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## Normal developmental vulnerabilities of 17-24 year olds confounding informed consent to enlist in the military

Deanna L. Seather-Brady  
*Smith College*

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Deanna Seather-Brady  
Normal Developmental  
Vulnerabilities of 17-24 Year Olds  
Confounding Informed Consent to  
Enlist in the Military For Combat

## **ABSTRACT**

Researchers have identified the youngest soldiers (17-24 years old) in the United States military as particularly vulnerable to the emotional and physical consequences of war, including death. This theoretical thesis examines the capacity of 17-24 year old males to conceptualize consequences fully -- i.e., make informed consent decisions -- about enlisting for combat. The focus on 17-24 year old males is due to their much higher involvement in military combat than female enlisted. Much current thinking does not question 17-24 year old males' capacity for informed consent, but recent neurological and developmental research documents that brain functions underlying decision-making are underdeveloped until at least age 25. This thesis reviews the current psychosocial and related neurophysiological research re: typical development of 17-24 year olds, emphasizing developmental vulnerabilities that impact decision-making and thus informed consent. Additionally, ethical and moral responsibilities of professional social workers, individuals, and the collective society are reviewed -- specifically, to educate others about the typical developmental vulnerabilities of 17-24 year old males; to advocate for a delay in sending them into combat until at least age 25, and to intervene in the healing of young returning veterans -- currently overrepresented among those injured in combat.

NORMAL DEVELOPMENTAL VULNERABILITIES OF 17-24 YEAR OLDS  
CONFOUNDING INFORMED CONSENT TO ENLIST IN THE MILITARY FOR COMBAT

A project based upon an independent investigation,  
submitted in partial fulfillment of the requirements  
for the degree of Master of Social Work.

Deanna Seather-Brady

Smith College School for Social Work  
Northampton, Massachusetts 01063

2012

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## **CHAPTER I**

### **Introduction**

The impetus for this thesis originated partly from my thinking, over the past year or more, about social work ethics and young adult development. While becoming educated in graduate school about the critical importance of beneficence, justice, and respect for those who participate in research, I was also learning about recent research findings that the prefrontal cortex of adolescent and young adult brains are not fully developed until age 25. “But, wait,” I thought, “the prefrontal cortex is heavily involved in making decisions -- anticipating consequences, evaluating risks and benefits -- in other words, in precisely those cognitive functions that are required to give informed consent.” How could it be that young military enlistees can be making informed consent decisions if the very brain structures and functions needed for such decisions are lacking?

These questions did more than unsettle me: our youngest soldiers, 17-24 years old, are particularly vulnerable to the emotional and physical consequences of war, including death (Dohrenwend, Turner, Turse, Lewis-Fernandez & Yager, 2008; Institute of Medicine, 2010; Phillips, LeardMann, Gumbs & Smith, 2010; Preston & Buzzell, 2006; Seal, Bertenthal, Miner, Sen & Marmar, 2007). My questions multiplied further. I began to ask what other areas of developmental theory and research might shed light on the essential ethical dilemma just posed. Another question: if recent neurobiological research suggests a reduced capacity for those under 25 years old to understand the nature of an enlistment in terms of its probable impact, what is the

social work profession's responsibility? That particular question is more pressing given the reality that the 17-24 year age group, especially males, are among the most likely to enlist.

The focus of this thesis thus grew out of those questions and ethical discomforts. What is the capacity of 17-24 year old males to fully conceptualize consequences, i.e., make informed consent decisions, regarding enlisting for combat duty in the armed forces? What does examining this phenomenon of youthful enlistment through the lenses of other theories and realities offer? In particular, what do other cognitive and psychosocial theories tell us about development, and what understanding can be gained by considering the realistic outcomes of military enlistment in contemporary circumstances, involving two lengthy wars and repeated deployments?

Lacking from existing knowledge about 17-24 year old males enlisting for combat duty is the linking of neurological and developmental research to questions of decision-making. This theoretical thesis will thoroughly examine current psychosocial and related neurophysiological research, providing an overview of the typical development of 17-24 year old individuals, emphasizing developmental vulnerabilities that impact decision-making (Dahl, 2003; Giedd, 1999, 2008; Gogtay et al., 2004; Johnson, Blum & Giedd, 2009; Winter, 2004).

The findings of psychosocial and neurophysiological researchers have relevance for professional clinical social workers in that they are at the forefront of treating returning combat veterans in United States Veterans Administration hospitals and clinics, as well as private practices. Neurophysiological researchers have called attention to the underdeveloped executive functions for 17-24 year old males, and researchers analyzing the consequences of war to veterans have identified higher rates of Posttraumatic Stress Disorder, suicide, and combat related deaths in our youngest soldiers compared to older troops experiencing combat



(Dohrenwend et al., 2008; Institute of Medicine, 2010; Phillips et al., 2010; Seal et al., 2007).

Therefore, social workers have a responsibility, if other evidence also shows that 17-24 year olds are a vulnerable population incapable of fully informed decision making, to be proactive in maintaining adherence to ethical principles of informed consent. This would be particularly crucial when advising late adolescents and young adults contemplating enlistment. Social workers who provide treatment to returning veterans may also need to educate policy makers and offer advocacy regarding the needs of this population. Social workers and others should also participate in ongoing research to elucidate in much greater detail the capacities of 17-24 year old males, particularly in relation to suitability for combat duty.

### **Definition of Informed Consent**

The process of informed consent is utilized and applied in the medical and legal fields, for the protection of individuals receiving services. For the purpose of this thesis, informed consent will be defined according to the National Institute of Health's Belmont Report (1979): "...the consent process can be analyzed as containing three elements: information, comprehension and voluntariness" (Part C. para. 3). These three elements of consent will be reviewed in Chapter V considering ethics.

### **Thesis Chapters Summary**

The following summary of Chapters II – VI will review essential aspects of this theoretical thesis. Chapter II will describe the conceptualization and methodology used. The conceptualization will include: developmental and neurophysiological research related to typical 17-24 year old males; normal developmental vulnerabilities of this age group; and responsibilities of social workers, individuals and society regarding 17-24 year old males serving in combat duty. The methodology section of Chapter II includes: study biases, strengths, and

limitations. Chapter III examines the phenomenon of 17-24 year old enlistees, focusing on the typical psychosocial and neurophysiological development of 17-24 year old males in the United States (U.S.), as well as the consequences of their participation in combat duty. Chapter IV analyzes why 17-24 year old males are particularly vulnerable to the consequences of military recruitment and wartime deployment through an examination of the normal psychosocial, neurophysiological and hormonal developments of this age group. Chapter V discusses informed consent, as well as the responsibility of social workers, individuals and our collective society to disseminate current research, advocate and intervene, on behalf of 17-24 year old males regarding insertion into combat duty. Chapter VI relates psychosocial and neurophysiological developmental theories, as well as ethical theories, to the role of the military in the lives of 17-24 year old males, and the potential consequences of this age group's participation in combat duty. Implications of this thesis, as well as recommendations, limitations, and direction for further research are also discussed in Chapter VI.

I selected a theoretical thesis with further research in mind. My intention was to collect current research on the development of 17-24 year olds, and the ethical implications of individual and collective responsibility, to develop a foundation of data to promote empirical research. I intended to utilize these data to examine whether my impression is correct that there is at least reasonable doubt regarding the appropriateness of the current age of enlistment for combat duty. I was, however, aware of the need to remain open to disconfirming evidence that my impression could be mistaken, no matter how certainly correct it seemed to me as I began the research.

In terms of other personal bias I ought to disclose, I concede to a predisposition toward the protection of young adult males for the following reasons: I was in the Naval reserves trained

as a field medic (though never deployed into combat); I have worked for over 20 years with adolescents and young adults (primarily males); my professional area of focus has been survivors of various types of trauma and the sequelae of Complex Posttraumatic Stress Disorder; and I am the parent of two male children.

## **CHAPTER II**

### **Conceptualization and Methodology**

#### **Conceptualization**

In psychosocial research, prominent developmental theorists have defined the period between approximately 17 and 24 years of age as a stage of young adult identity development (Arnett, 2006, 2007; Cote, 2000; Erikson, 1950, 1963). Additionally, since the 1980s, researchers have suggested this age group experiences an extended phase of adolescence into young adulthood; in United States (U.S.) industrialized society, they encounter less societal pressure than previous generations to immediately enter the work force, or marry and begin a family post-secondary education (Arnett, 2000 pp. 470-471). Rather, they face an immediate future with less structure than the same age group from previous eras and more choices (Arnett, 2007).

From the perspective of neuroscience, brain researchers have concurred the executive functions of the brain are not fully developed until approximately 25 years of age (Casey, Giedd & Thomas 2000; Giedd, 2006; Johnson et al., 2009). Scientists also have suggested that developmental vulnerabilities during this time period including inconsistent decision-making, the perception of invulnerability to danger, and emotionally based decision-making are due to ongoing developmental processes (Arnett, 1992; Casey et al., 2010; Giedd, 2008; Lapsey & Hill, 2010). Additionally, from adolescence to the mid-20s, the brain is engaged in neuronal pruning, myelination and integration of brain regions, and is influenced by the release of sex hormones

and neurotransmitters (Dahl, 2003; Johnson et al., 2009; Lenroot & Giedd, 2006; Winter, 2004; Weinberger, Elveag & Giedd, 2005).

One post-secondary education option for 17-24 year old males is to enlist for combat duty in the U.S. military. According to the findings of researchers studying psychosocial and neurophysiological development, the young person's appreciation of the outcomes of this decision may be significantly undermined by typical developmental vulnerabilities confounding the capacity to fully conceptualize consequences (Arnett, 2007; Giedd, 2008; Johnson et al., 2009). These vulnerabilities include: continuing development and integration of the prefrontal cortex with the limbic system and other brain regions, as well as an influx of hormones and neurotransmitters exerting influence on the limbic system/emotional center of the brain (Giedd, 2008; Johnson et al., 2009).

