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Using Nano Technologies and Neuroscience Technologies in Combating Terrorism

Aşkın İnci SÖKMEN ALACA

Introduction

The revolutionary developments in information technology in the century we live also enabled high-level development of robot technology, space technology, Nano technology, biotechnology as well as advanced technologies in neuroscience. Technological innovations in these domains have taken place in the army weapons of the countries, in their security and defense systems and caused a change in the nature of wars. Modern warfare is as much as possible less based on using military units and more on using smart weapons. In several armies of the world scientists (physics, chemistry, biology, computer, neuroscience, genetics, etc.) and engineers, through university-army cooperation, private and state owned companies produce solutions in matters related to armed conflicts, counter-terrorism, and war.

Counterterrorism is a strategic management process realized by state entities in the framework of short, medium and long term plans and strategies to be created by correctly defining the causes, ideology, belief, and ideas of terror at national and international level. A national strategic fight includes the processes of planning, organizing, conducting and controlling all preventive strategies with a contemporary and integrated approach. These policies cover corporate structuring (security forces, intelligence organizations and other institutions that are responsible for counterterrorism), legislative regulations, efforts aimed at the international area, and social, economic, politic and cultural domains. The final goal is to save lives by preventing terrorist attacks or to decrease their numbers.

Counterterrorism is conducted in two main lines as methods that either require or do not require the use of armed forces. In the use of force, the attacks realized to targets related to terrorists by the military and police units assigned by the state in fighting with terror, their clashes with the terrorists are operations that occur both within the country and on the territories of foreign countries supporting terrorists. Unarmed fight methods include to prevent and counter terrorist attacks without resorting to military options, intelligence, economic sanctions for those who support terrorism, solving peacefully through dialogue problems that terrorists are fighting for and legal penalization enabling to punish terrorist actions. While these methods are put into practice simultaneously, as primary criteria, the state has to be the active part which holds the initiative in creating the policies for fighting terrorism and solving the terror problem.

Combating terrorism is a synthesis of multidisciplinary works involving especially sociology, anthropology, business administration, psychology, economy, management sciences and political sciences from the branches of social sciences. Based on these disciplines, new technological developments, especially Informatics, robots, and nanotechnologies as well as neuroscience studies have become disciplines from which the state can draw benefit in its fight against terrorism. This study shall dwell upon facilities that nanotechnology might bring to the operations requiring armed forces, and upon neuroscience research in the domain of fight which does not require forces.

1. Terrorism

Unlimited by a particular region or a particular state, with impacts and consequences that extend beyond a certain area, terrorism is one of the most important security issues targeting the stability of nation states and the international community. Terrorism has appeared as a new

method of warfare in today's world. An efficient and permanent way of fighting terror, also called "Low-intensity war," which shall completely erase it from the world has unfortunately not yet been found. While a consensus cannot be reached yet on the definition of terrorism, the covert support given by states to terror organizations makes the fight all the more difficult.

An effort is being made to make a multidimensional definition of terrorism on a vast scale. For instance, as much as there are views that strive to explain all acts of violence with the concept of terrorism, there are opinions which do not consider revolutionist insurrections in the scope of terrorist activities. Each country, each political formation or ideology have assigned to the concept of terror a meaning an expression that will facilitate to achieve their goals. In brief, there is a conceptual confusion such as "one's terrorist is the other's freedom fighter." Terrorism can be seen as a destabilizing violent crime (Wilkinson 2001); an international policy and a new way of making war (Freedman 2001); a communication tool aimed at giving messages to the society or a violent strategy implemented for different causes (Merari, 1993). As states make definitions according to their national interests, a double standard can be observed in most of the cases. Terrorist organizations that realize terror attacks under the protection of states become the tool of an ongoing fight between the states henceforth. (Ganor, 1998:22-23)

