supported their overall physical enhancement motivations. Notably, when the impact of Army policy was reduced by limited enforcement, other motivational factors increased in prominence in ways that outweighed potential career risks. The results discussed in this section will focus on specific subthemes with the most significant impacts on the participants of this study. With particular attention on how variations in unit enforcement contributed to conditions that reduced the deterring effects of Army policy.

The narrative data obtained during this study demonstrated high levels of consistency regarding the impacts that Army policy had on AAS user motivations. The most common policy impact cited by respondents was associated with *unit enforcement variations* (P1c) which consistently highlighted that relaxed Army policy enforcement created conditions which limited the deterring effects on those who were motivated to use

AAS. Participants indicated that despite a prohibitive AAS policy, these substances were not regularly tested. This resulted in policy measures creating low barriers related to the use of AAS among service members.

This subtheme is best represented by a respondent that described Army policy as a "zero tolerance policy. Publicly. At the end of the day it comes down to leadership and how they feel about it." Further responses addressing this factor highlighted how some units "knew about [AAS use], no one cared," that "typically the Army doesn't care," or "it wasn't a big deal." Some even described units that "turned a blind eye" to AAS use. In contrast, others described how "the wrong officer" knowing about AAS use could lead to serious punishments, and another respondent pointed out it was "the luck of the draw" about how an individual's leadership enforced Army policy. Due to this factor, user motivations were typically based more on other individual, social, or institutional factors, and Army policy prohibiting AAS use influenced user motivations when leaders were focused on it.

Issues with the enforcement of Army policies, as described above, does not mean that Army policy has a limited impact on motivations for all service members. One response noted that "by in-large*[sic]* commanders enforced [policy] because they had to. I think given the opportunity many of them would use [AAS]." One participant highlighted that the career risk associated with not adhering to Army policy motivated him to stop using AAS as he increased in rank and responsibility. Another noted that Army policy did keep people from using AAS, but he also clarified that "I think those around me would use [AAS] if legal." So, Army policies do have some impact on

deterring AAS use among service members, but its effects may be limited when service members disregard the policies based on personal views and risk decisions associated with their AAS use.

These responses suggest that the open disregard of Army policy further reduced the barriers to using AAS despite some participants highlighting that there is some deterring impact associated with Army policy. The impact that Army policy had on deterring AAS use was noted when considering the c*areer risk* (R1d) associated with getting caught using AAS. While the frequency of this subtheme was low, responses did stress the serious legal and career risk associated with AAS use. Coupled with this factor was the *risk-over-reward* (R1c) theme which indicated that the career or health risks did impact the long-term use of AAS among some participants. Multiple responses indicated that the participants stopped using AAS because they found the risk outweighed the benefits, but only one participant indicated that this was due to Army policy directly. Most references about ceasing AAS use appeared to have been about other career or health risks. Additionally, the policy impacts from career risks that may reduce AAS use appeared less frequently than other motivating factors which were more associated with supporting the decision to use AAS.

These career risks were further minimized when considering how participants described *Army AAS policy, testing, punitive measures* (K2a). Participants with a history of AAS use indicated greater familiarity with testing procedures and highlighted that limited testing was based on commander requests and that AAS testing is not typically done. Some participants without a history of use appeared less sure about if AAS were

regularly tested for, which could potentially contribute to how units address AAS policy. While there were limited data on this subtheme, barriers to implementing regular AAS testing procedures may further weaken the impacts of Army policy on user motivations.

Based on the potentially limited policy impacts arising from enforcement and testing barriers, common motivational factors associated with fitness goals, body size, libido, and other positive factors likely have greater bearing on user behavior. Positive performance enhancing motivation factors were highlighted with high frequency across multiple subthemes (M1b, M1c, & M1d). Responses on these subthemes stressed numerous potential benefits from AAS use. Coupled with the reported *AAS effectiveness or training best practices* (K1a), participants with a history of AAS use predominantly highlighted the positive impact of their AAS use. Not all AAS users indicated high effectiveness from AAS use, and non-AAS users appeared more skeptical of the positive benefits and effectiveness. Despite a lack of consensus on its effectiveness, both respondent groups indicated that positive AAS effects typically outweighed the potential risks if used responsibly.

While the *reward-over-risk* (M1e) subtheme did not present a significantly higher frequency than the *risk-over-reward* (R1c) the focus of participants' responses indicated a greater emphasis on AAS use having a positive tradeoff over risk. One participant highlighted this idea when he stated, "Even understanding the potential negative side effects of use, I don't regret using [AAS]." Other responses, even among non-using participants, highlighted that effects could be properly managed to significantly reduce the risks linked to AAS and that many potential negative effects were likely over-

emphasized. The reduced impact of Army policy already discussed above is likely to contribute to shifting the balance between risk or reward as potential career risks are minimized.

The individual balance between risk and reward was also impacted by some participants based on the *positive AAS impacts on [the] unit (M2e).* While this subtheme was associated more with social factors regarding AAS use in the Army, it is worth noting here due to its impact on the individual motivations of some participants. Some narratives reflected the idea that Army policy hindered some positive effects that AAS use could offer service members. One participant noted the need for enhancement to perform at the pace demanded by his unit, and another noted the need for men on combat deployments to be on testosterone treatment. The idea that policy has a negative overall effect, by limiting performance enhancements for some military units, further undermines the deterrent goal stated in the Army's policy goals. Particularly as AAS is more widely accepted by service members to support their mission readiness goals.

Direct references to how Army policy impacted user motivations were low, but the participants described how the implementation of Army policy could impact users. The connection between the narrative themes in this study highlighted how the lack of policy enforcement, the potential lack of knowledge regrading testing procedures for AAS by unit leaders, and positive motivational factors often shifted how participants balanced their view on the risk and rewards associated with AAS use. Either because unit leaders believed AAS was part of routine tests or they knowingly turned a "blind eye" to its use, Army policy did not appear to significantly impact the AAS user motivations

examined in this study. The experiences collected in this study suggest that the limited impact of Army policy likely contributed to service members identifying greater potential rewards or motivations in the absence of significant health or career risks. When coupled with the broader social themes examined in the next section, the participants in this study typically focused on motivating factors that were not directly associated with Army policy.

Social Impacts on AAS User Motivations (RQ2)

In contrast with limited policy enforcement, or potentially because of those limitations, social constructs significantly impacted service member behaviors and their motivations to use AAS. Motivational subthemes ranged from indirect social constructs such as physical performance demands in the Army, to direct connections between AAS usage among peers and leaders. The social constructs related to AAS use further highlighted contextual experiences that impacted user motivations, such as the impact of combat operations, or how reckless an individual's AAS use was. Additionally, the lack of experience that participants had with the Army's AAS treatment programs and the positive social constructs regarding AAS use impacted how service members viewed AAS use within the service. Finally, participant feedback on Army policy further demonstrated how service members constructed their views about the social and policy impacts of AAS use in the Army.

Social factors and institutional constructs heavily influenced user motivations and contribute to environments that appear to promote or contribute to AAS use among service members. The contextual experiences of service members are illustrated by one

participant, with a history of AAS use, who described how service members and leaders viewed AAS use:

> In my opinion in a flippant manner. [AAS] exist, if people want to do them they will… as a medic I would try to dissuade them from using them and educate but if they still were going to do it I would help them to try to ensure it is done as safe as possible.

As Army policy had less impact on user motivations, individual and institutional motivating factors appear to have greater impact on participant behaviors and experiences. Even service members without a history of AAS use highlighted similar views on AAS use. As shown by a participant with notable personal reservations about AAS use who stated:

> I have a few different thoughts on [AAS use]. The first is me as an individual, I am not for it. I … certainly don't want to take something that forces bodily change. The second, people do them and will continue to use them so. I would rather people do them under medical supervision to insure *[sic]* a bit of safety (despite no one ever overdosing on steroids). I think there is some value in use *[sic]* steroids pre/post surgeries to help with recovery.

Both participants highlight how service members who are motivated to use AAS are going to continue to do them. How service members constructed this view about AAS use impacted individual user motivations and behavior, as in how the AAS user would discourage AAS use among others but helped educate them if they did choose to use AAS. As well as how non-user viewed others using AAS in the Army, with the non-user

accepting the use of AAS in certain contexts despite being personally unwilling to use them. Therefore, as the policy barriers that might deter AAS are reduced, other social factors had a larger impact on user motivations.

Individual and institutional motivating factors may be influenced by something as basic as the *Army or unit physical performance demands* (M2a) placed on service members. While this subtheme was not typically expressed as a direct AAS use motivation, the high frequency of this theme in participant responses is noteworthy. Many participants made statements about the impact of physical performance on "mission success," as well as highlighting the need or expectation to be "big, strong and fast" in the Army. While it was not a primary motivator for most participants, it is a notable institutional construct that could also impact other unique military factors such as service members' experience with combat operations.

As noted in recent literature on AAS use in the military, there are occupational demands regarding the intensity of combat operations that are different from other career types (Peltier & Pettijohn, 2018, Scharre & Fish, 2018, Whyte et al., 2021b). Based on the *high intensity demands of combat operations* (M2d) some participants noted that weaker service members or units had put them in danger during combat missions or how AAS use was important to injury recovery and maintaining the high pace of combat mission frequency. One participant highlighted that he tried using AAS because as a medic he "started seeing the problems [he] would have trying to move/treat all these dudes that were unresasonable *[sic]* large." Another participant described the physical demands placed upon them and explained "we are all expected to perform to inhuman

standards...ensuring my physical capabilities on the battlefield at all times would definitely push my [AAS use].” Other respondents did highlight that despite the physical demands and serious nature of combat operations AAS were not a requirement and could at times be a detriment to a unit. Some participants noted that increased physical performance was only tied to certain situations experienced during a combat deployment or mission. So, while the demands of combat operations did motivate some participants’ AAS use, combat operations were not seen as a universal justification or motivation to use performance enhancing substances.

While the performance and combat demands experienced by many of the participants are important social factors, the impact of social constructs on AAS use motivations becomes clearer when examining the *common AAS usage among peers or leaders in a unit* (M2c). One response on this topic described how leaders “know it exists and generally agree with and understand it’s *[sic]* use, particularly in peer supervised situations.” Other responses commonly referenced how other service members helped supply and educate each other on safe practices for AAS use. As the usage of AAS was more openly accepted among some units, barriers to AAS use were further reduced.

In contrast to open and common usage, the *negative social views or stigma* (R2c) experienced by the participants did impact user behavior. In several participant narratives, the idea that their AAS use would be seen negatively by their peers did alter their use of AAS. One participant described his social experience with AAS use in this manner:

> While I was using them, it was amazing. I got stronger much faster then [*sic*] without them...The praise from my peers and leaders only fueled that motivation. Disclaimer: my peers and leadership did not know I was using. I was also afraid of ridicule for using because it would be seen as a cheat. Or at least that's how I felt it would be seen.

This participant noted that he eventually ceased using AAS, which may have been fueled by this social stigma. The stigma appeared to only drive him to hide his use of AAS rather than deterring his initial use. Other participants highlighted how negative stigma often created additional risk as service members who used AAS were driven to secrecy.

Regardless of if participants described conditions where AAS was more openly used or if they had to hide their use, the data demonstrated that perceptions regarding AAS use were often influenced by views on *reckless AAS use* (R2d). This theme was presented based on how individuals approached their AAS use and impacted if service members viewed others' use positively or negatively. Response about if people were "smart" or "dumb" about their usage, or if they were "overdoing it" or not "safe" about using AAS emphasized how participants constructed their acceptance of AAS use. These responses indicated that there was an acceptable way in which the participants felt AAS could be tolerated and positively applied toward meeting performance and combat demands.