The National Association of Social Workers (NASW) explicitly states in its Code of Ethics preamble (2008) that there is a special professional responsibility to vulnerable populations. Therefore, the current brain research about typical developmental vulnerabilities of 17-24 year old males, as well as the increased risks of combat duty, would seem to require professional social workers to implement their ethical responsibilities. The NASW (2008) preamble stated,

The primary mission of the social work profession is to enhance human wellbeing ... with particular attention to the needs and empowerment of people who are vulnerable... A historic and defining feature of social work is the profession's focus on individual wellbeing in a social context and the wellbeing of society.  
(para. 5)

These responsibilities include advocacy, education and contributing to related research. For the wellbeing of 17-24 year olds, young adult advocates have an obligation to call on social workers to assist in the development of reasonable expectations, policies, and protections for 17-24 year old males, regarding the age of insertion into military combat.

Moreover, current theorists in the field of ethics have contributed to the discussion of individual and collective responsibility (Isaacs, 2006; Kutz, 2002; Oelofsen, 2008; Peterson, 2006;). In this thesis, selected theories will be utilized to discuss societal responsibilities to 17-24 year olds. I will examine societal norms and expectations, while comparing them to current findings in cognitive and psychosocial development and neuroscience. Additionally, macro/meso level policies/protections (i.e., the precautionary principle and professional social worker ethical responsibilities), as well as micro/meso level ethical standards and guidelines outlined in the Belmont Report (1979) will be addressed.

## **Methodology**

Psychosocial and neurophysiological developmental theories were chosen to analyze the typical development of 17-24 year old males, including normal developmental vulnerabilities of this age group. I utilized a discussion of successive, salient points to interpret typical development of 17-24 year old males in the United States (U.S.), as well as data regarding the consequences of their participation in combat duty. I analyzed results from empirical studies and evaluated outcomes germane to my statement of purpose. Additionally, I selected the work of theorists in the field of ethics to assist in the examination of individual and collective responsibility. I also elected to examine professional social workers' ethical responsibilities to vulnerable populations and society; in contemporary mental health settings, social workers are often in the forefront of serving veterans. I included an examination of the precautionary

principle: a macro level set of guidelines developed to evoke protections, in the case of likely harm to human beings and the environment. The precautionary principle will be applied to 17-24 year olds enlisting for combat duty in the U.S. military.

### **Strengths and Limitations**

Utilizing longitudinal studies, reinforced by subsequent research, offered credence to my plan for analysis (Casey et al., 2000; Dahl, 2003; Giedd, 2008; Johnson et al., 2009). Employing the theories of prominent cognitive and psychosocial researchers, whose work has been outstanding in the field for more than two decades, providing the foundation for the current developmental paradigm also strengthened my discussion (Arnett, 1998, 2007, 2009; Erikson, 1950,1963; Piaget, 1950; Tanner, 2006; Tanner & Arnett 2009).

The limitations regarding the analysis of the phenomenon included: some aspects of human development are uniquely individual; some of these unique aspects are based on genetics, environmental conditions and life experiences, rather than an expectable trajectory, making my final assertion about the vulnerability of young adult males considering military combat inconclusive. Other factors limiting my study include: focusing exclusively on male development; much of the research was primarily conducted with Caucasian college students as participants; and, finally, data for this thesis were derived exclusively from prior research.

Having reviewed the conceptualization and methodology of the phenomenon, Chapter III will delineate the typical psychosocial and neurophysiological development of 17-24 year old males in the United States (U.S.), as well as the consequences of their participation in combat duty.

## **CHAPTER III**

### **THE PHENOMENON**

This chapter focuses on the typical psychosocial and neurophysiological development of 17-24 year old males in the United States (U.S.), as well as the consequences of their participation in combat duty. First, the work of two contemporary developmental theorists relevant to this age group will be examined, as well as their influence on current societal expectations within the U.S. Second, typical developmental tasks and challenges will be discussed, followed by a section on incentives for military enlistment and participation in combat as a solution to these tasks and challenges. Finally, a review of the documented consequences of combat duty for 17-24 year olds will be presented.

#### **Developmental Theory**

Two developmental theorists, Erik Erikson and Jeffrey Arnett, developed psychosocial theories that are fundamental to discussing normal development as well as the theoretical underpinnings of current societal expectations for this age group. Erikson (1950, 1963) developed a widely accepted eight-stage theory of psychosocial development throughout the life span. He concluded that the eight-stages are not only predetermined but that unsuccessful completion of any stage creates a cumulative negative risk to individuals' psychosocial development as they continue to move through developmental stages. Erikson considered the major developmental task for late adolescence to be consolidating identity (versus role confusion) and intimacy (vs. isolation) the psychosocial challenge for young adulthood. He



proposed the individual's tasks to be those of learning answers to questions of self-discovery, i.e., "Who am I?" followed by navigating intimate relationships. He stated that if accomplishing these tasks were unsuccessful, young adults could experience varying levels of identity confusion and isolation.

Erikson's eight-stage psychosocial theory of development describing the period between 17 and 24+ years of age as a time of identity and relationship development, concurs with more contemporary developmental theorists (Cote, 2000; Arnett, 1992, 2007; Arnett & Tanner, 2006). However, his stage theory was primarily task focused, rather than addressing societal influence and issues of developmental capacity. Erikson developed his psychosocial theory at a time when career and starting a family were among the few socially sanctioned tasks signifying adulthood. Currently, in the U.S., the majority of young adults are deferring marriage and family to approximately "...five to ten years later" than previously reported from the early 1960s (Arnett, 2000, pp. 470-471).

Arnett is a developmental theorist who has studied 18-25 year olds extensively; he offers a similar but more contemporary view of this age group to that of Erikson with the current social/societal structure in mind. He defined the time period from 18-25 years old as "emerging adulthood" and identified five developmental tasks particular to this period including, "...identity exploration ... instability ... self-focus ... feeling in-between, and the age of possibilities" (p. 208). Arnett, suggested that industrialized societies like the United States have created a new or extended developmental stage of individuation and identity development for this age group. Arnett (2007) stated: "Theorists have emphasized how in recent decades the life course in industrialized societies has become increasingly characterized by individualization, meaning that institutional constraints and supports have become less powerful... ." (p. 69).

Considering the contributions of both Erikson (1950, 1963) and Arnett (2007) to the theory of psychosocial development, at this time in the United States, 17-24 year olds are navigating the task of identity development into their mid twenties. According to Arnett, they are doing so because they are not as heavily influenced, as were previous generations, by “institutional and social constraints” (p. 69). Erikson’s theory is still relevant, but the age range of developmental stages has extended; 17-24 year olds are navigating identity and roughly 26-40 year olds are facing the developmental task of establishing “intimacy vs. isolation.” Erikson’s and Arnett’s theories differ significantly in that Arnett finds a changing societal structure involving 17-24 year olds and, in turn, evolving expectations of self have created a new and extended developmental paradigm, manifesting as an extended time between adolescence and adulthood.

### **Typical Developmental Choices and Challenges for 17-24 Year Old Males**

Young males face numerous developmental choices and challenges in the extended phase between adolescence and adulthood: identity development; engaging in post-secondary education; deciding whether or not to continue residing with parents; coping with unemployment or entry level, low paying service positions; choosing cohabitation over marriage; and choosing whether or not to begin a family. According to Wight Wight, Chau, Arantaini, Schwartz and Thampi (2010), of the “29.3 million young adults aged 18 to 24 ” in the United States, “... 45.5 percent ... are enrolled in school and 52.8 percent of this same age group are living at home with their parents,” leaving many to live in the same context as they did in adolescence (p. 4). In addition, The U.S. Congress Joint Economic Committee (2010) reported that, “... one in five 18 - 24 year olds are unemployed ... they comprise 13 percent of the labor force, but make up 26 percent of the unemployed” (p. 1). The Committee also reported, “Young workers are

concentrated in sectors of the economy . . . such as retail trade and leisure and hospitality” (p.1). These areas of employment are generally entry level and low paying compared with jobs that require a bachelor’s or graduate degree. In addition, these jobs tend to be subject to fluctuations in the economy.

In past generations, 17-24 year olds were more likely to comply with societal expectations leading most to get married, begin having a family and start careers to support that family directly after high school. These social norms have been changing since approximately the 1960’s when birth control became more widely available (Arnett, 2000). Wight, et al. (2010) reported that in 2009 the average age of marriage for men was 28 and the average age of first birth for women was 25. In 1960, the average age of first birth for women was 20. Wight also identified three distinct features of this 17-24 year old developmental period when he stated, “...important milestones include completing school, living independently, and being employed full-time” (p. 4). Arnett (2007) documented that many 17-24 year olds today continue living at home with parents and instead of getting married, or are cohabitating but not marrying while experimenting with intimate relationships (p. 69). In our current economy, those 18-24 year olds who are not attending college for a variety of reasons are left with few options that provide avenues to the independence most identify with adulthood.