The Dutch Political Scientist Alex P.Schmid has determined 140 definitions on terrorism, and they contain 20 common purposes. The five principal elements that are most frequently mentioned are the use of violence or force, the presence of a political aim, inflicting terror and fear, threatening, the psychological effect it produces in the society. The five aims that are most mentioned are to scare the people or the target mass, to destroy the vested authority, to mobilize forces that are against authority or order, to influence the public opinion positively or negatively and to capture political power groups. (Schmid, 2011: 74) According to the definitions made by experts on terrorism; Walter Lacquer defines terrorism as "acts of violence that organized groups in general aim at selected targets to achieve their political purposes"; Bruce Hoffman states (1998: 40) "terrorism is ineluctably political in aims, threatens violence, designated to have far reaching psychological repercussions beyond the immediate victim or target and conducted either by an organization with an identifiable chain of command or by individuals directly influenced, motivated by the ideological aims and perpetrated by a subnational group or no state entity "; whereas according to Brian Jenkins is " the calculated use of force or threat to use force to achieve political change"; Ted Gurr (1989: 201) has defined it as " the use of unexpected violence to intimidate or coerce people in the pursuit of political or social objectives ".

To designate an act of violence as terrorism, it has to consist of three main factors as ideology, organization, and action. As a symbolic action shaped to have an impact on political behaviors through unusual ways such as a use of violence or the threat of violence, ideology is the most important factor in terrorism. Embodying belief, value judgments and objectives ideology provides the most important function in legitimizing the acts. It has a substantial impact which can turn an ordinary act of violence to terrorism. The ideology of an organization almost defines the identity of that organization. In setting up the organization, in recruiting militants, creating sympathizers, in achieving commitment and acts the most important factor is its ideology. The ultimate aim of each terrorist organization is to establish an adequate political order. Terror organizations realize their terror acts by taking as reference ethnic, religious or left wing ideologies. Behind every terrorist act of violence, there is an ideology, belief system to which the terrorists dedicate themselves. Such systems are extremist factors which are in principle qualified as intolerant. Extremists are persons who are intolerant towards opposing views and are the most important motivation source for terrorist acts. A basic typology of terrorism is religious groups; ethnic-nationalist, separatists and irredentists groups; racists and right wing groups; anarchists and left wing groups; criminal organizations with terrorist tactics and lone wolf. (Schmid, 2011:6)

In the 19th century and throughout much of the 20th-century terrorist ideologies were various socio-revolutionary, anarchist and left wing. At the beginning of 21st century, radical nationalism and religious extremism had emerged as the most influential ideological views for terrorists. Radical ethnic-nationalism with separatist aims was rarely tied to left-wing ideology. Nowadays, the most frequently seen is international terrorism, cross border terrorist acts of a global scale committed by Islamist extremists. Stepanova has qualified this type of terror acts as *Superterrorism*. Superterrorism ultimately pursues existential, non-negotiable, global and in this sense unlimited goals—such as that of challenging and changing the entire world order, as in the case of al-Qaeda and the broader, post-al-Qaeda transnational violent Islamist movement. (Stepanova, 2008: 11) The recent terrorist activities that are also called New Terrorism consist of a loose cell based network structure which is difficult to detect, terrorist cells in more than one country, intense propaganda activities through information technology especially the internet, terrorist groups with a religious reference that ask for a change of order and challenge the global community. (Martin, 2017: 65-66)

Among the primary targets of terror, changing the existing political order, polarization, destabilizing the society by creating psychological fear among the people and delegitimizing the current government for not having taken necessary measures, preparing a suitable environment for revolution exist. Terrorist movements (such as secessionist, separatist) are acts of violence aimed at disrupting the orientation of the state within the society. It includes politically motivated actions that create fear, anxiety in the public, demolishing fundamental moral values that sustain the community. It tries to create a disproportionate impact with a symbolic act. As a result of the impact created it aims to reveal its own alternative. Through propaganda, it tries to recruit sympathizers from the public for the organization's acts. The errors made by the security forces during the fight against terrorism create significant opportunities for terrorist organizations for having their views adopted. In brief, a terrorist campaign is escalating failing governance, growing animosity towards a state or society, increased the ability to control territory as declining in state function in the area of terrorist operation, a radicalization of a constituency, with the terrorist groups becoming the only viable form of political expression.