The concept that there is a "safe" way to use AAS to increase physical performance was further represented by how participants described the risks associated with AAS. Negative risks such as "addiction," "ligament damage," "roid rage," and

unspecified “long-term effects” were discussed and did impact some participants’ behavior regarding AAS use. Respondents also highlighted views that suggested that the overall risk of AAS use was relatively low despite the potential risks noted. Participants emphasized that these risks were even lower with education, medical oversite, and even by limiting use to older service members.

Themes related to knowledge (K1, K2) were also important factors in how participants constructed their views on AAS use. AAS users indicated higher levels of knowledge about AAS versus what was reported by participants with no history of AAS use. While the narratives were not descriptive enough to determine if their reported knowledge levels were consistent with literature on AAS effects, they were suggestive of significant effort by many participants to research and understand their potential effects and effectiveness. It is also worth noting that none of the participants described having significant *experience with AAS treatment or training* (K2b) in the Army. Though some noted that the Army’s substance abuse programs were predominantly focused on more commonly abused substances.

Finally, the participants’ *feedback and recommendations for Army AAS policy* (P2) highlighted important social constructs that impact AAS use motivations among service members. Participants with or without a history of AAS use indicated high levels of acceptance toward the use of AAS use in a military capacity under the right conditions. Not all participants suggested that service members should use AAS, but a major theme presented in the feedback was that education and medical oversite should be made available to those who do. The ideas presented under this theme were often connected to

the earlier discussion regarding how service members would continue to use AAS because of a lack of policy enforcement and common usage in certain communities. While it was also emphasized that changes to current policies and programs were unlikely, many participants expressed how AAS could be more safely and effectively used by service members with certain medical and educational measures in place.

Summary

The narratives collected in this study did not generally highlight specific or direct connections between how Army policy impacted user motivations. The social constructs experienced by the participants indicated that variations in unit enforcement of policy, unit acceptance, and risk decisions about the balance between positive and negative effects were influenced by Army policy. The responses in this study indicated a potential lack of deterrence regarding service members who are motivated to use AAS despite prohibitive policies and potential health risks. Social factors were able to have a greater apparent impact on user behavior due to the limited influence that Army policy had on many of the service members in this study.

The results of this study indicate that Army policy often had a limited impact on the motivations of service members who have a history of AAS use. Army policy did impact user experiences but varied based on AAS usage among peers and leader enforcement efforts across different units. Army policy can also impact user motivations for those who considered the career risks associated with potential punitive actions; however, user experiences often illustrated conditions that indicated they felt there was a low probability of detection regarding their AAS use. Coupled with these policy impacts,

the social views about physical performance, mission success, and AAS use had a greater impact on the motivations of service members who used AAS.

The policy and social impacts on AAS user motivations found in this study highlight how social constructs experienced by service members can significantly influence behavior related to AAS use. While some respondents indicated that Army policy influenced their decision to avoid or cease AAS use, the inconsistent enforcement of Army policy was a significant factor regarding those who chose to use AAS despite potential career or health risks. Coupled with largely positive social views, the perception of low negative health impacts, unit acceptance, and fitness motivators described by these service members, the lack of impact by Army policy on AAS user behavior raises questions about the effectiveness of current policies. I will examine the results of this study further in Chapter 5 by describing my interpretations of these findings and a comparison of what has been found in current literature on this topic. Chapter 5 will also include a discussion on the limitations, my recommendations, and potential implications of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Understanding the impact of U.S. Army policy and social factors on the motivations of AAS using service members is essential to addressing the potential growth of AAS substance use among service members. The purpose of this qualitative study was to improve the understanding of the motivations of service members who use performance enhancing AAS and the impacts of the Army's substance abuse policies on those individuals. This study was conducted to better understand the social constructs that influence AAS user behavior in the Army so that the potential risks and benefits of AAS use could be better understood in the context of military service. Without addressing the degree to which policy and social constructs impact AAS user motivations, the risks to individual health and unit mission readiness in the Army will remain poorly understood.

While further study of this topic is needed, the results of this study suggest that the limited enforcement of Army policy and lack of regular AAS drug testing reduce the deterrent policy effects that could alter user behavior and how service members consider the risks associated with AAS use. The low probability of detection, despite the high potential severity of punishment, significantly reduces the career risks experienced by service members. Low career risks, coupled with perceptions of low AAS health risks, impact overall user motivations associated with the physical performance enhancements received from AAS use. In some cases, the limited enforcement of policy resulted in environments where AAS was commonly used, tolerated, or even supported by peers, medical providers, and leaders.

In this chapter, I will provide my interpretations of the results that were discussed in Chapter 4, as well as the limitations of this study. I will also discuss my recommendations for addressing some of the policy challenges highlighted in the responses collected and recommendations for future research efforts. After my recommendations are presented, I will describe the potential social implications of this study before offering concluding thoughts on my findings.

Interpretation of the Findings

The scope of this study was focused on the policy and social impacts concerning user motivations, as experienced by service members with and without a history of AAS use during their service. To address the focus and purpose of this study, I organized my interpretations to target four critical areas. First, the most prominent topic is the barriers and inconsistencies in policy enforcement and the common usage or acceptance of AAS among service members. Second, I address how service members described their experiences related to making tradeoffs between risk and performance enhancements when considering their motivations to use AAS. Third, I focus on the absence of user experience with substance abuse treatment and the need to explore harm-reduction strategies. Finally, I describe how social construction and policy design theory relate to key findings presented in the individual experiences collected in this study. These critical areas help focus on the social constructs and policy impacts on individual user motivations and support the examination of possible intervention and policy strategies that can reduce health and mission risks associated with AAS use in the Army.

Barriers to Policy Enforcement and Peer AAS Usage

As with any strictly prohibitive anti-doping policy, effectiveness relies on active measures that regularly deter or identify those who are using banned or illicit substances. Henning and Dimeo (2018) and Kayser and Møller (2019) highlighted how anti-doping policies rely on effective testing measures to impact AAS use; however, as is well articulated by the participants of this study and as outlined in Army policy (DA, 2020b) the Army does not regularly test for AAS. McBride et al. (2018) highlighted how the growth of designer drugs that are undetectable to AAS testing are becoming more common. Many of the participants of this study highlighted how the lack of testing made the risk of detection very low. Service members do not have to worry about getting designer drugs if the Army doesn't test for AAS as part of their regular drug testing programs.

The reduced effectiveness of Army policy, due to a lack of regular AAS testing, is further compounded by the reduced impact of leader involvement or commitment to implementing Army policy. Atkinson et al. (2021) noted leaders' involvement as a key factor regarding the effectiveness of anti-doping policies. While the participants of this study did discuss that some leaders would address illicit AAS use, the preponderance of comments highlighted how unit leaders "understand its use," would "turn a blind eye," or "don't care" about AAS use. Some leaders may have just found "it very hard to test for steroids" or "difficult to regulate," even if they had been inclined to or needed to test for AAS use in their unit. Army policy can have a deterrent effect, even without the use of

regular drug testing; however, concerted unit and leader efforts are required to overcome the legal and policy barriers that inhibit regular AAS drug testing.

These barriers to policy enforcement do not suggest that there is not a broader deterrent effect that may be impacting larger Army populations and their potential AAS use. Large Army-wide assessments would be needed to research the extent to which Army policy does deter AAS use. While one participant noted that he stopped using AAS due to the increased career risk as he advanced in rank, most participants conveyed a sentiment that was represented by a "don't get caught" attitude toward Army policy, with others highlighting how they do not use AAS but themselves or others likely would if not for the current policy. The deterrent effect of Army policy is present, but the extent to which it is limiting AAS use could not be determined in this study.

Bates and Backhouses' (2020) conclusion that strict anti-doping policies do not work well if organizations are not well monitored is especially relevant to how the Army implements and restricts its AAS testing. Unit leaders that are unable or unwilling to overcome the policy barriers required to obtain special AAS tests further reduce the effectiveness of the Army's AAS prevention efforts. Because policy implementation is limited, many participants described regular AAS usage or acceptance among their peers and leaders.

Without significant career risk from punitive Army policies AAS use can become more commonly accepted and used by service members. As highlighted by Coakley (2020), many communities are growing more accepting of performance enhancements, which is echoed in the sentiments captured by this study. Participants excessed ideas such

as "[AAS use] is quite popular," or that all special operations service members "should be on hormone therapy." Despite the noted acceptance of AAS, its use was often based on certain conditions such as "if regulated by medical professionals, I see no issues if done willing," or AAS use would be ok "in moderation and controlled." One participant even stated the others he "served with are the entire reason [he] used." Under the right conditions, many of the participants held views that accepted and tolerated AAS use when safely used.

The limitations of the Army's policy implementation and testing of AAS lead to environments among units that are more open to AAS use among its members. Leaders either ignore or even condone the use of AAS under certain conditions. Coupled with generally positive social views on the acceptance of AAS use, participants suggest a willingness to accept their use in the Army. Certainly, some participants still discourage AAS use or described the need to hide their AAS use, but the lack of deterrence because of policy effectiveness allows other motivations to support user decisions to use AAS. So, while Army policy mirrors anti-doping policies found in sports communities, it does not have the level of monitoring and testing needed to be more effective.

Risk and Enhancement Tradeoffs

As implementation structures within Army policy limit the likelihood of punitive actions related to AAS use, service members are likely to place greater weight on other individual or social motivating factors. When considering the potential health risks, participants did not often indicate that this was a major concern. One participant described the risk of AAS in this manner, "I don't see them as being any greater than the

common mental and physical stressors placed upon you in special forces." Coakley (2020) highlighted a similar perspective among elite athletes, who felt that their level of training did more harm to their bodies than AAS use. Another respondent described his AAS use by stating, "They have helped me greatly. Even understanding the potential negative side effects of use, I don't regret using them." The risks of their use were acknowledged, and participants did not suggest that AAS use was risk free; however, through moderation, research, and experience, participants indicated that health risks could be reduced.

With the perception of low health or career risks, positive motivating factors could become more prominent for AAS users. One participant described his initial motivation to use AAS because he perceived that, "[he] was weak compared to [his] peers. [He] looked for anything to help [him] become stronger." Other participants often reference peer competition and the need to be a high performer; however, many described common benefits that are consistent with other common performance enchantment related motivations related to AAS use, which are described in Chapter 2. Regardless of how participants justified AAS use motivations because of Army requirements, their individual motivations often overcame the potential risks they perceived. The participants did not discount the risks completely, but their initial individual or Army-related motivations outweighed the perceived risk based on their decision to use AAS at some point in their service.

Many of the participants indicated that they had limited their use of AAS over time or only used it for a single cycle. While these participants did not typically expound

on the decision to cease AAS use, some did note that the benefits many have not been significant enough to take maintain their use. One participant noted, “I have done a lot of my own personal research to see if it would be useful to use again, but the risks don’t seem worth it to me.” Others also described that they found they could achieve sufficient fitness levels without AAS and through proper nutrition and fitness routines. User risk tradeoff decisions can shift over time and may not always align with a decision to continue to use AAS. The principal factor, however, is that those who choose to use AAS do so because they see that the potential benefits outweigh the risks, and cessation decisions appear to also be based on individual risk-benefits tradeoffs.