### **Is Military Enlistment a Solution to Developmental Challenges and Choices?**

Enlistment in the military has provided past and current generations a solution for 17-24 year olds seeking financial security or a college education, particularly in the current economic climate. A study by Schacherer (2005) determined rates of, and conditions impacting, 17-24 year old military enlistments for individual U.S. states. Descriptive data were collected including: state enlistment rates, number of 18-24 year olds pursuing a college education, number of

veterans, unemployment rate, and number of voters. Schacherer concluded, "...18-24 year olds that enlist in the military may do so in order to obtain the basic living standards more so than an attempt to obtain employment only" (p. 82). The Schacherer study was conducted with data collected from the 2000 census, when the unemployment rate in the U.S. was 3.9 percent and the poverty rate was 11.9 percent (p. 80). Since 2000, the basic standard of living has declined dramatically for many individuals, due to the 2008 U.S. recession and housing market crisis. This decline in the standard of living is reflected in the Bureau of Labor and Statistics (2012) unemployment rate of 8.1 percent (p.1). Additionally, the US Census Bureau (2011) reported a 15.1 percent poverty rate (para. 1). According to an executive report released by the Department of Defense (2000) and (2010), active duty enlistment totaled 1.4 million in 2000, remaining stable until 2008. In 2008, the number of active duty enlisted rose to 1.16 million and by 2010, rose again to 1.42 million, supporting Schacherer's assertions about the economic impetus for enlistment (Active Component Enlisted Force 2000 chapter 3 para. 1; Active Component Enlisted Force 2010, Section 1, Table 1, p.5)

Bachman, Segal, Freedman-Doan and O'Malley (2000) analyzed nationwide data of 100,000 high school students late in their senior years, regarding propensity for military enlistment prior to graduating from high school and the number who enlist. They additionally completed a follow up with 15,000 of the students and concluded:

Men who serve tend to come disproportionately from minority racial and ethnic groups, below-average socioeconomic background, non-suburban residence, and regions other than the Northeast or West. They tend to have received mediocre grades in high school, to come from nonacademic high school programs, and to have low college aspirations. (p. 26)

Therefore, in 2008, monetary gain became an even stronger motivation for young males who obviously have fewer economic options.

More recently, Segal was interviewed by The Wisconsin Journal (2011) and stated, “The main reasons for enlisting haven’t changed since the advent of the Cold War: to improve social status and gain monetary and educational benefits, to serve the country and to do something adventurous.” (para. 15)

Kleykamp (2005) studied a 2002 cohort of high school graduates from the state of Texas to determine factors leading to military enlistment versus enrolling in college. Kleykamp stated, “... educational benefits appear to be a key draw to enlistment” (p. 287). Moreover, according to the U.S. Department of Education’s National Center for Education Statistics (2011), the average cost of a four year college has risen “...from \$12,195 in 1990 to \$20,986 in 2009-2010, a 58 % increase in the average cost of college” (Table 345). Therefore, since 1990, the increasing cost of post-secondary tuition is surmised to be prohibitive for a percentage of young males with college aspirations, but fewer financial resources -- establishing military enlistment as an appealing option.

Furthermore, the military offers other increases in one’s living standard beyond a bi-monthly paycheck: there are room and board, medical benefits, training, the above-noted money for college, as well as college loan repayment. These are only a few of the enlistment benefits offered to prospective recruits. Additionally, a variety of enlistment bonus/pay incentives exist, as well as life insurance and retirement benefits. According to the Under Secretary of Defense (2011), military pay for enlisted active duty personnel begins at \$1467.00 per month for new recruits (E-1) and increases incrementally to \$4634.70 - \$7195.80 per month for senior enlisted

(up to E-9). The Under Secretary of Defense, described enlistment benefits and how they compete with those of the civilian private sector:

The Military has a wide variety of benefits ranging from complete health care to commissary and exchange shopping. A recent ... review of active duty military benefits noted that when comparing the types of benefits offered by the military with those offered in the private sector, all the core benefits offered by most private sector firms -- retirement pay, health care, life insurance, and paid time off -- are offered by the military. In fact, the ... review found that military benefits in some cases exceed those offered by the private sector. (para. 1)

An enlistment bonus that is a significant draw for those individuals specifically seeking higher education is The Montgomery GI Bill (MGIB). The MGIB is the college tuition program offered by the military. A report from the Department of Veteran Affairs (2011) stated,

The MGIB program provides up to 36 months of education benefits. This benefit may be used for degree and certificate programs, flight training, apprenticeship/on-the-job training and correspondence courses ... Generally, benefits are payable for 10 years following your release from active duty (para. 2).

The American Council on Education (Radford, 2009) noted, “During the 2007-08 academic year, approximately 660,000 veterans and approximately 215,000 military service members were enrolled in undergraduate education ... .” (p. vi).

Reviewing incentives offered by the military, as well as the research suggesting that many 18-24 year olds enlist to increase their living standard and pay for college, gives rise to the question, “How many 18-24 year olds enlist?” The Executive Summary from the Office of

Under Secretary of Defense, Personnel and Readiness (2005) reported the following statistics for the fiscal year (FY) 2005.

The active duty military comprises a younger workforce than the civilian sector. Service policies and legal restrictions account for the relative youthfulness of the military. In FY 2005, 88 percent of new active duty recruits were 18 through 24 years of age compared to 37 percent of non-institutionalized civilians. The mean age of new active duty recruits was approximately 20. Almost half (47 percent) of the active duty enlisted force was 17-24 years old, in contrast to about 14 percent of the civilian labor force. (para. 3)

Additionally, The Executive Summary from the Office of Under Secretary of Defense, Personnel and Readiness (2005) outlined the percentages of active duty personnel in various occupations within the military in 2005:

30 percent of FY 2005 active duty enlisted personnel were in occupations such as infantry, craftsmen, and service and supply handling ... 43 percent served in mid-level skill jobs in medical and dental ... administration, and electrical/mechanical equipment repair... 21 percent were [in] high-skill areas, including electronic equipment repair, communications and intelligence. (para. 25)

Military occupations are most often determined prior to enlistment. Military applicants are required to complete The Armed Services Vocational Aptitude Battery (ASVAB) before enlistment. “[S]cores are used to determine if you are qualified to enlist ... and to assign you to an appropriate job in the military” (para. 5). As reported on the Official Armed Services Vocational Aptitude Battery (ASVAB) web site (2012):

Scores on the individual ASVAB subtests are reported as Standard Scores.

Standard Scores are scores that have a meaning relative to a national sample of youth aged 18 to 23. About half the population scores at or above a Standard Score of 50 and about 16% of the population scores at or above a Standard Score of 60 . . . . Each Service develops and validates its own set of composites . . . .

Applicants' scores on these composites are used to help determine the military occupations for which an applicant is best suited (para. 1).

The significance of the ASVAB scoring is that those who score the lowest often end up on the front line. These young men may have additional vulnerabilities such as poverty, and coming from communities with high crime and substandard schooling.

### **Consequences of Military Enlistment for 17-24 Year Olds**

The Executive Summary of The Office of the Under Secretary of Defense, Personnel and Readiness (2010) reported demographics for active duty enlisted personnel. The following are statistics pertinent to this research project. Army and Marine statistics are provided due to these branches of the military having a higher exposure to combat and casualty rates. Active duty enlisted totaled 1,182,657; of those, 520,676 were 24 years old or younger and 80,090 were 17-19 years old. Active duty Army and Marine 17-24 year old enlisted personnel totaled 284,561 (169,683 and 114,878 respectively). Marine enlisted 17-19 year olds totaled 22,669 (Appendix A, Table A-1). Preston and Buzzell (2006) stated:

Differences in death rates according to the branch of service overwhelmingly reflect differences in exposure to combat. . . . [T]he rate of death for Marines is more than double that of any other branch of service . . . . Army troops are intermediate; their death rate is virtually identical to that of all service personnel



in Iraq combined ... most members of the active Army are in combat forces.

(para. 8)

Additionally, the Department of Defense Workforce Statistics (2012) reported active duty Marine and Army enlisted personnel (E1-E4) junior enlisted personnel experienced the highest casualty and injury rate in Iraq and Afghanistan. Tables 1-4 below are casualty statistics and numbers wounded for E-1 to E-4, 17-24 year olds from 2003-2012 in Iraq and Afghanistan.

These statistics were adapted from the Department of Defense Military

Casualty Information (2012):

Table 1  
2003-2012  
Operation Iraqi Freedom U.S.  
Casualties <22-24 Years of Age

Casualties		# of Casualties	% of Casualties
Total Casualties		4,409	
E1 - E4*	total	2,540	58%
	<22	1,283	29%
	22-24	1,073	24%
Army	total	3,233	73%
	<22	789	18%
	22-24	790	18%
Marines	total	1,022	23%
	<22	473	11%
	22-24	257	6%
Navy	total	103	2%
	<22	15	0%
	22-24	17	0%
Air Force	total	51	1%
	<22	6	0%
	22-24	9	0%

Table 2  
2003-2012  
Operation Iraqi Freedom U.S. Wounded  
Wounded <22-24 Years of Age

Wounded		# of Wounded	% of Wounded
Total Wounded		31,924	
E1 - E4*	total	19,672	62%
	<22	8,890	28%
	22-24	7,992	25%
Army	total	22,218	70%
	<22	5,262	16%
	22-24	5,761	18%
Marines	total	8,622	27%
	<22	3,432	11%
	22-24	1,974	6%
Navy	total	637	2%
	<22	131	0%
	22-24	153	0%
Air Force	total	447	1%
	<22	65	0%
	22-24	104	0%

\* E = Rank for Enlisted Personnel

Adapted from: Department of Defense Military Casualty Information (2012)

<http://siadapp.dmdc.osd.mil/personnel/CASUALTY/castop.htm>

Table 3

2001-2012 Operation Enduring Freedom U.S. Casualties <22-24 Years of Age			
Casualties		# of	% of
		Casualties	Casualties
Total Casualties		1,951	
E1 - E4*	total	968	50%
	<22	442	23%
	22-24	450	23%
Army	total	1,354	69%
	<22	281	14%
	22-24	296	15%
Marines	total	407	21%
	<22	142	7%
	22-24	122	6%
Navy	total	104	5%
	<22	14	1%
	22-24	15	1%
Air Force	total	86	4%
	<22	5	0%
	22-24	17	1%

Table 4

2001-2012 Operation Enduring Freedom U.S. Wounded <22-24 Years of Age			
Wounded		# of	% of
		Wounded	Wounded
Total Wounded		15,858	
E1 - E4*	total	9,693	61%
	<22	3,715	23%
	22-24	4,240	27%
Army	total	10,736	68%
	<22	2,405	15%
	22-24	2,968	19%
Marines	total	4,446	28%
	<22	1,236	8%
	22-24	1,117	7%
Navy	total	313	2%
	<22	54	0%
	22-24	87	1%
Air Force	total	363	2%
	<22	20	0%
	22-24	68	0%

\* E = Rank for Enlisted Personnel

Adapted from: Department of Defense Military Casualty Information (2012)

<http://siadapp.dmdc.osd.mil/personnel/CASUALTY/castop.htm>

Helwick (2011) stated that of all casualties in Iraq and Afghanistan “Combat casualties occurred predominantly in males (98.5%), army soldiers (78.1%), and junior enlisted men (59.2%)” (para. 7). Interestingly, the Tables just presented do not refer to ages of those killed and wounded as “18, 19, 20... “ but group those very young dead or injured as “<22.”