2. Fight against Terrorism

Combating terrorism is a process. It is a threat to the country it impacts, to the national unity and national integrity and the stability. This threat may also acquire an international nature due to the transnational character of the terror organization's ideology; it's being supported by foreign countries. Terrorism has various reasons, such as economic, social, legal, and political. On the causes of terrorist organizations Tore Bjorgo and his colleague Dipak Gupta have studied existing terror organizations and have noted 14 preconditions and percipients of non-state terrorism. These are lack of democracy, civil liberties and the rule of law; failed or weak states, rapid modernization, extremist ideologies, revenge of historical roots of political violence, civil wars and revolutions; inequality of power; illegitimate or corrupt governments; external actors to disorientate the state stability; repression by foreign occupation, and colonial Powers; discrimination of ethnic and religious groups; failure or unwillingness by the state to integrate dissidents group; social injustice; strong ideological charismatic leader for terrorist organization and triggering events. (Gupta, 2005: 16-33) Understanding the fundamental causes of terrorism and determination of the factors leading individuals or groups to become terrorists, provide the opportunity develop strategies to fight against terrorism.

The ever changing hyper dynamic structures of terror organizations that continuously undergo changes and renew themselves in time both from subjective and objective perspectives make preventive sanctions in fighting terrorism harder to implement. The organizational

structures of the terrorist organizations today, due to their network organizations of global nature that spread to the whole world and their secret cells have become quite difficult to solve. (Laqueur, 2003: 8-9) Matters such as who should be fought as a terrorist and how it will be fought remain currently uncertain. Moreover, terrorist organizations can make use of the developments observed in the communications and transportation technologies today. (Crenshaw 2016; Crenshaw and Lafree, 2017)

Terrorism specialists have determined in the subject of a fight against terrorism, the ten most frequently countermeasures as being effective against domestic terrorism in the issue of the fight against terrorism. These are information collection in the terrorist organization, intelligence sharing and collective action with other states concerning the terrorist organization, terminating the terrorist organization's financial resources, in the foreign policy of the country pursuing the fight against terror with determination, preventing the terror group's propaganda through the media and the internet; providing continuous information to the public on the terrorist organization and to create channels through which they can report, to support countries that are insufficient in their fight against terror, to ensure borders- airport and sea transportation safety through military cooperation and joint operations. Among these methods, it is seen that intelligence gathering, infiltration to the terrorist organization, destroying the terrorist organization from within seem to have a primary importance. (Schmid, 2011:29) The biggest intelligence failure in terrorism is considered to be the attacks of September 11, 2001, which could not be detected beforehand.

In addition to these 10 principal methods of fight, some other countermeasures are ; deterrence, public support and involvement (especially winning hearts and minds), solving root causes (demonstrations of good governance and fairness or strengthening of the stat), international state building in failed or weak states, arrest of key members of terrorist organizations (or targeted assassinations and the death penalty for terrorist activities), international alliances on terror, support for democracy for antidemocratic regimes, making International Criminal Court more proactive, strengthening anti -proliferation measures and targeted killing of terrorists. As the terrorist acts of the recent periods are based on a religious reference, measures related to the regulation of religious schools, religious clergy and meeting places, prohibiting external actors to define a spiritual and political life of communities, neutralizing extreme indoctrination with an isolation of radicals have become important. After the terror attacks in Paris in 2016, keeping immigrants under continuous control for the risk of being involved in terrorist activities, assimilation of immigrants have been added a to the methods of combat against terrorism. (Schmid, 2011: 30-31 ;)

Ronald Crelinsten has asserted that the fight against terrorism should be made in 5 manners, by combining hard and soft power approaches and by coercive, proactive, persuasive, defensive and long term counter terrorism. Coercive approach as well as criminal justice and war models are important. In the criminal justice model, terrorism is a crime and foresees to punish terrorists with the anti-terrorism law. The model of war consists of military and paramilitary operations to the terrorist groups, to the areas where terrorists are based and their support elements. It relies on the state's monopoly on the use of violence and the exercise of hard power. The primary purposes of these operations are to eliminate the means of terrorist movements to use terrorism to attack the country's interests. They are performed as domestic and international operations. Proactive counterterrorism means preventing terrorists from acting. It deals with intelligence gathering, slashing their financial resources, arresting and killing terrorists. Intelligence is the principal element of proactive counterterrorism. At the same time, it includes the determination by the state of all policies such as criminal law, policing, intelligence, finance, border control, immigration and refugee policy, military strategy and tactics, diplomacy, economic development