The experiences described by the participants with a history of AAS use are consistent with common perspectives conveyed among other AAS using communities. AAS users see themselves as having a good understanding of the health impacts of AAS, and they make risk decisions that are motivated by enhancements benefits that are assessed to be greater than negative health risks (Ainsworth et al., 2022; Coakley, 2020; Gilmore et al., 2020). Service members who use AAS demonstrate that they have made similar risk decisions. They may have motivations that are connected to more impactful situations such as combat, but their initial decisions to use generally occur irrespective of potential policy impacts. Because the health risks are not clearly understood, due to the challenges described in Chapter 2, user motivations can be validated when service members perceive that they are gaining the desired performance benefits with limited health or career risks.

Harm-reduction Strategies

Once the decision to use AAS had been made, the participants of this study suggested that more should be done to focus on harm-reduction strategies or address limitations with current policy. One participant highlighted that his greatest concern about service members using AAS was based on "improper use because of ignorance and having to hide it from command," and that current Army policy is "absurd, backwards, and prohibitive." The idea that service members were at risk because of a lack of education or treatment was exhibited across multiple responses and is a consistent view with how many AAS policies focus on prohibition rather than protecting individual health (Atkinson et al., 2021; Bates & Backhouse, 2020; Henning & Dimeo, 2018). When recommendations and policy feedback were provided by participants, they focused on how greater medical oversight and education were needed to reduce the risks associated with AAS.

Based on the presumption that AAS users have already made a deliberate risk tradeoff decision to use AAS, user driven feedback should be incorporated into harm-reductio efforts to reduce risk (Harvey et al., 2019; Harvey et al., 2020; Henning & Andreasson, 2022; McVeigh, 2019). As highlighted by some participants there are unclear barriers to implementing harm-reduction treatment or policy, with one response noting, "I don't know how to do it exactly, but there should be a mechanism to administer and educate soldiers who are going to do them regardless," and another stating, "any education would be better than the status quo." The suggestion that risk reduction strategies would be more effective among those who choose to do AAS despite

prohibitive policies is also highlighted in current literature (Harvey et al., 2019; McVeigh, 2019). As Army policy has little focus on educating or treating those who use AAS, recommendations to do more than maintain the status quo should drive further policy review.

An additional issue raised in the participants' narratives was related to how a culture of secrecy may further inhibit a user's access to treatment or harm-reduction interventions. While the participants did not cite these issues directly, they did describe an environment that hid AAS use or relied on "peer supervised" or peer supplied AAS treatment. These environments are comparable among other communities where secrecy and stigmatization may reduce the use of health care for fear of exposure and increase individual's contact with other illicit activities (Ainsworth et al., 2022; Atkinson et al., 2021; Collins, 2019; Henning et al., 2021; Hope et al., 2020). Service members who use AAS may be unlikely to seek substance abuse treatment and be at further criminalization risk as well. Further research is needed to examine potential connections between participants who lack experience with AAS treatment, potential fear of putative action, or exposure to illicit activities due to their AAS use.

While there are limitations to how the Army might approach various strategies for reducing risk for those who use AAS, this study highlights important feedback regarding the need for education and medical oversight or treatment. Based on the lack of education or treatment experience described by the participants, the Army's substance abuse programs and policies are exhibiting the same lack of focus on user health that is described in other AAS-using communities. The current policy takes an all or nothing

approach without accounting for sub-populations within the Army that are motivated to use AAS despite the potential risks. It appears that little effort is being made to address these limitations outside of internal peer-to-peer guidance among AAS users in the Army.

Social Construction and Policy Design

This study identified questions about the deterrent effect of Army policy, and it is apparent from the findings that there are significant challenges to the effective enforcement of Army policy among some units. This issue highlights institutional challenges with policy design elements such as the goals, tools, and implementation structures of this policy (Schneider & Ingram, 2008). In this case, Army policy goals aimed at preventing AAS use are undermined by limiting the use of random drug testing, which is the primary deterrence tool (DA, 2020b). Implementation structures of this policy also require that units establish probable cause (DA, 2020b) while preventing unit-wide testing for AAS (DoD, 2020). Based on these design elements, it is easy to see why participant experiences are represented by this participant's statement: "the Army doesn't really test for it. Just don't get caught with stuff. I was tested on a regular basis like everyone else and never had a positive. Just don't roid out and get crazy and stupid."

These policy design issues that create a "don't get caught" mentality are also related to a primary proposition of social constructions theory. As noted by Schneider and Ingram (2008) the impact of policy on future behaviors is one of the main elements of this theory. In this case, a policy impact on Army leader behavior is highlighted by one participant who described reactive behavior when he stated that AAS use wasn't punished "unless your command is already trying to get you for something else." Or in

the case of another leader that stated, “I found it very hard to test for [AAS].” Policy barriers influenced user behavior by altering how unit leaders respond to the issue of AAS. This limitation with the policy, then contributed to AAS using service member behavior as substance use was perceived to have a low probability of detection. Additionally, as with other AAS policies like this, the punitive power of the Army may be driving user behavior related to their willingness to access treatment or medical care.

As highlighted by Schneider and Ingram (2008) policies with limited effectiveness can be perpetuated because of the social and policy constructs experienced by a population. The goal of Army policy is a policy design element that is centered on deterring the use of AAS among service members, but other design elements such as inconsistent AAS testing tools, and implementation structures related to how those tests are obtained undermine this policy goal. Further research may find that Army policy is having a broader deterrent effect that is achieving the desired overall goals of the Army; however, the participants in this study indicated that associated policy design flaws were resulting in limited policy impact on those who were motivated to use AAS despite the risks.

Limitations of the Study

The primary limitation to this study was the lack of generalization that this study provides toward understanding a broader Army population. This limitation was due to the small sample size used to focus on the narrative experiences of the participants. While this approach provided deeper individual insights, the sample size did not account for each of the different AAS user types that potentially exist within the Army or provide a

large enough sample to make broad statements about AAS users in the Army population. The exploratory nature of this narrative approach may lay the groundwork for further study, but it does not portray whether these findings are more universal among the Army regarding the user motivations and policy impacts raised in this study.

The narrative focus also did not account for how the service's substance abuse policy has impacted service member motivations across the force when considering its effectiveness at deterring AAS use. As this study focused on individuals who have elected to use AAS despite Army policy, this study could not develop a broader understanding of how service members may be deterred from using AAS due to current Army policy. While some participants indicated that Army policy had a deterring effect, these ideas typically came from service members without a history of AAS use. The findings associated with the non-using participants also do not provide generalized views of service members about predominant feelings and views on AAS use within the Army. Additional research is needed to determine the impact current policy does have on deterring service members who may otherwise be inclined to use AAS.

An additional limitation was also present due to the use of a survey instrument for data collection. This limitation was necessary to protect participants' privacy and minimize potential career risks, due to my current role as an active-duty officer. While this study was able to explore important perspectives that have been poorly examined, the inability to ask follow-up questions or seek clarification on survey entries limited my ability to fully develop how participants have constructed their experiences relative to Army policies and other social factors impacting their AAS use motivations. Atkinson et

al. (2021) highlighted the limitations of surveys to address complex AAS factors but still found them useful in developing understanding of this topic. Likewise, the surveys collected in this study helped explore AAS use among service members. Additional research aimed at understanding Army-wide views on AAS use in the service is needed to examine prevailing social views and policy impacts on this topic.

The use of narrative surveys may have also contributed to lower response rates and partially completed surveys as text entries on personal phones may have contributed to incomplete responses. For example, eight additional surveys were initiated with participants providing consent and completing demographic and AAS use history information, but upon reaching the text-based portions these respondents chose to exit the study. These participants may have continued if the survey remained multiple choice throughout. The initial incomplete responses and concerns that a lower sample size would create additional limitations related to participant variety, service member and veteran differences, and leadership bias did not ultimately impact data saturation required for this study.

Recruiting efforts produced participants from a variety of ranks, units, occupational specialties, and installations which ensured that bias due to localized unit conditions was not experienced. Additional limitation concerns regarding the benefit of participants from non-ideal target populations such as veterans or non-infantry based occupational specialties were also not present. Despite the inclusion of a small number of these non-ideal participants, the responses from these individuals were consistent with the ideal target population. Finally, limitations that may have been present due to a small

sample of non-AAS using service members were not demonstrated in the responses. Recruitment of an ideal sample size of participants without a history of AAS use also presented a variety of perspectives and experiences without indicating an undue bias toward the administration of Army policies.

Recommendations

The need for additional research on the topic is present in several areas. From this study, two major themes were highlighted that provide a basis for continued research on AAS use among U.S. Service members, specifically members of the U.S. Army. Current literature examined in Chapter 2 also demonstrated ongoing gaps in knowledge regarding AAS use rates in the U.S. military, health impacts, and medical trust issues that were not addressed in this study. The first recommendation arising from this study is related to the extent to which Army policy is deterring the use of AAS among service members. Several non-using participants indicated positive views about the benefits of AAS while indicating that themselves or others would likely use AAS if authorized, and some respondents who used AAS indicated they had ceased using due to careers risks associated with Army policy; however, a predominant theme present suggested that in many Army communities the deterrent effect of Army policy is absent. Further research should focus on determining broader policy impacts on factors that influence the decision *not* to use AAS in the Army. This type of research could overcome some of the limitations of this study as it would not rely on service members discussing illicit activities. The second recommendation is to target veteran-only populations to gain greater insight into the barriers service members experience regarding access to AAS

related treatment and education. This research aimed at AAS users in the Army is needed to examine the lack of experience with treatment options indicated in this study. By targeting veteran populations, the risk associated with negative career implications could be reduced and allow for deeper narrative analysis. Focus should be made to develop greater user driven feedback for developing harm-reduction interventions and treatment strategies.

Implications

The lack of attention on the enduring AAS substance abuse problem in the U.S. military places vulnerable service members at increased risk of negative physical and mental health effects. Coupled with the absence of treatment support described by this study's participants, the potential long-term impacts of AAS use on service members appear to be unchecked by Army medical providers. Issues related to drug abuse, homelessness, and suicide are other ongoing issues impacting service members, and the lack of medical treatment for AAS use, could further impact those issues.

Without receiving adequate levels of medical care or access to treatment programs this problem will likely continue to negatively impact service members who are using AAS to improve their physical and mission performance. Recent literature on AAS use rates, long-term health impacts, medical mistrust, motivational issues, and policy impacts has demonstrated limited understanding of how to develop harm-reduction strategies for AAS using service members. While this study was not aimed at determining accurate AAS health impacts, medical mistrust issues, or prevalence rates, it does reduce gaps in knowledge on user motivations and policy impacts.

This study demonstrates that a deeper examination of Army policies is needed to incorporate AAS user feedback into harm-reduction strategies and treatment options for service members with a history of AAS use. As found in this study, participants described a lack of treatment, limited medical care, and how AAS knowledge was derived primarily from non-medical peer sources. While these findings did not identify any preventative implications, this study does highlight user-feedback which could be incorporated into efforts to improve safety and treatment options for service members with a history of AAS use.

This study also has academic implications by improving the level of understanding of AAS use among service members. By developing a greater understanding of this issue, research on this topic can be brought into better alignment with research on broader AAS-using populations. This study also has implications regarding the effectiveness of the anti-doping policies currently being used in the Army. As highlighted in Chapter 2 strict anti-doping policies are often found to be less effective at reducing AAS use (Collins, 2019; Goldman et al., 2019; Henning et al., 2021). Understanding individual user motivations and policy impacts experienced by the participants in this study suggest the same challenges with the service's anti-doping policies. Participants' feedback suggests that the harm-reduction efforts described in current literature may have greater positive impacts than what is currently being experienced by service members (Ainsworth et al., 2022; Bonnecaze et al., 2020; Harvey et al., 2019; Harvey et al., 2020; Hope et al., 2020).