In addition, Preston and Buzzell (2006) discussed links between casualty rates, branch of service and age of troops in Iraq:

What may be more surprising is the exceptionally large mortality differences by age ... . Troops aged 17-19 have a death risk that is 4.6 times that of those aged 50 or higher ... . One contributing factor to this gradient is doubtless the distribution of rank by age. Another contributor, perhaps less obvious, is the distribution of service affiliation by age. (para. 13)

According to Preston and Buzzel (2006) summarizing data from the Defense Manpower Data Center for the same year,

64.7% of Marine deployments to Iraq were of persons aged 24 or younger, compared to only 39.5% of Army deployments. Marines bear the greatest risk, and they are disproportionately very young. Inexperience within a rank and branch of service may also contribute to the high death rate of young troops. ...

One of the oldest observations in the social sciences is that lower-ranking individuals experience a greater risk of death than higher-ranking individuals. ... US military deaths in Iraq present a clear example of this relationship. ... In the Army, enlisted men have 40% higher mortality than officers; in the Marines, the differential is 36%. (para. 13)

In addition to combat casualty statistics, Helwick (2011) reported on combat injuries in Iraq and Afghanistan:

A comprehensive look at combat injuries among the almost 2 million service members deployed in Iraq and Afghanistan from 2005 to 2009 showed. ... The main distribution of combat wounds was as follows: extremities (52%), head and neck (28%), thorax (10%), and abdomen (10%). Almost 75% resulted from explosive mechanisms; just 20% were gunshot wounds. (para. 1-9)

As stated above, Helwick (2011) reported approximately 75% of all combat injuries resulted from explosive devices. A resulting outcome is a large percentage of soldiers returning home with Traumatic Brain Injury (TBI) and related injuries. The Institute of Medicine (2010) reported:

TBI is the most common injury among those wounded in OEF and OIF ... . In 2003–2007, the Military Health System (MHS) recorded that 43,779 patients had a diagnosis of TBI. The estimates vary: some studies have found that about 10–20% of veterans returning from OEF and OIF have TBI, and others have found that TBI accounts for up to one-third of all battlefield injuries ... several outcomes that can persist even after mild TBI, include unprovoked seizures, depression, aggression, and post concussive symptoms, such as memory problems, dizziness, and irritability. TBI can cause life-long impairments. ... TBI can also lead to disruptions in higher-level functions of everyday life, including social relationships, independent living, and employment. In many cases, hearing loss accompanies TBI. ... Combat troops who are exposed to a blast that results in mild TBI are at risk for visual dysfunction. (pp. 63-65)

In addition to the potential devastating impact of TBI alone, The Institute of Medicine (2010) reported:

Some combination of comorbid PTSD, major depression, and TBI is not uncommon in OEF and OIF veterans. The report noted that about one-third (666,666 of 2 million) service members who have been deployed have at least one of the three conditions, and about 5% manifest symptoms of all three (100,000 of 2 million deployed). (p. 64)

Through study of the Vietnam era, researchers have discovered combat soldiers under 25 years old to be more vulnerable to PTSD. Dohrenwend et al., (2008) stated, "...most strongly related to current PTSD are educational level, AFQT score, and pre-Vietnam age (especially the difference between those under 25 and those 25 and over)" (p. 138).

Furthermore, emotional and physical disabilities are not the only problems veterans have to contend with when they return home. The Bureau of Labor and Statistics (2010) reported the following statistics:

- 18 to 24 year old returning veterans: 30.4 percent unemployment in October
- Non-veterans 18-24 had a 15.3 percent unemployment rate.
- African American veterans face a 48% unemployment rate for the same period (Table 1).

In addition to significant unemployment rates for the youngest veterans and an increased potential to return from combat with debilitating physical or emotional injuries, Saxon (2011) commented about drug and alcohol issues with returning veterans:

In a 2-item survey of 6527 US Army soldiers who were screened after returning from deployment to Iraq, 27% screened positive for alcohol misuse, and rates of drinking and driving and reporting late to duty because of hangovers were high. In a separate survey of 1120 recently deployed soldiers, 25% screened positive for alcohol misuse and 12% for alcohol-related behavioral problems. Exposures to life-threatening situations and to atrocities were significantly associated with a positive screen. (para. 4)

Not only do the physical and emotional consequences of war impact individual veterans, but also spouses, partners, children, family, co-workers and other community members. Price

and Stevens (2009) in a review of research findings on Posttraumatic Stress Disorder (PTSD) of Vietnam Veterans, for The United States Department of Veteran Affairs, reported:

The effect of PTSD on intimate relationships reveals severe and pervasive negative effects on marital adjustment, general family functioning, and the mental health of partners. These negative effects result in such problems as compromised parenting, family violence, divorce, sexual problems, aggression, and caregiver burden. ... Approximately 38% of Vietnam veteran marriages failed within six months of the veteran's return from Southeast Asia. The overall divorce rate among Vietnam veterans is significantly higher than for the general population, and rates of divorce are even higher for veterans with PTSD. ... Rates of divorce for veterans with PTSD were two times greater than for veterans without PTSD. Moreover, veterans with PTSD were three times more likely than veterans without PTSD to divorce two or more times. (para. 5)

In addition to increased interpersonal difficulties for veterans, the Institute of Medicine (2010) reported on the issue of homelessness:

...about one-third of the homeless population served in the military at some point. Many homeless veterans served during the Vietnam era (47%), although veterans of other periods are also homeless or at risk for being homeless. Almost half the homeless veterans have some mental disorder, almost 70% have a substance-use disorder... (p. 83)

For CBS news, (2009) reported on one of the most troubling statistics regarding our male veterans: suicide rates. She provided a detailed account of how data were collected from the Department of Defense, the Department of Veterans Affairs, the National Center of Health

Statistics, the Center for Disease Control and Prevention, and the vital statistics departments of all 50 states. Malbran (2009) began by stating, "... the suicide rates are 31.5 to 35.3 per 100,000 male veterans and 17.6 per 100,000 for non-veteran males" (para. 34). Malbran (2010) also stated:

The suicide rate among 18 to 29-year-old men who've left the military has gone up significantly ... young veterans in their early 20's were killing themselves at an unusually high rate back in late 2007... the rate of suicide among young veterans was an estimated two to four times higher than any other age group. (para. 1-2)

Shinseki (2010), from the Department of Veteran Affairs stated, "Of the more than 30 thousand suicides in this country each year, fully 20 percent of them are Veteran suicides. That means, on average, eighteen Veterans commit suicide each day" (para. 3).

The data in this chapter have identified our youngest soldiers, 17-24 years old, as particularly vulnerable to the emotional and physical consequences of war, including death. The next important question to ask is "Why"?

## **CHAPTER IV**

### **Vulnerabilities within Typical Development for 17-24 Year Old Males**

In examining the reasons 17-24 year old males are particularly vulnerable to the consequences of military recruitment and wartime deployment, the focus of this chapter is the normal neurological and hormonal developmental of this age group. This chapter will first briefly discuss an influential cognitive theorist, Jean Piaget, and his contributions to U.S. societal and cultural schemas regarding brain development and subsequent behavioral expectations for 17-24 year olds. Second, this chapter will provide an analysis of the current research on brain development and, third, discuss what is known about accompanying hormonal and dopamine neurotransmitter changes in 17-24 year old males, as they exert influence on various aspects of decision-making.

#### **Cognitive Theory**

Prior to advancements in brain imaging technology, Piaget (1950) provided a stage model of cognitive theory consisting of four sequential phases considered relevant today. Piaget was a prolific and esteemed researcher of infant and child cognitive development. His stage theory, supported by extensive research, assisted in cementing a societal paradigm of adult developmental and behavioral expectations for 17-24 year olds. Stage I through Stage III (ages 0-11) is relevant, as this time period spans human developmental processes to pre-adolescence: assimilation of perceptions and motor operations; pre-logical thought and intuitive reasoning; and concrete thinking and knowledge development through the senses. Piaget described Stage IV



(ages 11-15) as Formal Operational Intelligence: “The subject becomes capable of reasoning in a hypothetical deductive manner . . . .” (p. 161).

Piaget theorized that cognitive development was essentially complete when formal operational thinking is attained – usually by age 15. However, some individuals never attain a capacity for formal operational thinking; this is the level involving a capacity for abstract thought, the level required for evaluation and informed decision making (p.134). As discussed in the next section, current brain researchers (Giedd, 1999; Giedd, 2008; Johnson et al., 2009; Gogtay et al., 2004) are challenging Piaget’s notion that cognitive maturation is complete in most people by age 15.

### **Neurophysiological Development**

Researchers are in the early stages of deciphering typical development of the 17-24 year old Prefrontal Cortex (PFC) and the integration of the PFC with the limbic system. Prior to 1977, physically (and ethically) researching the human brain was impossible, due to the limitations of science and technology. With the advent of the Magnetic Resonance Imaging (MRI) and also Functional MRI (fMRI) capabilities, scientists were able to shed new light on the inner workings of the human brain. Casey et al. (2000), Lenroot and Giedd (2006), and recently Johnson et al. (2009) provided compelling evidence that the prefrontal cortex, considered the primary locus of executive functions of the brain, was not fully developed until approximately age 25. Until now, such hallmarks of adolescence and young adulthood as impulsivity, lability, and risk taking have by U.S. society been generally attributed to an influx of hormones; however, with the advent of findings from the neural imaging studies, brain researchers are discovering there is much to consider in addition to hormones.