with the purpose of fighting with terror. Persuasive counterterrorism includes offensive psychological operations and propaganda aimed at the terrorist organization and their followers. The goal is to win the hearts and the minds through the method of perception and to prevent acts of terror from finding a base. It consists of preventing terrorists from being motivated by revenge, retaliation, martyrdom deriving from the past and demonstrates that their actions are pointless. In defensive counterterrorism, the state must minimize the risk and the damage of such a terrorist attack. A terrorist attack is a symbol of the terrorists 'ability to strike anywhere, at any time in spite of security forces. There are three primary prevention: target hardening (to make government officials and government buildings, military bases targets less attractive or more difficult to attack), critical infrastructure protection including securitization energy, water, oil supplies and urban transport and monitoring and regulating (border control) the flow people (immigrants and refugees), money (terrorism financing) and goods (illegal arms trade). In the long term, counterterrorism would mean prevention, preparedness, quick and efficient response and reverting to an environment where terror acts are difficult to commit and unattractive. To eradicate terrorism in the long term, it is necessary to know the causes of terrorism and to find a solution to them. (Crelisten, 2009, 2014)

Each country which is subject to terror attacks is trying to bring down its national security issues caused by terrorism to a controllable level by implementing hard and soft power measures. A straightforward and unique solution to terrorism does not exist. Failing to apply the correct strategy may result in the terrorist organization's success in the long term. (Acting too late in the military intervention to the Islamic State of Iraq and the Levant (Daesh) has led to increase their control of the lands in Iraq and Syria) (Arreguin-Toft, 2001:96) While terrorist organizations of different ideologies copy each other on tactics and acts, examples from countries that are successful in the fight against terrorism can be guiding for countries that are facing the problem of terrorism in their struggle. In addition to technology, studies in various disciplines can increase the means of the state in the fight against terrorism. On this subject, the innovations that studies on nanotechnology and neuroscience may bring to the fight against terrorism shall be touched upon in the following chapters.

3. Nanotechnology and Counterterrorism

In the approach that considers the counterterrorism as a war model, the domestic and international operations performed by special security forces determined by the state targeting terrorist organizations are meant. In a war model of counterterrorism, the success indicator is defined by victory or defeat. In a zero sum clash where only a single party shall be victorious, the success of the state's armed forces consists of making the bases, terrorists and their instigators ineffective. The central element of war model is the use of maximal force, designed to overpower the enemy. In the war on terror, the developments in nanotechnology provide valuable opportunities in preventing the losses of security forces and in destroying targeted terror bases. It offers to replace the human in many dangerous warfighting missions such as unmanned surveillance system and uninhabited combat vehicles. At the same time it has become one of the critical technologies for homeland security in the protection of strategic government and security buildings, in the detection of explosives in the cities, in protecting the cities and civilians against biologic and radiologic weapons (threat awareness) (Kosal, 2009:43-52; Ratner& Ratner, 2004)

Nanotechnology derives its name from a nanometer, a billionth of a meter. It deals with structures the sizes of which are between about 0.1 nm (single atom) and about 100nm (large molecule) It includes works such as processing, measuring, modeling and organizing at dimensions smaller than 100 nanometers. In other words, controls over material at atomic, molecular and supramolecular levels are ensured through nanotechnology. (Drexler, 1986) As

materials behaved differently from the macro world at the Nano dimension, this technology became important. Especially molecular nanotechnology which ensures that larger systems are controlled by producing systems at molecular dimensions has created new opportunities in mobile Nano-robots, merging human and robots, brain studies (Nano robots in neurons to sense or control, readout of brain contents, evocation of thoughts, downloading of brain contents to software, brain implants to expand memory, thinking, and feeling and for communication). (Altman, 2006: 27-28)

In the military domain, nanotechnology has a recognized defensive military capability. Research and developments in nanotechnology provide to the armed forces with new and advanced materials, defensive and offensive weapons and to reduce the risk for the warfighter. It enables applications in electronics, optoelectronics, and information and communication systems for detecting, preventing and deterring bioterrorism. Developing weapons based on this technology ensures that both soldiers, as well as vehicles, have an armor system which enables them to continue fighting without being subject to any damage. As new arms, it has become possible to manufacture by nanotechnology chemical and biological weapons and to send them to hostile targets by Nano robot bugs. Russia has already been developed a non-nuclear weapon with the use of nanotechnology as called "Father of All Bombs" (Neve, p.7).