The continuation of strict anti-doping policies may also have potential implications for impacting positive social change efforts regarding the negative social stigma associated with AAS use. Ainsworth et al. (2022) and Hope et al. (2020) highlighted how stigma may contribute to AAS users receiving ineffective medical care. While this study could not identify specific barriers to the participants receiving medical or treatment care, it does suggest that participants were concerned about the lack of treatment. The power imbalance between the service members and the Army places service members at a disadvantage when seeking appropriate treatment without incurring significant legal and career risks. Exploring means to reduce stigma and promote treatment related to AAS use should be pursued to further protect vulnerable user populations.

Finally, some limited methodological and theoretical implications can be highlighted from this study. From a methodological perspective, the need to use anonymous surveys for data collection due to my current active-duty status significantly limited the depth of understanding this study could achieve. The limitations of using a survey instrument as described earlier prevented this study from fully exploring the connections that the participants made in the construction of their views and experience with AAS use. Future studies on this topic should consider veteran participants or researchers without the professional reporting obligations associated with discussing misconduct with service members. This has implications for reducing risk to research study participants while producing a greater understanding of the topic.

Conclusions

Through this study, I examined unique policy and social constructs that have impacted the motivations and experiences of U.S. Army service members who use AAS for performance enhancing purposes. The purpose of this study was about improving understanding of the motivations of service members and how the service's substance abuse policies impacted those individuals. Social constructions related to how Army policy is enforced, how AAS use is tolerated by other service members, and how AAS users balance risk-reward tradeoff decisions have a significant influence on the motivations and policy impacts experienced by service members. Most notably, themes present in the data suggest that the absence of policy enforcement by unit leaders creates an environment where other individual and social motivating factors outweigh the deterring impact of Army policy. As service members construct views that are based on low career and health risk versus positive social and performance benefits, their individual behavior related to AAS use is changed. AAS use becomes more likely as perceived health and career risks are reduced. Additionally, this study shows exploratory themes related to positive social views on AAS use within the context of military service, and feedback promoting greater levels of AAS treatment and education in the Army.

These results relied on a social construction framework to examine how policy design elements influenced Army policy impacts and how service members constructed their motivations based on policy and social factors. Due to policy implementation structures that create barriers limiting the effectiveness of AAS testing tools, this study indicated that Army leaders were either unable or unwilling to enforce Army policy in a

manner that would more effectively deter AAS use. Service members with and without a history of AAS use suggested those with the motivation to use AAS in the military were likely to continue to do so, as the policy impacts or health risks were determined to be limited. More research is needed to determine whether Army policy is adequately deterring AAS use across a broader Army population. In addition to the barriers associated with the effective implementation of Army policy, service members also highlighted shortcomings related to treatment and education options available to AAS using service members. Greater research in this area is also needed to explore suitable harm-reduction strategies and examine barriers that may have impacted low participant experience with AAS treatments in the Army. Without better understanding the effectiveness of Army policy or potential treatment strategies service members are likely to continue to place themselves and the Army at risk.

References

Ainsworth, N. P., Thrower, S. N., & Petróczi, A. (2022). Two sides of the same coin: A qualitative exploration of experiential and perceptual factors which influence the clinical interaction between physicians and anabolic-androgenic steroid using patients in the UK. *Emerging Trends in Drugs, Addictions, and Health*, *2*, 100033. https://doi.org/10.1016/j.etdah.2022.100033

Ainsworth, N. P., Vargo, E. J., & Petróczi, A. (2018). Being in control? A thematic content analysis of 14 in-depth interviews with 2,4-dinitrophenol users. *International Journal of Drug Policy*, *52*, 106–114. https://doi.org/10.1016/j.drugpo.2017.12.012

Albano, G. D., Amico, F., Cocimano, G., Liberto, A., Maglietta, F., Esposito, M., Rosi, G. L., Di Nunno, N., Salerno, M., & Montana, A. (2021). Adverse effects of anabolic-androgenic steroids: A literature review. *Healthcare*, *9*(1), 97. https://doi.org/10.3390/healthcare9010097

Alharbi, F. F., Gamaleddin, I., Alharbi, S. F., Almodayfer, O., Allohidan, F., Alghobain, M., Arafah, A., & Al-Surimi, K. (2019). Knowledge, attitudes and use of anabolic-androgenic steroids among male gym users: A community based survey in Riyadh, Saudi Arabia. *Saudi Pharmaceutical Journal*, *27*(2), 254–263. https://doi.org/10.1016/j.jsps.2018.11.007

Allafi, A., Almansour, F., & Alreshoud, A. (2019). The use of anabolic hormones by Kuwaiti males. *Science & Sports*, *34*(1), 40–44. https://doi.org/10.1016/j.scispo.2018.08.003

Allenby, B. (2018). Designer warriors: Altering conflict—and humanity itself? *Bulletin of the Atomic Scientists*, *74*(6), 379–384. https://doi.org/10.1080/00963402.2018.1533194

AlShareef, S., Gokarakonda, S. B., & Marwaha, R. (2022). Anabolic steroid use disorder. In *StatPearls*. StatPearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK538174/

Althobiti, S., Alqurashi, N., Alotaibi, A., Alharthi, T., & Alswat, K. (2018). Prevalence, attitude, knowledge, and practice of anabolic androgenic steroid (AAS) use among gym participants. *Materia Socio Medica*, *30*(1), 49. https://doi.org/10.5455/msm.2018.30.49-52

Anawalt, B. D. (2018). Detection of anabolic androgenic steroid use by elite athletes and by members of the general public. *Molecular and Cellular Endocrinology*, *464*, 21–27. https://doi.org/10.1016/j.mce.2017.09.027

Anawalt, B. D. (2019). Diagnosis and management of anabolic androgenic steroid use. *The Journal of Clinical Endocrinology & Metabolism*, *104*(7), 2490–2500. https://doi.org/10.1210/jc.2018-01882

Anderson, R. (2018). People first, mission always—Super soldiers and the future of human performance enhancement. In K. Nossal, S. Von Hlatky, & W. G. Braun (Eds.), *Developing the super soldier: Enhancing military performance* (pp. 115–122). Army War College (U.S.). Strategic Studies Institute.

Anderson, R. P., Jimenez, G., Bae, J. Y., Silver, D., Macinko, J., & Porfiri, M. (2016). Understanding policy diffusion in the U.S.: An information-theoretical approach

to unveil connectivity structures in slowly evolving complex systems. *SIAM Journal on Applied Dynamical Systems*, *15*(3), 1384–1409. https://doi.org/10.1137/15M1041584

Andreasson, J., & Henning, A. (2019). Glocal fitness doping: Policy, practice and prevention in the United States and Sweden. *Performance Enhancement & Health*, *6*(3–4), 103–110. https://doi.org/10.1016/j.peh.2018.11.001

Andrews, M. A., Magee, C. D., Combest, T. M., Allard, R. J., & Douglas, K. M. (2018). Physical effects of anabolic-androgenic steroids in healthy exercising adults: A systematic review and meta-analysis. *Current Sports Medicine Reports*, *17*(7), 232–241. https://doi.org/10.1249/JSR.0000000000000500

Armed Force, 10 U.S. Code § 101 (2022). https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title10-section101&num=0&edition=prelim.

Army Public Health Center. (2020). Anabolic Steroids. https://phc.amedd.army.mil/topics/healthyliving/asm/Pages/SteroidAbuse.aspx

Army Substance Abuse Program. (2022). Alcohol & Drug Guide: Steroids. https://sr2.army.mil/PROD_PUBLIC/public/facts/facts-steroids.jsp

Atkinson, A. M., van de Ven, K., Cunningham, M., de Zeeuw, T., Hibbert, E., Forlini, C., Barkoukis, V., & Sumnall, H. R. (2021). Performance and image enhancing drug interventions aimed at increasing knowledge among healthcare professionals (HCP): Reflections on the implementation of the Dopinglinkki e-module in Europe and Australia in the HCP workforce. *International Journal of Drug*

Policy, *95*, 103141. https://doi.org/10.1016/j.drugpo.2021.103141

Austin, K. G., McLellan, T. M., Farina, E. K., McGraw, S. M., & Lieberman, H. R. (2016). Soldier use of dietary supplements, including protein and body building supplements, in a combat zone is different than use in garrison. *Applied Physiology, Nutrition, and Metabolism*, *41*(1), 88–95. https://doi.org/10.1139/apnm-2015-0387

Barale, F., Gillet, M., Camelot, G., Prieur, C., Boillot, A., & Monciardini, M. (1975). [Medico-surgical evaluation of 71 reoperations in abdominal surgery]. *Annales De L'anesthesiologie Francaise*, *16*(4), 311–316.

Bates, G., & Backhouse, S. (2020). Preventing image and performance enhancing drug use:it's not all chalk and talk. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 280–296). Routledge.

Bates, G., Begley, E., Tod, D., Jones, L., Leavey, C., & McVeigh, J. (2019a). A systematic review investigating the behaviour change strategies in interventions to prevent misuse of anabolic steroids. *Journal of Health Psychology*, *24*(11), 1595–1612. https://doi.org/10.1177/1359105317737607

Bates, G., Shepherd, S., & McVeigh, J. (2021). Harm reduction strategies for androgen users: Providing appropriate support and improving engagement with healthcare. *Current Opinion in Endocrinology, Diabetes & Obesity*, *28*(6), 630–635. https://doi.org/10.1097/MED.0000000000000676

Bates, G., Tod, D., Leavey, C., & McVeigh, J. (2019b). An evidence-based socioecological framework to understand men's use of anabolic androgenic

steroids and inform interventions in this area. *Drugs: Education, Prevention and Policy*, *26*(6), 484–492. https://doi.org/10.1080/09687637.2018.1488947

Bates, G., Van Hout, M.-C., Teck, J. T. W., & McVeigh, J. (2019c). Treatments for people who use anabolic androgenic steroids: A scoping review. *Harm Reduction Journal*, *16*(1), 75. https://doi.org/10.1186/s12954-019-0343-1

Beard, M., Galliott, J., & Lynch, S. (2016). Soldier enhancement: Ethical risks and opportunities. *Australian Army Journal*, *13*(1), 5–20.

Berger, P. L., & Luckmann, T. (1990). *The social construction of reality: A treatise in the sociology of knowledge*. Anchor Books.

Bickford, A. (2019). "Kill-proofing" the soldier: Environmental threats, anticipation, and US military biomedical armor programs. *Current Anthropology*, *60*(S19), S39–S48. https://doi.org/10.1086/700028

Bickford, A. (2020). *Chemical heroes: Pharmacological supersoldiers in the US Military*. Duke University Press.

Bland, R. D., Clarke, T. L., & Harden, L. B. (1976). Rapid infusion of sodium bicarbonate and albumin into high-risk premature infants soon after birth: A controlled, prospective trial. *American Journal of Obstetrics and Gynecology*, *124*(3), 263–267. https://doi.org/10.1016/0002-9378(76)90154-x

Boardley, I. (2020). Licit forms of performance enhancement and possible links with IPED use: Current knowledge and future directions. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 68–82). Routledge.