In 1989, the Child Psychiatry Branch National Institute of Mental Health (NIMH), began “... the first large-scale longitudinal brain study of its kind that is ongoing to date” (Giedd, 2008, p.321). Giedd (2011) stated the purpose of the correlational study was to “...explore the relationship between genes, brain and behavior in healthy development and in neuropsychiatric disorders of childhood onset” (para. 2). Giedd (1999) as well as Lenroot and Giedd (2006) reported the study design for this population included: two-year interval fMRI scans, clinical interviews, family history assessments, as well as neuropsychological and DNA testing. The study’s initial 95 male and 65 female participants ranged from 4-21 years of age. The initial NIMH 1989 study began with 130 typically developing participants (determined through extensive screening) and conducted 349 fMRI scans. In 2005, 2000 participants ranging from 3-30 years of age had provided approximately 4000 scans “...about half typically developing and half from various diagnostic groups, such as ADHD and childhood-onset Schizophrenia” (Lenroot & Giedd, 2006, p. 722).

In 2007, Giedd (2008) reported the study had expanded to “5000 scans from 2000 subjects” (p. 336). This ongoing longitudinal study spanning 22 years has provided unprecedented data regarding the development of the human brain from early childhood through young adulthood. It also has broad implications for shedding new light on typical brain development, and a variety of debilitating brain disorders. Support of NIMH provided cutting edge technology (i.e., MRI and fMRI), top researcher involvement and the reputation and resources to recruit and maintain a large sample size spanning over two decades. Additional strengths of the study included 400 twin participants as well as the already mentioned split sample between typically developing and various diagnostic categories. This range of participants not only allowed researchers the ability to capture normal brain development but

also genetic influences and aspects of disordered brain development (e.g., schizophrenia, Attention Deficit Hyperactivity Disorder). The sample's diversity was less well described: the only mention of participant ethnicity regarding this neurological study was when Giedd (1999) reported, "There were no significant sex differences for age, Tanner stage, ethnicity, socioeconomic status, height, weight or handedness" (p. 861).

This NIMH longitudinal study's extensive data as well as that from other research established that the prefrontal cortex remains in a critical stage of development between 17 and 24 years of age (Casey et al., 2000; Weinberger et al., 2005; Giedd, 2008; Johnson et al., 2009). The prefrontal cortex is responsible for executive function: "... a term encompassing a broad array of abilities, including attention, response inhibition, regulation of emotion, organization, and long-range planning" (Johnson et al., 2009, p. 340). Johnson et al. (2009) explained,

Throughout childhood and into adolescence, the cortical areas of the brain continue to thicken as neural connections proliferate. In the frontal cortex, grey matter volumes peak at approximately . . . 12 years of age in boys reflecting dendritic overproduction. Subsequently, rarely used connections are selectively pruned making the brain more efficient . . . . Pruning also results in increased specialization of brain regions . . . in general, loss of gray matter progresses from the back to the front of the brain with the frontal lobes among the last to show these structural changes. Neural connections that survive the pruning process become more adept at transmitting information through myelination. Myelin, a sheath of fatty cell material wrapped around neuronal axons . . . allows nerve impulses to travel throughout the brain more quickly and efficiently and facilitates

increased integration of brain activity. . . . Evidence suggests that, in the prefrontal cortex, this does not occur until the early 20s or later. (p.217)

This increased specialization and integration of, in particular, the hippocampus, amygdala and the caudate nucleus (parts of the limbic system) with the prefrontal cortex is recognized as a period where adolescents and young adults transition from loosely associated cognitive functions and emotional based decision making to more integrated cognitive, emotional processes. The hippocampus is important in forming new memories and in dopamine's influence on reward and new learning; the amygdala processes emotional information and the caudate nucleus "relays" information to the prefrontal cortex (Weinberger et al., 2005, p. 10).

Winter (2004) stated that the amygdala and nucleus accumbens (both located within or near midbrain) play a significant role in developmental vulnerabilities:

An immature nucleus accumbens is believed to result in preferences for activities that require low effort yet produce high excitement. . . . It is believed that a developing amygdala contributes to two behavioral effects: the tendency for adolescents to react explosively to situations rather than with more controlled responses, and the propensity for youth to misread neutral or inquisitive facial expressions of others as a sign of anger. (p. 2)

Baird et al., researchers at Harvard, conducted an MRI study (1999) that illustrated this difference in brain development/brain functioning between the adult and the adolescent brain in relation to facial recognition. The study compared findings from previous adult MRI facial recognition studies to those of 12 typically developing adolescents, ages 12-17 (Breiter & Rauch 1996; Morris et al., 1996; Baird et al., 2009). The participants were asked to look at pictures of neutral faces and faces "showing expressions of fear"; they were asked to interpret the

expressions. The researchers discovered that adults and adolescents process the same information very differently (p.197). Adults tend to engage the limbic system and the prefrontal cortex, allowing for memory and executive functions to assist in the use of reason and logic in their interpretations (Guyer et al., 2008, p. 1576). Adolescents more often engaged the amygdala and tended to respond emotionally. In addition, adults correctly identified emotions expressed on faces (Weinberger et al., 2005 p. 13). The sample size was small. However, previous adult and adolescent facial recognition research, as well as adolescent and young adult brain development studies supported the conclusions (Baird et al., 1999; Breiter & Rauch, 1996; Giedd, 2008; Johnson et al., 2009; Morris et al., 1996).

Decision-making implications of the facial recognition research were as follows. First, adults tend to engage both the limbic and the prefrontal cortex, “allowing for reason and logic” to accomplish the task, while adolescents more often engaged the amygdala, responding emotionally. Second, adults using the limbic system with the prefrontal cortex more often answered correctly. Finally, the findings in relation to decision making implications also suggested adolescents and young adults may have more difficulty interpreting nonverbal facial expressions of others, leading to an increase in inaccurate interpretation of interpersonal interactions.

Johnson et al. (2009) discussed the significance of typical brain specialization and integration:

The prefrontal cortex coordinates higher-order cognitive processes and executive functioning. ...These skills allow an individual to pause long enough to take stock of a situation, assess his or her options, plan a course of action, and execute it.

Poor executive functioning leads to difficulty with planning, attention, using

feedback, and mental inflexibility, all of which could undermine judgment and decision making. . . . Although young children can demonstrate impulse control skills, with age and neuromaturation (e.g., pruning and myelination), comes the ability to consistently use these skills. (p. 217)

The findings identify the prefrontal cortex as not fully integrated with the limbic system and other brain regions, supporting the assertion that 17-24 year olds are at increased vulnerability, compared to their older counter parts, when faced with situations requiring the ability to consistently formulate decisions and control impulses

### **Neurotransmitters, Hormones and 17-24 Year Old Decision Making**

Dopamine is a neurotransmitter and a chemical messenger in the brain essential for the reward/pleasure aspects of learning. Weinberger et al., (2005) described the significance of increased Dopamine receptors to the PFC during adolescence,

Dopamine inputs to the prefrontal cortex grow dramatically during adolescence, probably representing one of the neuronal mechanisms that increase the capacity for more mature judgment and impulse control... the dopamine reward signal becomes especially important in the frontal lobe as ideas . . . become increasingly reinforced and valued... learning is based on reward, [and] the adolescent begins to have the ability to follow an idea in pursuit of a goal, rather than to simply act on instinct. (p. 9)

This time period between 17-24 years old is not only, in Giedd's words, a "use it or lose it" phase regarding neuronal pruning and specialization, but what is learned is reinforced (Giedd, 2004, p. 82). In addition, consistent logical decision making is not yet fully developed when the

brain may be more vulnerable to risky behavior such as drug and alcohol use, as well as traumatic experiences (Dahl 2003; Giedd, 2004; Romeo & McEwen, 2006).

In addition to the ongoing development of the prefrontal cortex, and increased integration with the limbic system for adolescents and young adults, the brain produces a surge of hormones beginning in puberty, and persisting through approximately the 20s (Dahl, 2003, p.10). Dahl (2003) stated,

[B]rain maturation is causing the hormonal increases. Once the hormones begin surging through the blood, however, they can be carried back to the brain where they may exert downstream effects. ... Early neuroendocrine research seemed to indicate that only a few brain areas had receptors for gonadal hormones. More recently, however, scientists have discovered additional types of receptors (such as estrogen receptor beta), which are distributed widely across several brain regions and appear to underpin the effects of some gonadal hormones on higher cognitive functions, mood, and other brain functions. (p. 5)

At roughly the same time when the brain's circuitry is undergoing this complex transformation of neuronal pruning, myelination and integration, puberty is initiated through two systems: the hypothalamic-pituitary-gonadal or (HPG) Axis and the hypothalamic – pituitary – adrenal (HPA) Axis. With the HPG Axis, the Central Nervous System (CNS) signals the hypothalamus to release gonadotropin-releasing hormone (GnRH). GnRH activates the pituitary to release lutenizing hormone (LH) and follicle stimulating hormone (FSH), initiating the release of “androgen sex hormones” from the gonads (i.e., testosterone and androstenedione). HPA Axis activation begins with signaling from the CNS to the hypothalamus. Adrenocorticotropin releasing hormone (CRH) is then released by the hypothalamus, stimulating the production of

adrenocorticotrophic hormone (ACTH) from the pituitary. The adrenal cortex is activated by ACTH to produce androstenedione and dehydroepiandrosterone (DHEA). Both the HPG and HPA Axis trigger the development of the adult reproductive system and other adultlike body features (Buck et al., 2008 p. S193, figure 1). In addition, these hormones alter the brain's cognitive processes and mood by exerting a direct influence on the brain. Forbes and Dahl (2010) discussed pubertal hormones influence on behavior:

...wanting or liking high-sensation, high-arousal experiences ... [an] increase in sensation seeking ... appears to occur at the onset of adolescence ... [and] may be linked directly to the rise in reproductive hormones. ... pubertal hormones influence behavior directly, but they also influence experience, which in turn influences behavior (pp. 68-69).