It has become possible to avoid being damaged by military vehicles (land-sea-air) by using armor plates made of ceramic, alumina ballistic, calcium, boron carbide. In the framework of smart uniforms that provide high security to soldiers, inflammable military uniforms resistant to high temperatures or that make soldiers invisible for camouflage purposes were created. (Anadolu Agency, 2014) These garments have chemical, biological and nuclear detection systems which issue a warning when targeted even by a laser gun. The steel vests weighing 300 gram capable of absorbing 200 bullets have also improved the defense of soldiers. (Fox TV, 2015) Through the Nano health sensors on the soldiers' uniforms the health information of the soldiers are sent to the operation base, and thus continuous monitoring was facilitated. The soldiers' wearing multi-functional light uniforms at the operation area during an armed fight as well as carrying lighter equipment and arms have increased their fighting force. Infiltration without being seen by the terrorist organizations (even by night vision glasses), intelligence gathering and neutralization have become easier. (TRT News, 2014) Particularly in operations abroad, the equipment of the soldiers has been redesigned to make them more rapid and powerful with the polymer Nano composite framework or made by Nano fibers, protected against biological and chemical weapons with chips (RFID labels) that enable them to be located by their boots. (Twari, 2012:827)

Small robot animals produced with inspiration from the animals in the nature with the help of Nano technology and robotic technology (Snake robots, robot-bees, rat-bot, robo-ants, robotic spider, humming bird etc.) eliminate the ability of terrorists to hide and act in the underground tunnels in the country and tunnels and sewer pipes in the city (their feature of being the easiest area in escaping to escape from face screening programs placed in the cities). (Drake, 2013) On screening, image taking, monitoring, and detection Nano robot animals provide great benefit. (Azonano, 2008) In the robot fly model developed by American the Defense Advanced Research Projects Agency (DARPA), by placing night vision cameras, it is possible to make necessary controls and collect intelligence aimed at explosives, the presence of terrorists in tunnels and passages, in cell houses. (Shadbolt, 2015) The American army has checked with four- or more legged walking robotic pack mules to shoebox-sized robots the interior of caves in Afghanistan and the interior of cars in Iraq to find whether there was any bomb set-up. (Wilson, 2011) To view the interior of a newly dug tunnel or to monitor a cell house the Mosquito Spy Drone can be used to collect intelligence. (The Drudge Report, 2016) While the flying robots manufactured by the British model according to the dragonfly can gather intelligence in the settlement areas of

terrorists and indoor spaces, they can detect chemical weapons in advance. (Brown, 2016) The Gravity Sensing Systems developed in the framework of the Greenglow project developed by the British viewing the enemy's tunnels, and underground arsenal has been designed to detect terrorists that use underground tunnels in Syria and Iraq. (Farmer, 2016) While drones fly on terror areas to collect intelligence, terrorists prefer underground tunnels to avoid being spotted out. During the Vietnam War, the Vietcongs used underground tunnels made according to their body build as shelter, arsenal, and base and have realized their attacks in different places by coming out of the tunnels they built. In our country, extending from the administrative district of Mardin to Qamishli district in Syria a tunnel made with the purpose of providing human and arms support and to hide the explosives belonging to the terrorist organization The Kurdistan Workers Party's (PKK) Syrian branch, Democratic Union Party (PYD) has been found. (Sabah, 2016) In the fight against terror, during the curfew in the administrative district of Sur of Diyarbakır, terrorists have tried to escape by using the ancient tunnels under the city. (Haberler, 2016) Nowadays, discovering the underground tunnels used by many terrorist organizations has a critical importance in the provision of country's security.

It does not seem possible to point shoot with bombs using drones with the aim to neutralize terrorists hiding in the houses of a city. As houses are in next order, it may cause the death of civilians who have to stay in their homes during the curfew. In the movie *Eye on the Sky* by the Film Director Gavin Hood, bringing forward the damage given to the surroundings by an air attack made to a house where a suicide bomber has been detected, tried to demonstrate how difficult is the decision making process. Therefore the operations of security forces targeting homes have priority. Systems have been developed to view beyond walls, enabling to detect between the floors the flats where terrorists are present. With the WI FI camera adaptable to the cellular phone developed by the Massachusetts Technology Institute (MIT) Computer Sciences and Artificial Intelligence laboratory it is possible to detect human elements that are indoors. (Demircan, 2015) With "Beyond Wall Target Detection Radar" (DAR) developed by the Turkish engineers, it will be possible to neutralize terrorists located in buildings within the city. (TRT Haber, 2016) Especially in the operations aimed at rescuing civilians taken as the hostage by terrorists, after detecting the location of the target in the building, micro weapons or anesthetics which can be placed on robot flies shall facilitate the neutralization of terrorists without requiring security forces to enter the location. In the complicated operation phases that include fine details, the micro sized Nano robots equipped with cameras and weapons facilitate the work of security forces to totally avoid civil losses.