Boardley, I. D., Grix, J., & Dewar, A. J. (2014). Moral disengagement and associated processes in performance-enhancing drug use: A national qualitative investigation. *Journal of Sports Sciences*, *32*(9), 836–844. https://doi.org/10.1080/02640414.2013.862842

Bonnecaze, A. K., O'Connor, T., & Aloi, J. A. (2020). Characteristics and attitudes of men using anabolic androgenic steroids (AAS): A Survey of 2385 Men. *American Journal of Men's Health*, *14*(6), 155798832096653. https://doi.org/10.1177/1557988320966536

Bonnecaze, A. K., O'Connor, T., & Burns, C. A. (2021). Harm reduction in male patients actively using anabolic androgenic ateroids (AAS) and performance-enhancing drugs (PEDs): A Review. *Journal of General Internal Medicine*, *36*(7), 2055–2064. https://doi.org/10.1007/s11606-021-06751-3

Breede, H. C. (2018). Capability and Connection: Social Cohesion and Soldier Performance Enhancement in Canada and the United States. In K. Nossal, S. Von Hlatky, & W. G. Braun (Eds.), *Developing the super soldier: Enhancing military performance* (pp. 7–28). Army War College (U.S.). Strategic Studies Institute.

Brennan, R., Wells, J., & Van Hout, M. (2019). "Beauty through the eye of a needle": An online study off the practices and beliefs of people who inject performance and image enhancing drugs (PIEDs). In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 128–154). Routledge.

Bucher, J. (2012). Soldiering with substance: substance and steroid use among military personnel. *Journal of Drug Education*, *42*(3), 267–292.

https://doi.org/10.2190/DE.42.3.b

Caron, J.-F. (2018). *A theory of the super soldier: The morality of capacity-increasing technologies in the military*. Manchester University Press. https://www.jstor.org/stable/j.ctv18b5pmz

Chatwin, C., Blackman, S., & O'Brien, K. L. (2018). Intersections in (new) drug research. *Drugs: Education, Prevention and Policy*, *25*(4), 297–300. https://doi.org/10.1080/09687637.2018.1466867

Chegeni, R., Pallesen, S., McVeigh, J., & Sagoe, D. (2021). Anabolic-androgenic steroid administration increases self-reported aggression in healthy males: A systematic review and meta-analysis of experimental studies. *Psychopharmacology*, *238*(7), 1911–1922. https://doi.org/10.1007/s00213-021-05818-7

Christiansen, A. V. (2020). *Gym Culture, Identity and Performance-Enhancing Drugs: Tracing a Typology of Steroid Use* (1st ed.). Routledge. https://doi.org/10.4324/9781003018438

Christiansen, A. V., Vinther, A. S., & Liokaftos, D. (2017). Outline of a typology of men's use of anabolic androgenic steroids in fitness and strength training environments*. *Drugs: Education, Prevention and Policy*, *24*(3), 295–305. https://doi.org/10.1080/09687637.2016.1231173

Coakley, J. (2020). The social construction of human enhancement: Implications for sports. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 40–53). Routledge.

Cohen, P. A., Travis, J. C., Keizers, P. H. J., Deuster, P., & Venhuis, B. J. (2018). Four

experimental stimulants found in sports and weight loss supplements: 2-amino-6-methylheptane (octodrine), 1,4-dimethylamylamine (1,4-DMAA), 1,3-dimethylamylamine (1,3-DMAA) and 1,3-dimethylbutylamine (1,3-DMBA). *Clinical Toxicology*, *56*(6), 421–426. https://doi.org/10.1080/15563650.2017.1398328

Coker-Cranney, A., Watson, J. C., Bernstein, M., Voelker, D. K., & Coakley, J. (2018). How far is too far? Understanding identity and over conformity in collegiate wrestlers. *Qualitative Research in Sport, Exercise and Health*, *10*(1), 92–116. https://doi.org/10.1080/2159676X.2017.1372798

Collins, R. (2019). The war on anabolic-androgenic steroids: An examination of U.S. legislative and enforcement efforts. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 264–279). Routledge.

Coomber, R., & Salinas, M. (2020). The supply of image and performance enhancing drugs (IPED) to local non-elite users in England. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 231–246). Routledge.

Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. Los Angeles, CA: Sage Publications, Inc.

Department of the Army. (2020a). *Army Strategic and Operational Readiness: AR 525-30*. Department of the Army. https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN15118_AR525_30_FINAL.pdf

Department of the Army. (2020b). *The Army Substance Abuse Program: AR 600-85*. Department of the Army. https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN30190-AR_600-85-001-WEB-3.pdf

Department of Defense. (2014). *Department of Defense Instruction No. 1010.04: Problematic Substance Use by DoD Personnel*. U.S. Department of Defense.

Department of Defense. (2018). *Department of Defense Instruction No. 1010.01: Military Personnel Drug Abuse Testing Program (MPDATP)*. U.S. Department of Defense.

Department of Defense. (2020). *Department of Defense Instruction No. 1010.16: Technical procedures for the military personnel drug abuse testing program*. U.S. Department of Defense.

Department of Veterans Affairs. (2019). *Verification Assistance Brief*. https://www.va.gov/OSDBU/docs/Determining-Veteran-Status.pdf

Department of Veterans Affairs. (2021). *I am an Active Duty service member*. Office of Public and Intergovernmental Affairs. https://www.va.gov/opa/persona/active_duty.asp

Drug Abuse Prevention and Control, 21 U.S.C. 13, (2012). https://www.govinfo.gov/content/pkg/USCODE-2012-title21/pdf/USCODE-2012-title21-chap13.pdf

Emanuel, P., Walper, S., DiEuliis, D., Klein, N., Petro, J., & Giordano, J. (2019). *Cyborg Soldier 2050: Human/Machine Fusion and the Implications for the Future of the*

DoD (Technical Report CCDC CBC-TR-1599; p. 42). U.S. Army Combat Capabilities Development Command. https://apps.dtic.mil/sti/citations/AD1083010

Esin, C., Fathi, M., & Squire, C. (2014). *The SAGE Handbook of Qualitative Data Analysis* (U. Flick, Ed.). SAGE Publications, Inc. https://doi.org/10.4135/9781446282243

Fabresse, N., Gheddar, L., Kintz, P., Knapp, A., Larabi, I. A., & Alvarez, J.-C. (2021). Analysis of pharmaceutical products and dietary supplements seized from the black market among bodybuilders. *Forensic Science International*, *322*, 110771. https://doi.org/10.1016/j.forsciint.2021.110771

Faulkner, S. L., & Trotter, S. P. (2017). Data Saturation. In J. Matthes, C. S. Davis, & R. F. Potter (Eds.), *The International Encyclopedia of Communication Research Methods* (1st ed., pp. 1–2). Wiley. https://doi.org/10.1002/9781118901731.iecrm0060

Franey, D. G., & Espiridion, E. D. (2018). Anabolic Steroid-induced Mania. *Cureus*. https://doi.org/10.7759/cureus.3163

Friedl, K. E. (2015). U.S. Army research on pharmacological enhancement of soldier performance: Stimulants, anabolic hormones, and blood doping. *Journal of Strength and Conditioning Research*, *29*(Supplement 11), S71–S76. https://doi.org/10.1519/JSC.0000000000001027

Gadela, N. V., Coban, H., Wasserman, E., Schreyer, E., & Jaiswal, A. (2021). The tragedy of a strong muscle and a weak heart: complications of anabolic-

androgenic steroid misuse. *Cureus*. https://doi.org/10.7759/cureus.17389

Gilmore, H., Shannon, S., Leavey, G., Dempster, M., Gallagher, S., & Breslin, G. (2020). Help-seeking beliefs among anabolic androgenic steroid users experiencing side effects: An interpretive phenomenological analysis. *Journal of Clinical Sport Psychology*, *14*(4), 359–375. https://doi.org/10.1123/jcsp.2019-0028

Girling, K., Thorpe, J., & Auger, A. (2017). *A Framework to Assess the Military Ethics of Human Enhancement Technologies* [Scientific Letter]. Defence Research and Development Canada. https://publications.gc.ca/collections/collection_2017/rddc-drdc/D68-1-167-2017-eng.pdf

Givens, M. L., Deuster, P. A., & Kupchak, B. R. (2016). CHAMP symposium on androgens, anabolic steroids, and related substances: What we know and what we need to know. *Military Medicine*, *181*(7), 680–686. https://doi.org/10.7205/MILMED-D-15-00537

Goldman, A. L., Pope, H. G., & Bhasin, S. (2019). The health threat posed by the hidden epidemic of anabolic steroid use and body image disorders among young men. *The Journal of Clinical Endocrinology & Metabolism*, *104*(4), 1069–1074. https://doi.org/10.1210/jc.2018-01706

Goodley, H. (2020). *Pharmacological Performance Enhancement and the Military*. The Royal Institute of International Affairs Chatham House. https://www.chathamhouse.org/2020/11/pharmacological-performance-enhancement-and-military/07-consent-enhance

Greenway, C. W., & Price, C. (2018). A qualitative study of the motivations for anabolic-

androgenic steroid use: The role of muscle dysmorphia and self-esteem in long-term users. *Performance Enhancement & Health*, *6*(1), 12–20. https://doi.org/10.1016/j.peh.2018.02.002

Grier, T., Anderson, M. K., Depenbrock, P., Eiserman, R., Nindl, B. C., & Jones, B. H. (2018). Evaluation of the US army special forces tactical human optimization, rapid rehabilitation, and reconditioning program. *Journal of Special Operations Medicine : A Peer Reviewed Journal for SOF Medical Professionals*, *18*(2), 42–48.

Hall, A., & Antonopooulos, G. (2020). The (online) supply of illicit lifestyle medicines: A criminological study. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 173–187). Routledge.

Handelsman, D. J. (2021). Androgen Misuse and Abuse. *Endocrine Reviews*, *42*(4), 457–501. https://doi.org/10.1210/endrev/bnab001

Hanley Santos, G., & Coomber, R. (2017). The risk environment of anabolic-androgenic steroid users in the UK: Examining motivations, practices and accounts of use. *The International Journal on Drug Policy*, *40*, 35–43. https://doi.org/10.1016/j.drugpo.2016.11.005

Harris, M. A., Dunn, M., & Alwyn, T. (2016). A qualitative exploration of the motivations underlying anabolic-androgenic steroid use from adolescence into adulthood. *Health Psychology Report*, *4*, 315–320. https://doi.org/10.5114/hpr.2016.61669

Hart, N. H., & Newton, R. U. (2019). Testosterone replacement for male military

personnel – A potential countermeasure to reduce injury and improve performance under extreme conditions. *EBioMedicine*, *47*, 16–17. https://doi.org/10.1016/j.ebiom.2019.08.015

Harvey, O., Keen, S., Parrish, M., & van Teijlingen, E. (2019). Support for people who use anabolic androgenic steroids: A systematic scoping review into what they want and what they access. *BMC Public Health*, *19*(1), 1024. https://doi.org/10.1186/s12889-019-7288-x

Harvey, O., Parrish, M., van Teijlingen, E., & Trenoweth, S. (2020). Support for non-prescribed anabolic androgenic steroids users: A qualitative exploration of their needs. *Drugs: Education, Prevention and Policy*, *27*(5), 377–386. https://doi.org/10.1080/09687637.2019.1705763

Harvey, O., Parrish, M., van Teijlingen, E., & Trenoweth, S. (2022). Libido as a motivator for starting and restarting non-prescribed anabolic androgenic steroid use among men: A mixed-methods study. *Drugs: Education, Prevention and Policy*, *29*(3), 276–288. https://doi.org/10.1080/09687637.2021.1882940

Hauger, L. E., Havnes, I. A., Jørstad, M. L., & Bjørnebekk, A. (2021). Anabolic androgenic steroids, antisocial personality traits, aggression and violence. *Drug and Alcohol Dependence*, *221*, 108604. https://doi.org/10.1016/j.drugalcdep.2021.108604

Hearne, E., Wazaify, M., Van Hout, M. C., Atkinson, A., & McVeigh, J. (2021). Anabolic-androgenic steroid use in the eastern Mediterranean region: a scoping review of extant empirical literature. *International Journal of Mental Health and*

Addiction, *19*(4), 1162–1189. https://doi.org/10.1007/s11469-019-00217-8

Henning, A., & Andreasson, J. (2022). Preventing, producing, or reducing harm? Fitness doping risk and enabling environments. *Drugs: Education, Prevention and Policy*, *29*(1), 95–104. https://doi.org/10.1080/09687637.2020.1865273

Henning, A. D., & Dimeo, P. (2018). The new front in the war on doping: Amateur athletes. *International Journal of Drug Policy*, *51*, 128–136. https://doi.org/10.1016/j.drugpo.2017.05.036

Henning, A., McLean, K., Andreasson, J., & Dimeo, P. (2021). Risk and enabling environments in sport: Systematic doping as harm reduction. *International Journal of Drug Policy*, *91*, 102897. https://doi.org/10.1016/j.drugpo.2020.102897

Henry, P. (2015). Rigor in qualitative research: Promoting quality in social science research. *Research Journal of Recent Sciences*, *4*, 25–28.