Bribiescas (2001) stated that these gonadal hormones in men impact mood and are especially active on receptor sites in the emotional center of the brain (p.157). This release of hormones adds to current developmental vulnerabilities, as it alters experience and influences behavior.

### **Danger Invulnerability and Sensation Seeking**

In line with developmental/structural changes during this 17-24 year old period and the release of hormones and neurochemicals that increase the likelihood of emotionally based decision making, Ravert et al. (2009) studied perceived invulnerability and sensation seeking as predictors for risky behavior in a sample size of 1690, male and female, multiethnic 18-25 year old college students from nine US colleges. Each student completed the Arnett Sensation Seeking Inventory, the Adolescent Invulnerability Scale and reported how often in the 30 days prior to the study they had participated in "health compromising" high risk behaviors (p. 763):



Findings demonstrated the utility of danger invulnerability as a predictor of risk behavior among...emerging adults...danger invulnerability predicted engagement in five of the eight risk behaviors measured...danger invulnerability might be most influential in cases where the behavior is considered highly dangerous or deviant...many risky behaviors peak not in adolescence, but in emerging adulthood. Within our emerging adult sample, a consistent positive relationship between age and risk-taking remained before and after controlling for danger invulnerability and sensation seeking... . Danger invulnerability appears to function as a predictor of less common risk behaviors, possibly by downplaying the severity of potential consequences. (p. 767)

The physiological causes of danger invulnerability are not yet known; however, what can be hypothesized from neurophysiological researchers is that the phenomenon of danger invulnerability and sensation seeking involves a combination of the effects of gonadal hormones and selective neurotransmitters on the limbic system, as well as an incomplete integration of the limbic system and the prefrontal cortex (Pharo, Sim, Graham, Gross, & Hayne, 2011).

Young adults' minimizing of the severity of consequences as a normal part of their development is a significant risk factor. A stark example of increased vulnerability due to perceptions of invulnerability is this age groups high mortality rate due to motor vehicle accidents, unintentional injuries, falls, homicide and suicide (Pharo et al., 2011; U.S. Census Bureau, 2007, Table 121).

Brain researchers are increasingly highlighting the strengths and potentials, as well as the range and depth of challenges this age group has to constantly contend with as their minds and bodies go through dramatic changes from adolescence through early adulthood. Parents and

adolescent/young adult advocates have known about the developmental vulnerabilities outlined in this chapter for years without the science to clearly document what they knew. Now that science is beginning to clarify this important development process, what is the responsibility of parents and advocates in developing reasonable expectations, policies, and protections for this vulnerable group?

## **CHAPTER V**

### **Ethical and Moral Responsibilities**

Chapter V will discuss the responsibility of social workers, individuals and our collective society to disseminate current research, advocate and intervene, on behalf of 17-24 year old males regarding insertion into combat duty, as well as the “precautionary principle” and the elements of informed consent. I selected the work of ethical theorists to assist in the examination of individual and collective responsibility. I also elected to examine professional social workers’ ethical responsibilities.

In order to address the question regarding the obligation to disseminate current research, advocate and intervene, the concept of individual and collective responsibility will be examined. This chapter will evaluate the responsibility of professional social workers to educate society, in order to develop reasonable expectations, policies and protections for the people they serve. This chapter will also discuss individual and the collective responsibility to act, as knowledge of developmental vulnerabilities of 17-24 year old males reaches the public. In addition, selected current macro level ethical guidelines, such as the precautionary principle, will be examined, as well as the Belmont Report (1979), which provides micro and meso level ethical standards and guidelines.

#### **Ethical and Moral Responsibilities of Professional Social Workers**

Social workers have been at the forefront of social change and social justice since the 1800’s. In 1840, Dorothea Dix recognized the deplorable conditions in a Massachusetts mental

institution and successfully lobbied for change. Jane Addams established Hull House, the American Settlement Houses, and fought for issues such as child labor laws and juvenile justice (NASW Foundation, 2008). Additionally, Sarah A. Fernandis, Dorothy I. Height, and Whitney M. Young, Jr., as well as many other professional social workers spent their lives and careers advocating for civil rights (NASW Foundation, 2008). Today, the NASW has 145,000 members pledged to work for social and policy change on a variety of fronts, including research, education and advocacy to improve the lives of vulnerable populations (NASW, 2012).

The National Association of Social Workers' (NASW) Code of Ethics preamble (2008) clearly defined the ethical mandates of professional social workers to advocate for, educate and empower vulnerable populations:

The primary mission of the social work profession is to enhance human wellbeing ... with particular attention to the needs and empowerment of people who are vulnerable. ... A historic and defining feature of social work is the profession's focus on individual wellbeing in a social context and the wellbeing of society. ... Social workers promote social justice and social change with and on behalf of ... individuals, families, groups, organizations, and communities. ... Social workers...promote the responsiveness of organizations, communities, and other social institutions to individuals' needs and social problems... . These activities may be in the of direct practice, community organizing, supervision, consultation, administration, advocacy, social and political action, policy development and implementation, education, and research and evaluation. (para. 5-6)

The ethical guidelines the members of the NASW subscribe to suggest a commitment to individual and collective responsibility with particular focus on the most vulnerable. It is logical

to infer from this NASW preamble that social workers have a professional, ethical mandate, as well as a moral obligation to enhance the wellbeing of individuals and society, and therefore of youth who may enlist in military service. Social workers may begin by including the language and brain science relative to this age group in the lexicon of their practice. They must educate, research, and align themselves at the forefront of developing and implementing corrective policy.

### **Individual and Collective Responsibility**

Great minds in philosophy have been articulating issues of individual and collective responsibility, morality and ethics since ancient Greece. They have provided an impetus for individual and collective questioning regarding humans' responsibilities to each other, assisting in the development of the foundation of a society. More recently, others (Feinberg, 1968; Isaacs, 2006, 2011; Kutz, 2002, 2007; Lawson, 2011; May, 1990; Oelofsen, 2008; Vanderheiden, 2004) have contributed to advancing the understanding of individual and collective responsibility.

Feinberg (1968) described a collective aspect of individual and collective responsibility when he stated:

The parties share a common lot insofar as their goods and harms. ... Where there is solidarity there is no hurting one member without hurting them all; and because of the way their interests are related, the successes and satisfactions of one radiate their benefits to the others. (p. 677)

Feinberg eloquently articulated the subtleties of the interconnectedness of the human collective. If one person is hurt the entire collective is affected. A stark example of this is our young soldiers returning home with physical and or emotional injuries. Their injuries become the injuries of the communities and nation they fought for.

In addition to the subtleties of collective interconnectedness, Kutz (2002) introduced participatory conception as an essential aspect of collective citizenship and as an alternate to the concept of an individualistic conception. Kutz stated, “The relation between community and capacity, [includes] our ability and obligation to do together what we must do and cannot do alone” (p. 472). He was critical of purely individualistic theories of obligation and action, as well as purely collective theories. Kutz instead suggested a combination of approaches is necessary to create a “cooperative theory” (pp. 479-481). In addition, Kutz discussed what he believed to be a driving force behind individual and collective inaction when he stated, “So long as I conceive my obligation in purely individualistic terms I have no reason to contribute... .” (p. 478). Since the action of merely one individual in a collective can be inconsequential, Kutz warned that maintaining an individualistic notion “can generalize into no one cooperating” (p. 478) He further stated that vulnerable groups within the collective, “...have a claim on me personally as well as a claim on us” -- the “us” referring to others in the collective who are capable of action. Kutz also spoke of two essential elements of individual and collective participation, “a guarantee of compliance as well as psychological solution that preserves the human face of the claim upon me” (p. 478).

In addition to Kutz’s assertions, Vanderheiden (2004) augmented the theory of individual and collective responsibility, as it related to ethical and moral aspects of addressing climate change. He asserted once a person is made aware of harm, that person has an ethical and moral obligation to act; if one does not act, responsibility and consequences can be imposed for both inaction or harm caused. Vanderheiden took this concept a step further, suggesting a level of common sense is required particularly when it concerns potential harm. He stated, “To fail to foresee (and to avoid) the harmful consequences of one’s acts when a reasonable person would

have done so is negligent” (pp. 148-148). He made the point that once individuals and society become educated about the harmful consequences of behavior and social policy, action is required and inaction would constitute negligence (p.148).

Kutz (2007) also stated, “We can be complicit in others’ wrongs without making a difference to the occurrence of those wrongs” (p. 290). Even if individuals or collective society do not directly participate in wrongdoing, awareness of wrongs coupled with inaction can equal complicity. Oelofsen (2008) discussed the concept of the solidarity model of collective responsibility, in the context of the “Aftermath of apartheid” (p. 340). She stated,

Solidarity denotes cooperation within a community, individuals within the community looking after each other and each others’ interests ... the groups’ goals and purposes are also your own ... the common interests, needs or attitudes of group members provide a basis for action. (p. 345)

Oelofsen (2008) also warned that collective shared interests, goals and attitudes can also lead to harmful as well as beneficial, human actions, apartheid being one example of the former (p. 345).

### **Precautionary Principle**

The United Nations Rio Declaration (1992) principle # 15 focused on environmental protections and first identified the precautionary approach stating,

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (para. 15)

The precautionary approach evolved into the precautionary principle in the Wingspread Statement on the Precautionary Principle (1998). Additionally, the World Commission on the Ethics of Scientific Knowledge and Technology (2005) took the precautionary principle a step further, when they developed specific guidelines for individuals and the collective to enact protections in the face of likely catastrophic consequences, such as environmental damage, global warming and issues of public health.

The precautionary principle was developed as a proactive measure shifting the burden of proof to the likely causes of harms -- i.e., various individuals, businesses and or corporations. Additionally, the developers of the precautionary principle asserted that complete certainty in science is implausible and is not necessary for action, or a sufficient excuse for inaction (pp. 149-151).