In clashes, securities forces shall be able to shoot with clusters of bullets from great distances to "pin" people to a Wall or freeze their physical movement through Nano diameter needles. These Nano needles are invisible to human eye and non-lethal weapons. Without no permanent damage, it will provide arrest terrorists easily. (Tiwari, 2012: 829) Most people think of poison as a tool for killing tool, but NT, with its ability to trigger specific brain functions, will provide a whole new menu of poison options.) In nanotechnology, especially together with neuroscience, with the aim of collecting from the terrorists in prisons the information on the terrorist organization and concerning future terror attacks it will be possible to make someone tell the truth without torture but by using a liar poison created by using nanotechnology. At the same time, a frontal lobotomy poison that will make a person incapable of being angry or mean is possible. Especially, in operations undertaken at cell houses where terrorists are found or in their bases, using the frontal lobotomy position shall provide facility to the security forces in neutralizing them. It became possible to neutralize enemies at targeted locations by transporting such poisons via Nano robot mosquitoes or Nano drones. The Russian newspaper Pravda has claimed that the USA had allegedly succeeded to eliminate the leader of Venezuela Hugo Chavez and the brother of the North Korean Leader Kim Yong Un by such Nano weapons. (Bafou, 2013) It has made such claims

by The Pentagon's Defense Threat Reduction Agency report dated 2010 stating the opinion that transgenic insects could deliver protein based biological warfare agents to be used offensively against targets in a foreign country "(Daniels, 2017). Such assassinations which can be made in this style to terror organizations' leaders have facilitated the covert operations made abroad. Developed Nano Mind Erasers, provide the possibility to neutralize a person's memory. Tiny bursts of Nano dust would wipe sections of a person's brain clean without the victim ever noticing, creating an instant Alzheimer's condition. These are among the methods that may be used in prisons on terrorist leaders who have been captured, on ideologists of terrorist organizations with religious motivation to erase what they have done and planned (Frey, 2008).

4. Neuroscience and Countering Terrorism

The studies performed on the brain and nervous systems which are the primary domain of neuroscience have acquired importance in the military field as well. As a dual use technology, it enables the use at a later stage for military purposes the works that are carried out initially for civilians. (Moreno, 2006: 41) It is possible to use it to increase the capacity of soldiers (such as fighting for an extended period, courage) as well as to collect intelligence, to wipe-out the enemy's capacity to fight, to direct the behavior of masses in psychological operations and to make them surrender without fighting. (The Royal Society, 2012 : 5-7) In this domain where Russians display an efficient work since the Cold War, several countries such as the USA, China, and Iran continue to develop neuroscience technologies that may be used in preventing national security threats.

Especially cognitive neuroscience which explains psychological and physiological processes underlying human information processing, emotion, motivation, social influence, and development is by such studies. In addition to Neurotechnology, the studies on cognitive neuroscience have resulted in neurotechnology devices (functional neuroimaging), Neuropsychopharmacology (weaponization of variety neuro-pharmacologic agents), neural systems modeling and human- machine interactive networks in intelligence (NEURINT neural intelligence) which can be evaluated from the perspective of security.