Holstein, J. A., & Gubrium, J. F. (Eds.). (2008). *Handbook of constructionist research*. Guilford Press.

Hope, V., Leavy, C., Morgan, G., Acreman, D., Turner, D., & Smith, J. (2020). *Facilitators and barriers to health care access amongst people using image and performance enhancing drugs in Wales: Findings & Outcomes Report*. Public Health Wales.

House of Representatives, Congress. (2015). 50 U.S.C. 3911 - Definitions. [Government]. U.S. Government Publishing Office. https://www.govinfo.gov/app/details/USCODE-2015-title50/USCODE-2015-

title50-chap50-subchapI-sec3911

Howell, A. (2017). Neuroscience and war: Human enhancement, soldier rehabilitation, and the ethical limits of dual-use frameworks. *Millennium: Journal of International Studies*, *45*(2), 133–150. https://doi.org/10.1177/0305829816672930

Hussain, B., Khalily, M. T., & Khalily, M. A. (2022). Suicidal tendencies and psychiatric symptoms as consequence of anabolic androgenic steroid usage among athletes in District Rawalpindi. *Journal of the Pakistan Medical Association*, *72*(4), 616–619. https://doi.org/10.47391/JPMA.791

Hussain, B., Khalily, M. T., Rehman, A. U., Masud, M., & Arouj, K. (2019). Prevalence of anabolic androgenic steroids usage among Pakistani athletes and its psychological/legal consequences. *The Shield-Research Journal of Physical Education & Sports Science.*, *13*.

Hutchinson, B., Moston, S., & Engelberg, T. (2018). Social validation: A motivational theory of doping in an online bodybuilding community. *Sport in Society*, *21*(2), 260–282. https://doi.org/10.1080/17430437.2015.1096245

Ingram, H., Schneider, A. L., & DeLeon, P. (2007). Social construction and policy design. In P. A. Sabatier (Ed.), Theories of the Policy Process (pp. 223-260).

Institute of Medicine. (2008). *Use of Dietary Supplements by Military Personnel*. National Academies Press. https://doi.org/10.17226/12095

Jones, B. D. (2003). Bounded rationality and political science: Lessons from public administration and public policy. *Journal of Public Administration Research and*

Theory, *13*(4), 395–412. https://doi.org/10.1093/jopart/mug028

Kanayama, G., Hudson, J. I., & Pope, Jr., H. G. (2020). Anabolic-androgenic steroid use and body image in men: A growing concern for clinicians. *Psychotherapy and Psychosomatics*, *89*(2), 65–73. https://doi.org/10.1159/000505978

Kanayama, G., Kaufman, M. J., & Pope, H. G. (2018). Public health impact of androgens: *Current Opinion in Endocrinology & Diabetes and Obesity*, *25*(3), 218–223. https://doi.org/10.1097/MED.0000000000000404

Kanayama, G., & Pope, H. G. (2018). History and epidemiology of anabolic androgens in athletes and non-athletes. *Molecular and Cellular Endocrinology*, *464*, 4–13. https://doi.org/10.1016/j.mce.2017.02.039

Kanayama, G., Pope, H. G., & Hudson, J. I. (2018). Associations of anabolic-androgenic steroid use with other behavioral disorders: An analysis using directed acyclic graphs. *Psychological Medicine*, *48*(15), 2601–2608. https://doi.org/10.1017/S0033291718000508

Kayser, B., & Møller, V. (2019). The anti-doping industry coming of age: In search of new markets. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 27–39). Routledge.

Kegel, J. L., Kazman, J. B., Scott, J. M., & Deuster, P. A. (2020). Health behaviors and psychosocial attributes of US soldiers. *Journal of the Academy of Nutrition and Dietetics*, *120*(9), 1469–1483. https://doi.org/10.1016/j.jand.2020.01.018

Kelly, T. K., Masi, R., Walker, B., Knapp, S., & Leuschner, K. J. (2013). An assessment of the Army's tactical human optimization, rapid rehabilitation and reconditioning

program. *Rand Health Quarterly*, *3*(2), 8.

Kim, J. H. (2016). *Understanding Narrative Inquiry: The Crafting and Analysis of Stories as Research*. SAGE Publications, Inc. https://doi.org/10.4135/9781071802861

Knapik, J. J., Trone, D. W., Steelman, R. A., Farina, E. K., & Lieberman, H. R. (2021). Prevalence of and factors associated with dietary supplement use in a stratified, random sample of us military personnel: The US military dietary supplement use study. *The Journal of Nutrition*, *151*(11), 3495–3506. https://doi.org/10.1093/jn/nxab239

Koenraadt, R. (2020). Trust, risk and deceit in the illicit medicines market. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 204–217). Routledge.

Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, *24*(1), 120–124. https://doi.org/10.1080/13814788.2017.1375092

Larsen, E., Clausen, S., & Stahlman, S. (2019). Testosterone replacement therapy use among active component service men, 2017. *MSMR*, *26*(3), 26–31.

Latheef, S., & Henschke, A. (2020). Can a soldier say no to an enhancing intervention? *Philosophies*, *5*(3), 13. https://doi.org/10.3390/philosophies5030013

Liivoja, R. (2018). Biomedical enhancement of warfighters and the legal protection of military medical personnel in armed conflict. *Medical Law Review*, *26*(3), 421–448. https://doi.org/10.1093/medlaw/fwx046

Magee, C. D., Witte, S., Kwok, R. M., & Deuster, P. A. (2016). Mission compromised? Drug-induced liver injury from prohormone supplements containing anabolic–androgenic steroids in two deployed U.S. service members. *Military Medicine*, *181*(9), e1169–e1171. https://doi.org/10.7205/MILMED-D-15-00502

Mallinson, D. J. (2021). Policy innovation adoption across the diffusion life course. *Policy Studies Journal*, *49*(2), 335–358. https://doi.org/10.1111/psj.12406

McBride, J. A., Carson, C. C., & Coward, R. M. (2018). The availability and acquisition of illicit anabolic androgenic steroids and testosterone preparations on the internet. *American Journal of Men's Health*, *12*(5), 1352–1357. https://doi.org/10.1177/1557988316648704

McVeigh, J. (2019). Engaging with people who use image and performance enhancing drugs: one size does not fit all. *International Journal of Drug Policy*, *71*, 1–2. https://doi.org/10.1016/j.drugpo.2019.05.016

McVeigh, J., & Begley, E. (2017). Anabolic steroids in the UK: An increasing issue for public health. *Drugs: Education, Prevention and Policy*, *24*(3), 278–285. https://doi.org/10.1080/09687637.2016.1245713

McVeigh, J., Hearne, E., Boardley, I., Bates, G., Hope, V., Ralphs, R., & Van Hout, M. C. (2021). Generating evidence on the use of Image and performance enhancing drugs in the UK: Results from a scoping review and expert consultation by the Anabolic Steroid UK network. *Harm Reduction Journal*, *18*(1), 107. https://doi.org/10.1186/s12954-021-00550-z

Meadows, S. O., Engel, C. C., Collins, R. L., Beckman, R. L., Breslau, J., Bloom, E. L.,

Dunbar, M. S., Gilbert, M., Grant, D., Hawes-Dawson, J., Holliday, S. B., MacCarthy, S., Pedersen, E. R., Robbins, M. W., Rose, A. J., Ryan, J., Schell, T. L., & Simmons, M. M. (2021). *2018 Department of Defense Health Related Behaviors Survey (HRBS): Results for the Active Component*. RAND Corporation. https://doi.org/10.7249/RR4222

Mehlman, M. (2019). Bioethics of military performance enhancement. *Journal of the Royal Army Medical Corps*, *165*(4), 226–231. https://doi.org/10.1136/jramc-2018-001130

Mehlman, M. J., Lin, P., & Abney, K. (2013). Enhanced warfighters: A policy framework. *Military Medical Ethics for the 21st Century*, 113–126.

Mehlman, M., Lin, P., & Abney, K. (2013). Enhanced warfighters: risk, ethics, and policy. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2202982

Metz, S. (2016). How far can the U.S. Military go to building a technology-enhanced "super soldier"? *World Politics Review (Selective Content)*, 1–3. Academic Search Complete.

Middlebrook, I., & Schoener, B. (2022). Anabolic Steroid Toxicity. In *StatPearls*. StatPearls Publishing. http://www.ncbi.nlm.nih.gov/books/NBK544259/

Mills, C. Wright., Gerth, Hans Heinrich,. (1970). *From Max Weber: Essays in sociology*. Routledge and Paul Kegan; /z-wcorg/.