The World Commission on the Ethics of Scientific Knowledge and Technology (2005), outlined conditions sufficient to trigger the precautionary principle:

There exist considerable scientific uncertainties or even ignorance about the anticipated harm. ... There exist scenarios (or models) of possible harm that are scientifically reasonable (that is, based on some scientifically plausible reasoning). ... It is currently impossible to reduce the uncertainties without at the same time increasing ignorance of other relevant factors by higher levels of abstraction and idealization. ... The potential harm is indeed sufficiently serious or even irreversible for present or future generations or otherwise morally unacceptable. ... There is a need to act now, since effective counteraction later will be made significantly more difficult or costly at any later time. (p. 49)



Individual countries such as Australia and New Zealand, as well as San Francisco and the United Nations have adopted and evoked the precautionary principle. However, the precautionary principle has been challenged, particularly from the business sector, suggesting it creates inconsistent regulatory decisions (Harding & Fisher, 1999). Additionally there have been concerns that resources would be redirected from known hazards to speculative hazards, that technological advances would be suppressed and that moving the burden of proof to the corporate sector would be too costly (Graham, 2004; Hahn & Sunstein, 2005; Majone, 2002; Peterson, 2006).

### **Micro and Meso Level Ethical Safeguards**

In the following section, safeguards and ethics on a micro and meso level will be addressed. The following is a review of human subject research ethics; its concepts and mandates can be generalized to any entity that holds power, information, and the potential to coerce.

Media exposure of the Tuskegee Syphilis Project (1932-1972) was the primary impetus for developing comprehensive ethical guidelines for the protection of human subjects in research. Four years after the Tuskegee Syphilis Project was discontinued, The Belmont Report (1979) was created to establish ethical principles and guidelines for the protection of human subjects of research. This report established micro and meso level safeguards for the protection of individuals in our society. The Belmont Report offered clear recognition that individuals can be or can become vulnerable for a variety of reasons (e.g., racism, omission or lack of information required to make an informed decision, poverty, and in the case of children and young people, immaturity). The report recognized that medical professionals, researchers and government entities (e.g., the U.S. Department of Health) are often regarded as powerful and trusted entities within U.S. society. In the Belmont Report (1979) three principles were essential

to ethical treatment of human subjects: respect, beneficence and justice (Part B. para.1). The Belmont Report stated,

Respect for persons incorporates ... that individuals should be treated as autonomous agents, and ... persons with diminished autonomy are entitled to protection. ... Respect for the immature ... may require protecting them as they mature. ... Some persons are in need of extensive protection, even to the point of excluding them from activities which may harm them... respect for persons demands that subjects enter into the research voluntarily and with adequate information. ... (Part B. para. 1-6)

Beneficence was defined as, “Persons are treated in an ethical manner not only by respecting their decisions and protecting them from harm, but also by making efforts to secure their well-being... .” (Part B. para. 7-10). Elements of justice were elaborated: “...distinctions based on experience, age, deprivation, competence, merit and position do sometimes constitute criteria justifying differential treatment for certain purposes” (Part B. para. 11-13).

In addition, the Belmont Report (1979) outlined information, comprehension and voluntariness as requirements to informed consent. Information, as related to informed consent was specified in The Belmont Report as “...[information] provided to participants including the purposes, risks and anticipated benefits...and a statement offering the subject the opportunity to ask questions and to withdraw at any time” (Part C. para. 1-3). In The Belmont Report comprehension was defined as, “...a function of intelligence, rationality, maturity and language” (Part C. para. 7). Additionally, the Belmont Report stated, “Investigators are responsible for ascertaining that the subject has comprehended the information. While there is always an obligation to ascertain that the information about risk to subjects is complete and adequately

comprehended, when the risks are more serious, that obligation increases” (Part C. para. 5).

Finally, voluntariness was defined in the Belmont Report as requiring,

...conditions free of coercion and undue influence. Coercion occurs when an overt threat of harm is intentionally presented by one person to another in order to obtain compliance. Undue influence, by contrast, occurs through an offer of an excessive, unwarranted, inappropriate or improper reward or other overture in order to obtain compliance.” (Part C. para. 10)

The Belmont Report also stated, in regard to the concept of voluntariness,

“...inducements that would ordinarily be acceptable may become undue influences if the subject is especially vulnerable” (Part C. para. 10).

History has demonstrated the need for human safeguards such as the precautionary principle and the Belmont Report to protect against conscious and unconscious exploitation of the environment and to assure human well-being.

## **CHAPTER VI**

### **Discussion**

In this final chapter, I will relate developmental and ethical theories to the role of the military, and to the consequences for young adults of participation in combat duty. I will summarize the brain and hormonal research discussed in Chapter III above, suggesting that developmental vulnerabilities in normal 17-24 year olds can directly impact decision-making and likely confound informed consent, particularly in terms of enlisting for combat duty (Weinberger et al., 2005; Forbes & Dahl 2010). Next, I will apply ethical guidelines for social workers, individuals, and the collective society for educating, advocating and intervening on behalf of these young adults. Finally, I will summarize my sense of the implications of this thesis's findings, as well as the findings' limitations, and my recommendations for social work based on the findings, and suggested directions for further research.

#### **Typical Developmental Vulnerabilities of 17-24 Year Olds**

In Chapter III, I presented findings from brain researchers who have concurred that the executive functions of the human brain are not fully developed until approximately 25 years of age (Casey et al., 2000; Johnson et al., 2009; Lenroot & Giedd, 2006). Scientists also suggested that developmental vulnerabilities during this time period lead to inconsistent decision making, a greater sense of danger invulnerability and emotionally based decision making -- likely due to ongoing maturational processes. From adolescence to the mid-20s, the brain is engaged in neuronal pruning, myelination and integration of brain regions and, to a lesser degree, is

impacted by the release of sex hormones and neurotransmitters (Dahl, 2003; Giedd, 2006; Johnson et al., 2009; Weinberger et al., 2005; Winter, 2004).

Developmental researcher Arnett (2007) suggested that on completion of their secondary education, these young adults suddenly experience a lack of structure, independence from parental control, increased expectations to launch from home and pursue a livelihood, or continue on to postsecondary education. In addition, Arnett identified the years between 18 and 25 as a relatively new developmental phase, which he termed “emerging adulthood,” unique to industrialized societies (p.68). According to Arnett, emerging adults are now living at home longer, postponing marriage and children, and experiencing an extended crisis of identity development. Concurrently, brain researchers are concluding this age group is cognitively operating largely from the limbic system (emotionally based decision making) with the additional influence of gonadal hormones, prompting more likely engagement in risky behaviors and adventure seeking (Dahl, 2003; Giedd, 2006; Weinberger et al., 2005; Winter, 2004). Additionally, beginning at puberty, increased neurotransmitters, such as dopamine, engage the prefrontal cortex and reward pathways, reinforcing learning and behavior (Forbes & Dahl, 2011). Furthermore, the limbic system is integrating with the prefrontal cortex and hormones are exerting an effect on emotions (Bribiescas, 2001; Dahl, 2003).

Consequently, 17-24 year olds require ample time and freedom from overbearing authority and traumatic stress to successfully form their own identities and progress to the next milestone of normal development. According to current developmental researchers, typical 17-24 year olds are contending with significant neurophysiological and psychosocial developmental tasks during this time period (Arnett, 2007; Casey et al., 2000; Giedd, 2006; Johnson et al., 2009;

Lenroot & Giedd, 2006). Berzonsky (2010) outlining Erik Erikson's developmental stages stated,

[He] provides a life-span account of psychosocial development that emphasizes the autonomous or conflict-free development of an adaptive ego that organizes experience. He postulates that human beings have a need to categorize and integrate their experiences, as well as a need to satisfy their basic biological needs. A consolidated sense of ego identity—a perceived sense of personal wholeness and 'continuity of experience' — is considered to be necessary for optimal personal functioning. (para. 2)

In addition, this is an important time of neuronal pruning, myelination, and integration of the prefrontal cortex with the limbic system (Johnson et al., 2009).

To summarize, 17-24 year olds are contending with a significant amount of growth and change, which is demanding in itself, without the addition of unnecessary stress, chronic hypervigilance, or traumatic experiences (Arnett, 2007; Casey et al., 2000; Giedd, 2006; Johnson et al., 2009; Lenroot & Giedd, 2006).

### **Ethics and 17-24 Year Old Developmental Vulnerabilities**

In Chapter IV, the ethical and moral responsibilities of professional social workers, individuals, and the collective, in terms of education, advocacy, and intervention were reviewed, relative to vulnerable populations within the collective. Additionally, micro, meso and macro level ethical safeguards, guidelines and principles were discussed, including informed consent and the precautionary principle. According to the NASW Code of Ethics Preamble (2008), professional social workers have a moral and ethical responsibility, inherent in possessing knowledge about potential harms, to act (para. 1-3).

The purpose of ethical guidelines is to monitor actions and provide protections for human beings. Concurring with the NASW preamble (2008) guidelines, social workers have an ethical responsibility to educate the public, underscoring the actual facts about developing young adults, and to advocate for decreasing the potential for the conscious or unconscious exploitation of their decision-making capacities. This engagement extends to young adults' developmental vulnerabilities, particularly as they are recruited for enlistment in the military for combat duty. Subsequent to educating and advocating for this age group, social workers must proceed beyond the mandate, to include informing and instilling the same responsibility and mandate to act within individuals in society and, eventually, the collective.

Additionally, the Belmont Report (1979) was created in response to conscious and unconscious exploitation of vulnerable populations by government entities. The United States Department of Health's participation in the Tuskegee Syphilis Project was the impetus for the Belmont Report. The intent was to provide protections for individuals and communities, particularly human subjects involved in research. These guidelines outline the requirements of informed consent including information, comprehension and voluntariness.