Neuroimaging machines such as the functional magnetic resonance imaging (fMRI) scanner present the opportunity to peer into how people think and to learn what they are thinking. It can primarily provide information on how political ideologies that are related to the terror discipline (for instance the anterior cingulate cortex can be correlated with inclinations towards liberalism (Kanai, Feilden, Firth and Rees, 2016) and the emotions (such as friendship, compassion, anger, fright) related to the amygdala which is in the limbic system situated in the midsection of the brain's frontal part affect the decision making in the brain. (Fields, 2016) Understanding the mind of a terrorist is important for the formulation of effective counter terrorism strategies. Neuroscientific tools were used primarily to collect information on the arrested terrorists. This subject it is based on the studies of Daniel Langleben using fMRI device in the identification of the truth and the lie through cognitive differences (Langleben, 2008). The American government has used neuroimaging Technologies for lie detection in its interrogation techniques for terrorists. (Marks, 2007: 486) Certain interrogation techniques being humiliating or violent becomes a fact which can be used for revenge or collect sympathizers. Long detainment periods enable terror organizations to look after their families and recruit new members and to strengthen their commitment to the organization. In the Syrian civil war, some of the foreign warriors consist of prisoners freed from prisons in Iran and Afghanistan. It has been claimed that the members of the DAESH terror organization are those who have been released from the American prison in Iraq. The terrorist organization HAMAS which controls Gaza was founded by Palestinian prisoners held in the jails of Israel. Philip Zimbardo's (1971) Stanford Prison experience is one of the important studies demonstrating the effects of the prison systems on this subject. The EU,

with an approach aiming to hold human rights at the forefront, is not returning terrorists for the reason that they would be subject to violence in the countries to which they will be extradited and judges with a penal approach to leave them under arrest. However dissolving cellular terror organizations and acquiring information on their acts without having recourse to violence (torture) during interrogations is possible through neuroscience and nanotechnology tools.

There is a widespread assumption that group, organizational and social psychology, with a particular emphasis on 'collective identity' provides the most effective framework for understanding terrorist psychology and behavior. (Post, 2007: 4) John Horgan in his recent book (2005), *The Psychology of Terrorism* has emphasized that there are no individual psychological traits that distinguish terrorists from the general population. The roles of leaders of the terrorist groups are significant in creating dominant terrorist psychology. They send religious, political or ideological justification message and alienated individuals (terrorist sympathizers) into an organization. A study supporting this work has been realized by neuroscientists. Neuroscientists have identified that the neurocircuitry of tribal behavior that separates "us" from "them" occurs in the prefrontal cortex. However, they have determined that the distinction between 'us' and 'them' is not inherent, that it was achieved by the orientation of divisive leaders. (Rodhan, 2016) As a consequence, in countering terrorism, the organization leaders and their abettors are the persons who should be neutralized. As the same time, fundamental religious beliefs called also "sacred values," core constructs of national and ethnic identities and moral norms, motivate many prominent individuals and group decisions in life and disagreements over sacred values also contribute to many political and military conflicts and may also underlie some acts of political violence. Thus, understanding how sacred values are represented and processed in the human mind has far-reaching implications for policymakers. The researchers found that sacred values thinking activated the amygdala, the emotional center of the brain (Eisen, 2012). In the programs to fight radicalism extremism, training prepared according to sacred values based on educational neuroscience may become one of the effective programs in protecting children in the long term from terrorist organizations and in changing their mindscapes.

The leaders of terrorist organizations condition their militants in the long term by continuously emphasizing the same words when they talk. Especially terrorist organizations with the religious reference can convince terror members through video messages. At this point, as Freud attached importance, by addressing to the subliminal, it becomes possible to direct the thought or act of listeners (militants) through a visual (25th frame effect) or an audio effect. Pratkanis and Aronson (2001) in their book *Age of Propaganda* have propounded that subliminal persuasion messages could be sufficient to lead a nation to war. In the domain of neuromarketing, it has been demonstrated how consumer behaviors could be directed through subliminal incentives. (Lindstrom, 2009) Controlling and directing the human brain have been seen as an efficient weapon aimed the minds of hostile targets especially in psychological war. Not only aimed at enemies, mind control methods have been used to raise spies and assassins during wartimes (for ex. Project Bluebird Chaitkin, 1994). When we see terrorism as a war between states, there is always a possibility that the terrorist organizations' members might be trained in these programs. Jim Keith (1997: 79, 247), in his book *Mind Control Word Control*, has mentioned the Mind Control Ultra (MKUltra) of the Central Intelligence Agency (CIA) and the High-Frequency Active Auroral Research Program (HAARP) Projects. Designed by inspiration from the Russia's studies on mind control HAARP is broadcasting at the same frequency as the human brain and can direct the minds of nations.