Moore, E., & Morrison, J. (2022). In defense of medically supervised doping. *Journal of the Philosophy of Sport*, 1–18. https://doi.org/10.1080/00948705.2022.2066538

Mullen, C., Whalley, B. J., Schifano, F., & Baker, J. S. (2020). Anabolic androgenic

steroid abuse in the United Kingdom: An update. *British Journal of Pharmacology*, *177*(10), 2180–2198. https://doi.org/10.1111/bph.14995

Mulrooney, K. J. D., van de Ven, K., McVeigh, J., & Collins, R. (2019). Steroid madness- has the dark side of anabolic-androgenic steroids (AAS) been over-stated? *Performance Enhancement & Health*, *6*(3–4), 98–102. https://doi.org/10.1016/j.peh.2019.03.001

Nagata, J. M., Ganson, K. T., Gorrell, S., Mitchison, D., & Murray, S. B. (2020). Association between legal performance-enhancing substances and use of anabolic-androgenic steroids in young adults. *JAMA Pediatrics*, *174*(10), 992. https://doi.org/10.1001/jamapediatrics.2020.0883

Nagata, J. M., Ganson, K. T., Griffiths, S., Mitchison, D., Garber, A. K., Vittinghoff, E., Bibbins-Domingo, K., & Murray, S. B. (2022a). Prevalence and correlates of muscle-enhancing behaviors among adolescents and young adults in the United States. *International Journal of Adolescent Medicine and Health*, *34*(2), 119–129. https://doi.org/10.1515/ijamh-2020-0001

Nagata, J. M., Hazzard, V. M., Ganson, K. T., Austin, S. B., Neumark-Sztainer, D., & Eisenberg, M. E. (2022b). Muscle-building behaviors from adolescence to emerging adulthood: A prospective cohort study. *Preventive Medicine Reports*, *27*, 101778. https://doi.org/10.1016/j.pmedr.2022.101778

National Institute on Drug Abuse. (2018a). *Anabolic Steroids Drug Facts* [Research Report]. National Institute on Drug Abuse. https://nida.nih.gov/publications/drugfacts/anabolic-steroids

National Institute on Drug Abuse. (2018b). *Steroids and Other Appearance and Performance Enhancing Drugs (APEDs) Research Report* [Research Report]. National Institute on Drug Abuse. https://nida.nih.gov/publications/research-reports/steroids-other-appearance-performance-enhancing-drugs-apeds

National Institute on Drug Abuse. (2021). *Words Matter: Preferred Language for Talking About Addiction* [Research Report]. National Institute on Drug Abuse. https://nida.nih.gov/research-topics/addiction-science/words-matter-preferred-language-talking-about-addiction

Nelson, B. S., Hildebrandt, T., & Wallisch, P. (2022). Anabolic–androgenic steroid use is associated with psychopathy, risk-taking, anger, and physical problems. *Scientific Reports*, *12*(1), 9133. https://doi.org/10.1038/s41598-022-13048-w

Nutt, D. J. (2020). *Drugs without the hot air: Making sense of legal and illegal drugs* (Second edition). UIT Cambridge.

Nossal, K., Von Hlatky, S., & Braun, W. G. (Eds.). (2018). *Developing the super soldier: Enhancing military performance*. Army War College (U.S.). Strategic Studies Institute.

Ordway, S., Sadowski, B., Driggers, K. E., & Kwok, R. (2021). Severe drug-induced liver injury in the military: A retrospective review. *Military Medicine*, usab445. https://doi.org/10.1093/milmed/usab445

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice (4th Ed). Thousand Oaks, CA: Sage Publications, Inc.

Paisley, R. D. (2015). Nutritional and sports supplement use among deployed U.S. Army

soldiers in a remote, austere combat outpost in eastern Afghanistan. *Military Medicine*, *180*(4), 391–401. https://doi.org/10.7205/MILMED-D-14-00334

Peltier, C., & Pettijohn, K. (2018). The future of steroids for performance enhancement in the U.S. Military. *Military Medicine*, *183*(7–8), 151–153. https://doi.org/10.1093/milmed/usy093

Pereira, E., Moyses, S. J., Ignácio, S. A., Mendes, D. K., Silva, D. S. D. A., Carneiro, E., Hardy, A. M. T. G., Rosa, E. A. R., Bettega, P. V. C., & Johann, A. C. B. R. (2019). Prevalence and profile of users and non-users of anabolic steroids among resistance training practitioners. *BMC Public Health*, *19*(1), 1650. https://doi.org/10.1186/s12889-019-8004-6

Pfaff, C. A. (2018). Moral Autonomy and the Ethics of Soldier Enhancement. In K. Nossal, S. Von Hlatky, & W. G. Braun (Eds.), *Developing the super soldier: Enhancing military performance* (pp. 65–80). Army War College (U.S.). Strategic Studies Institute.

Piacentino, D., Sani, G., Kotzalidis, G. D., Cappelletti, S., Longo, L., Rizzato, S., Fabi, F., Frati, P., Fineschi, V., & Leggio, L. (2022). Anabolic androgenic steroids used as performance and image enhancing drugs in professional and amateur athletes: Toxicological and psychopathological findings. *Human Psychopharmacology: Clinical and Experimental*, *37*(1). https://doi.org/10.1002/hup.2815

Picano, J. (2018). Soldier Resilience: Lessons Learned from the Assessment and Selection of High-Risk Military Operational Personnel. In K. Nossal, S. Von Hlatky, & W. G. Braun (Eds.), *Developing the super soldier: Enhancing military*

performance (pp. 47–64). Army War College (U.S.). Strategic Studies Institute.

Pierce, J. J., Siddiki, S., Jones, M. D., Schumacher, K., Pattison, A., & Peterson, H. (2014). Social construction and policy design: a review of past applications: social construction and policy design. *Policy Studies Journal*, *42*(1), 1–29. https://doi.org/10.1111/psj.12040

Pope, H. G., Kanayama, G., Athey, A., Ryan, E., Hudson, J. I., & Baggish, A. (2014). The lifetime prevalence of anabolic-androgenic steroid use and dependence in Americans: Current best estimates: Prevalence of Anabolic-Androgenic Steroid Use. *The American Journal on Addictions*, *23*(4), 371–377. https://doi.org/10.1111/j.1521-0391.2013.12118.x

Pope, H. G., Kanayama, G., Hudson, J. I., & Kaufman, M. J. (2021). Review article: Anabolic-androgenic steroids, violence, and crime: Two cases and literature Review. *The American Journal on Addictions*, *30*(5), 423–432. https://doi.org/10.1111/ajad.13157

Reddit (n.d.-a) *Natty or Juice*. https://www.reddit.com/r/nattyorjuice/

Reddit (n.d.-b) *Special Forces: Special Operations Forces*. https://www.reddit.com/r/specialforces/

Ribeiro, M. V. de M., Boralle, N., Felippe, L. G., Pezza, H. R., & Pezza, L. (2018). 1H NMR determination of adulteration of anabolic steroids in seized drugs. *Steroids*, *138*, 47–56. https://doi.org/10.1016/j.steroids.2018.07.002

Ricci, G. (2020). Pharmacological human enhancement: An overview of the looming bioethical and regulatory challenges. *Frontiers in Psychiatry*, *11*, 53.

https://doi.org/10.3389/fpsyt.2020.00053

Saati Asr, M. H., Bashirian, S., Heidari Moghadam, R., Barati, M., & Moeini, B. (2018). Personal and psychosocial factors associated with anabolic-androgenic steroid use among Iranian male bodybuilders. *Journal of Substance Use*, *23*(4), 390–395. https://doi.org/10.1080/14659891.2018.1436600

Sagoe, D., Molde, H., Andreassen, C. S., Torsheim, T., & Pallesen, S. (2014). The global epidemiology of anabolic-androgenic steroid use: A meta-analysis and meta-regression analysis. *Annals of Epidemiology*, *24*(5), 383–398. https://doi.org/10.1016/j.annepidem.2014.01.009

Sagoe, D., & Pallesen, S. (2018). Androgen abuse epidemiology: *Current Opinion in Endocrinology & Diabetes and Obesity*, *25*(3), 185–194. https://doi.org/10.1097/MED.0000000000000403

Saldana, J. (2013). The Coding Manual for Qualitative Researchers (2nd ed.). London: Sage.

Salinas, M., Floodgate, W., & Ralphs, R. (2019). Polydrug use and polydrug markets amongst image and performance enhancing drug users: Implications for harm reduction interventions and drug policy. *International Journal of Drug Policy*, *67*, 43–51. https://doi.org/10.1016/j.drugpo.2019.01.019

Scharre, P., & Fish, L. (2018). *Human Performance Enhancement*. Center for a New American Security; JSTOR. http://www.jstor.org/stable/resrep20411

Schneider, A., & Ingram, H. (2008). Social Constructions in the Study of Public Policy. In J. A. Holstein & J. F. Gubrium (Eds.), *Handbook of constructionist research*

(pp. 189–211). Guilford Press.

Searle, J. R. (2014). The Social Construction of Reality. In M. Shamiyeh (Ed.), *Driving Desired Futures* (pp. 56–67). DE GRUYTER. https://doi.org/10.1515/9783038212843.56

Selk-Ghaffari, M., Shab-Bidar, S., & Halabchi, F. (2021). The prevalence of anabolic-androgenic steroid misuse in Iranian athletes: A systematic review and meta-analysis. *Iranian Journal of Public Health*. https://doi.org/10.18502/ijph.v50i6.6411

Senate, Congress. (2021, April 14). H.R. 172 (RFS) - United States Anti-Doping Agency Reauthorization Act of 2021. [Government]. U.S. Government Publishing Office. https://www.govinfo.gov/app/details/BILLS-117hr172rfs

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information* 22(2), 63-75.

Shook, J. R., & Giordano, J. J. (2017). Moral bioenhancement for social welfare: are civic institutions ready? *Frontiers in Sociology*, *2*, 21. https://doi.org/10.3389/fsoc.2017.00021

Smith, S. M., Dart, R. C., Katz, N. P., Paillard, F., Adams, E. H., Comer, S. D., Degroot, A., Edwards, R. R., Haddox, D. J., Jaffe, J. H., Jones, C. M., Kleber, H. D., Kopecky, E. A., Markman, J. D., Montoya, I. D., O'Brien, C., Roland, C. L., Stanton, M., Strain, E. C., … Dworkin, R. H. (2013). Classification and definition of misuse, abuse, and related events in clinical trials: ACTTION systematic review and recommendations. *Pain*, *154*(11), 2287–2296.

https://doi.org/10.1016/j.pain.2013.05.053

Tay Wee Teck, J., & McCann, M. (2018). Tracking internet interest in anabolic-androgenic steroids using Google Trends. *International Journal of Drug Policy*, *51*, 52–55. https://doi.org/10.1016/j.drugpo.2017.11.001

Uddin, Z., Iqbal, Q., Haider, S., & Saleem, F. (2019). Usage and perceptions of anabolic-androgenic steroids among male gym attendees in Quetta city, Pakistan–a descriptive analysis. *Research in Pharmacy and Health Sciences*, *05*(02), 152–157. https://doi.org/10.32463/rphs.2019.v05i02.06

Underwood, M., van de Ven, K., & Dunn, M. (2021). Testing the boundaries: Self-medicated testosterone replacement and why it is practiced. *International Journal of Drug Policy*, *95*, 103087. https://doi.org/10.1016/j.drugpo.2020.103087

U.S. Drug Enforcement Administration. (2022). *Controlled Substances*. https://www.deadiversion.usdoj.gov/schedules/orangebook/c_cs_alpha.pdf

U.S. Food and Drug Administration. (2019). *Highlights of prescribing information: JATENZO*. https://www.accessdata.fda.gov/drugsatfda_docs/label/2019/206089s000lbl.pdf

van de Ven, K., Boardley, I., & Chandler, M. (2022). Identifying best-practice amongst health professionals who work with people using image and performance enhancing drugs (IPEDs) through participatory action research. *Qualitative Research in Sport, Exercise and Health*, *14*(2), 199–215. https://doi.org/10.1080/2159676X.2021.1898457

van de Ven, K., Dunn, M., & Mulrooney, K. (2020a). Performance and image enhancing

drug (PIED) producers and suppliers: A retrospective content analysis of PIED-provider cases in Australia from 2010-2016. *Trends in Organized Crime*, *23*(2), 143–153. https://doi.org/10.1007/s12117-018-9348-5

van de Ven, K., Mulrooney, K. J. D., & McVeigh, J. (Eds.). (2020b). *Human enhancement drugs*. Routledge.

van de Ven, K., Zahnow, R., McVeigh, J., & Winstock, A. (2020c). The modes of administration of anabolic-androgenic steroid (AAS) users: Are non-injecting people who use steroids overlooked? *Drugs: Education, Prevention and Policy*, *27*(2), 131–135. https://doi.org/10.1080/09687637.2019.1608910