The comprehension and voluntariness aspects of informed consent, as described in the Belmont Report (1979), were central to this thesis. Psychosocial and neurophysiological developmental researchers found that normal development of the 17-24 year old brain involves continued integration of the executive functions with the limbic system, thus influencing decision-making. These important findings document the incompleteness of both of these aspects of brain development in the 17-24 year old group.

## **Implications**

It may be inferred, from the research findings of neurophysiological researchers, that even if the military provided full disclosure of the consequences of combat, incomplete development and integration of the executive functions of the brain, together with a greater sense of danger invulnerability and enticing enlistment benefits, would likely impair full conceptualization of potential consequences among these young men (Forbes & Dahl, 2010; Giedd, 2008; Giedd & Thomas, 2000; Johnson et al., 2009; Weinberger et al., 2005).

The Belmont Report's (1979) definition of informed consent, which is being used for the purpose of this thesis, calls into serious question the practice of military recruitment and enlistment of 17-24 year olds for combat duty (Part C. para. 1-12). Confounding the voluntary aspect of informed consent, the military enlistment benefits may be too enticing to refuse -- such as no-cost training, college tuition, regular income, free medical care, travel, and the intense camaraderie of combat situations, during this developmental time period (Forbes & Dahl, 2010; Weinberger et al., 2005). The report stated, "...inducements that would ordinarily be acceptable may become undue influences if the subject is especially vulnerable" (Part C. para. 10). It is clear that the inducements to military service for vulnerable young persons may be undue enticements indeed.

Some additional factors that may militate against informed consent for 17-24 year olds enlisting for combat duty include military recruiter signing quotas and recruiting advertisements. First, the practice of quotas may interfere with enlistees receiving adequate information of the consequences of combat from recruiters under pressure of quotas. Second, advertisements for recruitment directly target this intense developmental 17-24 year old time period with messages suggesting the military will enhance the lives of individuals beyond their own reach. Other



media include footage of soldiers jumping from military planes, lining the edge of an aircraft carrier, firing tanks, feeding children in foreign countries, and carrying injured civilians. The military promotional materials sell adventure, camaraderie, patriotism, travel and education, while omitting any mention of the potential for long-term emotional and physical disability or death. In these advertisements, the day-to-day reality of living and working in a combat zone is not shown.

In consideration of normal developmental vulnerabilities, as well as aspects of military recruitment that may additionally confound decision making for 17-24 year olds, the precautionary principle is an applicable ethical guideline for their protection relative to their participation in combat duty (Cameron, 2006; UNESCO, 2005; Vanderheiden, 2004). It is reasonable to expect that there will be resistance to the conclusions of top brain scientists. The precautionary principle is designed to initiate immediate protections when an individual or collective action is likely to cause human harm, the risk is potentially catastrophic, and top researchers support the assertion of risk. The precautionary principle, when set into motion, shifts the burden of proof to individuals or entities that are likely causing harm. An example of a collective action causing catastrophic harm is our 17-24 year old males' participation in combat, during a crucial stage in their development. This time period of neuronal pruning, myelination and integration of the prefrontal cortex with other brain regions sets the stage for 17-24 year old males' transition into adulthood -- but that status is far from reached, and the potential for appreciating catastrophic harm likely far from adequately developed. (Cameron, 2006; The World Commission on the Ethics of Scientific Knowledge and Technology, 2005; Vanderheiden, 2004).

I am aware that enlisting in the military for combat duty may seem, for some 17-24 year olds, like a solution to difficult developmental tasks, difficult life situations, and may offer a higher quality of life, or the only way to obtain a college education. However, the experience of combat duty can cause life-long physical and emotional injuries, negatively impacting identity development, individuation, family and intimate relationships, parenting, and employment.

### **Recommendations**

In response to the conclusions of neurophysiological and psychosocial developmental researchers, I believe that we must, as a society, say no to the conscious and unconscious exploitation of our 17-24 year olds, in terms of enlistment for combat duty. As a clinical social worker, having spent most of my professional life working with and advocating for young males, and as a member of the human race, I accept that it is my ethical responsibility to begin the discussion regarding age of insertion into combat duty, toward policy change.

The following recommendations are based on the findings of the top brain researchers discussed at length above, suggesting that the prefrontal cortex (serving executive functions of the brain), responsible for impulse control, attention, emotion regulation, planning and organization, is not fully developed until at least 25 years of age, confounding informed consent (Casey et al., 2000; Giedd, 2008; Johnson et al., 2009; Weinberger et al., 2005).

My main conclusion as a result of doing the research reported in this thesis has been that 17-24 year old males should not be inserted into combat roles, until they are 25 years old at least, based on their vulnerabilities. Instead, if they so choose, I recommend they enlist for non-combat roles, away from the theater of war, until their 25<sup>th</sup> birthday. At their 25<sup>th</sup> birthday, they would be required to reenlist in the military for combat duty. However, I have concerns even with this arrangement, given current basic training tactics, particularly with training this age group not to

question authority, and to prepare for killing, during this time period of identity and brain development and integration: several years of such training could compromise the capacity of even a 25 year old for truly voluntary consent to combat assignment.

I fully expect the recommendation to disallow 17-24 year olds into combat to be hotly debated by many, including those in this age group who want to enlist. Due to the probability of a lengthy debate, I recommend that the military develop strict ethical guidelines for enlistment, in line with the Belmont Report (1979). The creation of this report was a direct result of the blatant exploitation of vulnerable individuals by the U.S. Department of Health, during their management of the Tuskegee Syphilis Project. The Belmont Report's intent was to provide ethical guidelines for the humane treatment of human subjects of medical research by researchers. The report directly addressed ethical guidelines at the micro and meso levels, outlining three basic principles, which must be adhered to, when interacting with potential or current human subjects: respect, beneficence, and justice. Additionally, the Belmont Report defined informed consent as requiring voluntary participation, adequate information about risks, and ability to fully comprehend the information about risks. Also, individuals must be free to withdraw from a research study at any time (Part B. para. 1-13). These protections have not been provided to young military enlistees, but the values of the social work profession clearly call for them to be offered, especially for those most vulnerable. Withdrawal from the military after enlistment is not an option, without serious consequences, until the enlistment period is complete. This makes informed consent even more urgent a priority.

The focus of ethical enlistment practices, in particular, should address comprehension and voluntariness, regarding 17-24 year olds' enlistment for combat duty. The development of ethical guidelines for the military should also include a thorough examination of undue influence

within recruiting practices that may confound voluntary enlistment -- i.e., enlistment benefits, recruiters positioned in high schools, having full access to student contact information by law, as well as directed to become part of students' lives, through coaching and mentoring, while they are recruiting (School Recruiting Handbook, 2-1 & 2-2).

In addition to the recommendations for the military regarding age of insertion into combat and informed consent, as a clinical social worker, my recommendations for other social workers are many. First, clinical social workers treating soldiers as clients should have firsthand knowledge of the potential consequences of war (regardless of age). Brain and trauma researchers are concurring that 17-24 year olds not only have normal developmental vulnerabilities, they are also at greater risk for PTSD, addiction, suicide, and death, when faced with the realities of combat (Dohrenwend, et al., 2008; Preston & Buzzell, 2006). Considering this information from researchers, it is unethical for social workers to wait for our young people to arrive in our offices with debilitating emotional and physical injuries, and not be at the forefront of education and policy change. Also, I would strongly encourage social workers to begin or continue to contribute to research regarding all aspects of 17-24 year olds participating in combat.

I recommend that individuals and U.S. society as a whole become more educated about brain development, and the normal developmental vulnerabilities of 17-24 year olds, and in response, become actively involved in coordinated advocacy efforts focused on policy change. Second, I recommend adopting ethical guidelines, such as the Belmont Report (1979), and the precautionary principle, to provide protections for this age group, due to the high likelihood of physical or emotional injuries, or death, as a result of participating in combat. Finally, individuals can assist in the education of communities and society, helping to bring public

expectations of 17-24 year olds in line with their actual developmental capabilities and the realities of combat.

### **Limitations of the Study and Directions for Further Research**

The limitations of this theoretical thesis include the lack of age specific data, especially regarding rates of Posttraumatic Stress Syndrome (PTSD), addiction, crime, and suicide rates post deployment. Additional limitations of this study include lack of data regarding consequences of combat for women, and non-majority culture persons (most of the psychosocial developmental research has been conducted on white, middle class college students).

In terms of directions for further research, my hope is for the continuation of longitudinal (3 to 30 years) MRI, and fMRI brain research, coupled with research focused on normal development, as well as individual variations in integrated, logical decision making. In addition, I would like to see longitudinal studies examining the consequences of direct combat experience on the developing 17-24 year old brain, spanning enlistment to discharge. An additional direction for further research would be a thorough analysis of 17-24 year olds' integration back into civilian life after combat deployment. Also important for further research would be an in-depth examination of the impact of danger invulnerability on 17-24 year olds' decision-making. Moreover, all research should be conducted on a diverse sample, to include various socioeconomic, racial, and ethnic groups.

In this thesis, first and foremost, I have endeavored to raise the issue of normal neurological, physiological, and psychosocial development of 17-24 year olds, while at the same time, making the point that this normal developmental process creates temporary but significant vulnerabilities, particularly as they relate to participation in combat duty. My hope has been to increase the discussion of these issues, as well as prompt additional research.

Furthermore, my intention was to raise the question of the ethical responsibility of professional social workers, individuals, and the collective, for educating, advocating, and intervening on the part of our young adults, as well as encouraging them to begin advocating for their own well-being.

I did *not* intend, however, to disrespect, dishonor, or in any way suggest that 17-24 year olds are defective; they are merely human beings undergoing maturation, which I believe should be allowed to be completed. Far from considering them defective, I hold young adults in high regard and acknowledge their value to their families, their communities, and the greater collective. They are our future. Finally, I want to acknowledge the ultimate risk and sacrifice many in this age group have already made, and are currently making on the battlefield.

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