Varanoske, A. N., Harris, M. N., Hebert, C., Howard, E. E., Johannsen, N. M., Heymsfield, S. B., Greenway, F. L., Margolis, L. M., Lieberman, H. R., Church, D. D., Ferrando, A. A., Rood, J. C., & Pasiakos, S. M. (2021). Effects of testosterone undecanoate on performance during multi-stressor military operations: A trial protocol for the Optimizing Performance for Soldiers II study. *Contemporary Clinical Trials Communications*, *23*, 100819. https://doi.org/10.1016/j.conctc.2021.100819

Varanoske, A. N., Harris, M. N., Hebert, C., Howard, E. E., Johannsen, N. M., Heymsfield, S. B., Greenway, F. L., Margolis, L. M., Lieberman, H. R., Beyl, R. A., Church, D. D., Ferrando, A. A., Pasiakos, S. M., & Rood, J. C. (2022). Testosterone undecanoate administration prevents declines in fat-free mass but not physical performance during simulated multi-stressor military operations. *Journal of Applied Physiology*, *133*(2), 426–442.

https://doi.org/10.1152/japplphysiol.00190.2022

Varney, S. M., Ng, P. C., Perez, C. A., Araña, A. A., Austin, E. R., Ramos, R. G., & Bebarta, V. S. (2017). Self-reported dietary supplement use in deployed United States service members pre-deployment vs. during deployment, Afghanistan, 2013–2014. *Military Medical Research*, *4*(1), 34. https://doi.org/10.1186/s40779-017-0141-6

Vinther, A., & Christiansen, A. (2020). Different users, different interventions: On the ideal topology of anabolic-androgenic steroid use and its implications for prevention, harm reduction and treatment. In K. Van de Ven, K. J. D. Mulrooney, & J. McVeigh (Eds.), *Human enhancement drugs* (pp. 249–263). Routledge.

Walker, J. (1969). The diffusion of innovations among the American states. *American Political Science Review*, *63*(3), 880–899.

War and National Defense, 50 U.S. Code § 3911 (2022) https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title50-section3911&num=0&edition=prelim

World Anti-Doping Agency. (2019). *World Anti-Doping Code 2015 with 2019 amendments*. World Anti-Doping Agency.

World Anti-Doping Agency. (2020). *The World Anti-Doping Code International Standard Prohibited List*. World Anti-Doping Agency.

World Anti-Doping Agency. (2021). *World Anti-Doping Code 2021*. World Anti-Doping Agency. https://www.wada-ama.org/sites/default/files/resources/files/2021_wada_code.pdf

Waugh, W. L., & Waugh, W. W. (2003). Phenomenology and public administration. *International Journal of Organization Theory & Behavior*, *7*(3), 405–431. https://doi.org/10.1108/IJOTB-07-03-2004-B006

Weber, M. (1970). *From Max Weber: Essays in sociology*. Routledge and Paul Kegan.

Whyte, I., Pattinson, E., Leyland, S., Soos, I., & Ling, J. (2021a). *Performance and image-enhancing drug use in military veterans. University of Sunderland.* (Forces in Mind Trust) [Project Report]. University of Sunderland. http://sure.sunderland.ac.uk/id/eprint/14056

Whyte, I., Pattinson, E., Leyland, S., Soos, I., & Ling, J. (2021b). Performance and image enhancing drugs use in active military personnel and veterans: A contemporary review. *Translational Sports Medicine*, *4*(1), 72–87. https://doi.org/10.1002/tsm2.186

Wigger, C., & Oelschlager, P. (2017). *The moral obligation to explore the military use of performance-enhancing supplements and drugs* [Master's Thesis, Naval Postgraduate School]. Dudly Knox Library, Thesis and Dissertation Collection. https://calhoun.nps.edu/handle/10945/55553

Yates, P. M. (2013). Before, during, and after: Identity and the social construction of knowledge in qualitative research Interviews. *Hydra-Interdisciplinary Journal of Social Sciences, 1(1), 31-41.* http://journals.ed.ac.uk/hydra/article/download/192/94/0

Zaami, S., Minutillo, A., Sirignano, A., & Marinelli, E. (2021). Effects of appearance- and performance-enhancing drugs on personality traits. *Frontiers in Psychiatry*,

12, 730167. https://doi.org/10.3389/fpsyt.2021.730167

Zahnow, R., McVeigh, J., Bates, G., Hope, V., Kean, J., Campbell, J., & Smith, J. (2018). Identifying a typology of men who use anabolic androgenic steroids (AAS). *International Journal of Drug Policy*, *55*, 105–112. https://doi.org/10.1016/j.drugpo.2018.02.022

Zahnow, R., McVeigh, J., Bates, G., & Winstock, A. R. (2020). Motives and correlates of anabolic-androgenic steroid use with stimulant polypharmacy. *Contemporary Drug Problems*, *47*(2), 118–135. https://doi.org/10.1177/0091450920919456

Zahnow, R., McVeigh, J., Ferris, J., & Winstock, A. (2017). Adverse effects, health service engagement, and service satisfaction among anabolic androgenic steroid users. *Contemporary Drug Problems*, *44*(1), 69–83. https://doi.org/10.1177/0091450917694268

Zanutto, A. (2013). Handbook of constructionist research. In *International Journal of Social Research Methodology* (Vol. 16, pp. 87–89). http://www.tandfonline.com/doi/abs/10.1080/13645579.2013.755374.

Appendix A: Survey Guide

You are invited to take part in a research study about the use of prohibited performance enhancing anabolic steroids by Army service members, their related motivations for steroid use, and their experience with Army substance abuse programs. The purpose of this study is to improve understanding of the motivations of Army service members who use performance enhancing anabolic steroids and the impacts of Army substance abuse policies on those individuals.

This study seeks 20-30 volunteers who are:
- Active duty Army service members **OR**
- Army Veterans who have served on active duty within the past 5 years.
- Have served in military occupational specialties within infantry, special forces, armor, field artillery, or military police.
- Have a history of anabolic steroid use while in the Army **OR**
- Have served in leadership positions with responsibility for implementing Army substance abuse policy.

Select "Next" to proceed

↓

Informed Consent Form

Select "Next" to consent and proceed

↓

Demographic Questions

1- Biological Sex: Male / Female
2- Rank Category: Officer / Warrant / Enlisted
3- Army Branch: Special Forces / Infantry / Field Artillery / Armor / Military Police
4- Service Status: Active Duty / Reserve / National Guard / Veteran
   a. IF Reserve / National Guard / Veteran Selected were you on active duty in the last 5 years?
      IF "No" is selected route to **disqualification page**
5- Current Years in Army Service: Text Entry
6- Region of current or most recent Army duty station: Northeast / South / Midwest / West / Pacific / Europe / Other

Select "Next" to proceed

↓

Prohibited Steroid Use

Which statement best describes you?

1- I have a history of prohibited steroid use while in the Army.
    a. IF "1" is selected route to **AAS user survey**.
2- I do NOT have a history of prohibited steroid use while in the Army.
    a. Which statement best describes you?
        i. I have served in leadership positions with responsibility for implementing Army substance abuse policies.
        ii. I have NOT served in leadership positions with responsibility for implementing Army substance abuse policies.
            1. IF "i" is selected route to **administrator survey**.
            2. IF "ii" is selected route to **disqualification page**

AAS User Survey

Please answer the following questions as descriptively as possible in the respective comment boxes below. While comments will remain completely anonymous do NOT include any identifying information such as names, units, or locations when describing your experiences.

1. Tell me about how the physical demands placed upon you in the Army have influenced your views on improving your physical performance?
2. What has been your experience with how physical performance in the Army has related to mission achievement or mission success?
3. How would you describe the physical fitness culture or pressures you have experienced in your unit and the Army?
4. How would you compare physical performance requirements in the Army with other careers that rely on high levels of fitness?
5. How do you feel about the use of performance enhancing substance in sports or other fitness communities?
6. Tell me about how you feel Soldiers and leaders you have served with in the Army have viewed performance enhancing substances such as anabolic steroids?
7. Could you describe what first motivated you to use anabolic steroids and what motivates you to continue their use?
8. How has your experience in the Army influenced those motivations?
9. Could you tell me how effective or critical you feel steroids have been in achieving your physical performance goals?
10. How would you describe your knowledge about the potential mental and physical effects of steroid use?

11. Could you tell me how you feel about the potential risks associated with steroid use and how that influences your use?
12. How would you explain Army policy on steroid use to someone considering the use of steroids?
13. Could you describe any experience you have had with Army substance abuse treatment or educational material related to steroid use?
14. Could you tell me about any recommendations you have about Army policy or substance abuse programs and educational material related to steroid use?

Select "Next" to complete Survey

↓

Non-AAS User Survey

1. Tell me about how the physical demands placed upon you in the Army have influenced your views on improving your physical performance?
2. What has been your experience with how physical performance in the Army has related to mission achievement or mission success?
3. How would you describe the physical fitness culture or pressures you have experienced in your unit and the Army?
4. How would you compare physical performance requirements in the Army with other careers that rely on high levels of fitness?
5. How do you feel about the use of performance enhancing substance in sports or other fitness communities?
6. Tell me about how the people and leaders you have served with in the Army have viewed performance enhancing substances such as anabolic steroids?
7. Could you describe what you feel would motivate Soldiers to first use anabolic steroids and what would motivate their continued use?
8. How do you feel Army culture might influence those motivations?
9. If possible, could you describe your assessment of the effectiveness of anabolic steroid helping Soldiers achieve their physical performance goals?
10. How would you describe your knowledge about the potential mental and physical effects of steroid use?
11. Could you tell me how you feel about the potential risks associated with steroid use by Soldiers?
12. What would describe as your greatest concern about Soldiers using steroids?
13. How would you explain Army policy on steroid use to someone unfamiliar with Army policy and programs?
14. Could you describe any experience you have had with administering Army substance abuse policies through testing, treatment, or educational material related to steroid use?
15. Could you tell me about any recommendations you have about Army policy, substance abuse programs, or educational material related to steroid use?

Select "Next" to complete Survey

Appendix B: Recruitment Flyer

Volunteers Needed for Research Study Surveys on Anabolic Steroid Use in the U.S. Army.

Do you have a history of anabolic steroid use or have experience managing Army substance abuse programs? There is a new study about the experiences of Soldiers with a history of Anabolic Steroid use that could help researchers better understand the motivations driving steroid use in the Army and the effectiveness of substance abuse programs. For this study, you are invited to describe your experiences with anabolic steroid use and Army substance abuse programs.

You May Qualify If You

- Are 18 or older
- Are Army service member
- **OR** veteran
- Have a history of anabolic steroid use while in the Army
- **OR** have managed Army Substance Abuse Programs
- Have served in one of the following Army branches (SF, IN, AR, FA, MP)

Participation Involves

- Conduct an anonymous online survey (10-20 min duration)

Survey Link

[redacted]

Confidentiality / Privacy Information

Participation is fully **anonymous**. IP addresses will not be collected. Identifying information is not required and will not be included in the research material.

Substance Misuse Assistance

Army service members needing assistance with Steroid substance misuse should contact their local ASAP center or see Army Substance Abuse Program (ASAP) :: U.S. Army Installation Management Command

FOR MORE INFORMATION

Please contact [redacted]

Scott Jackson is a doctoral student conducting research in support of his PhD in Public Policy and Administration with Walden University. He has served in the Army since 2004, but this study is separate from that role.