At the Psychotechnology Research Institute founded in Moscow by the Russian scientist Igor Smirnov, studies have been made to change human behaviors by sending subliminal messages (Weinberger, 2007). With the help of a generator (a nervous generator system) that he developed

and named "psychotropic weapon (Russian term for mind control weapons)" he has demonstrated that he could send electromagnetic waves through telephone lines, TV and radio networks and impact behaviors. The essence of the system consists of the fact that subliminal sounds could alter a person's behavior. These methods have been tried upon mujtahids in Afghanistan. At the same time, "psy" weaponry systems have been said to provide opportunities for psychokinesis studies which enable distant mind reading, telepathy, telekinesis and intervention at tactical or strategic level upon the individual's mind. (Chernisev, 1997; Thomas 1998) Woodpecker signals, i.e., microwave bombing was used on the American Embassy in Moscow to direct the behaviors of the consulate workers. (Time, 1976) Nowadays the cellular phone band is the same as the band which through which it is possible to affect the human brain. The person who discovered this band, Wilhelm Reich as a scientist who works in the CIA, points out that cell phone signals are effective tools in directing human behavior. (Adachi, 2006) The ex-British Intelligence MI5 member physician Barrie Tower has declared that the mind control method he named mini wave wars could be realized by using the cell phone and WI-FI signals. He has indicated that the targeted person's brain could be programmed unaware and used for the desired purposes. (Mind Tech Sweden, 2012) The movie *Kingsman: The Secret Service* (2015) made by the Director Matthew Vaughn, shows how a business person followed by the British Intelligence could create chaos in the world. This chaos situation, by stimulating a particular section of the brain with extremely low frequency (ELF) made the person nervous and unconsciously aggressive. If this method is tried on a terrorist, the terrorist may perform an armed attack in the cell house where the terrorist is or in the terror camp and may neutralize the hostile targets through executions within the terrorist organization. Qualified as "valuable asset" in the domain of intelligence, it has become possible with the latest chip technology (invisible Nano chips) which can be injected in normal life or in prison to use for these purposes the terrorists who can eliminate the threats as long as they spy the terror organization. When we think of military operations as a last resort, while risks are minimized by eliminating terror targets, continuous clashes may end the revengeful continuity of terror attacks.

The exact contrary of inducing aggressiveness has been realized by the Spanish Dr. Jose M. R. Delgado. Delgado (1969) implanted a set of radio controlled electrodes in a bull's brain, and with this system was able to soothe the bull. The possibility to manipulate behaviors by procuring an electric current has provided the opportunity to develop nonlethal neuro weapons to suppress insurrections and other mass disturbances. In the civil warmongering scenarios of ethnic based terror organizations, it is possible for security forces to prevent mass movements without entering into a spiraling violence. The USA has used nonlethal sensors to protesters in Iraq to quell mass disturbances without bloodshed (Bender, 2005). In the MEDUSA (Mob Excess Deterrent Using Silent Audio) project designed by the American Navy, the non-lethal microwave weapon which cannot be perceived subconsciously has been developed to control masses by noise (Hambling, 2008).

Neuroweapons developed for defense purposes especially the nonlethal gas was observed to be efficient in irregular wars. The principal function of these weapons is to affect the nervous systems of humans and produce cognitive, emotional and capability changes. (Wurzman and Giardona, 2015: 81) In this subject, the example of Russia is given when in 2002 when hostages were taken in Moscow theatre by 40 Chechen terrorists when it used at the operation the aerosol version of carfentanyl (a form of fentanyl). Although the gas made everybody sleep, from more than 800 hostages, 120 were poisoned and died from the gas. Fentanyl also are ideal tools for assassination as they are lethal and leave no trace. The Secret Service of Israel MOSSAD has attempted to assassinate Hamas Leader Khaled Mashaal in Jordan with this gas. (South China Morning Post, 2016) In terror acts committed this year in Europe, while terrorists are killed during the terror attacks the live no clue on who were those who planned these attacks. Although

ISIS leaders are said to be killed during air raids, it is still unclear why these acts are continuing why these capitals are chosen. A terrorist who is caught alive is likely to provide important information. At this point, using neuroweapon that cause faint can become an alternative to find the terrorists alive without doing any harm to the civilians around.

From the perspective of military power, studies on neural systems modeling and human-interactive machine networks have given the opportunity to develop soldiers that are a mixture of man and machine (bionic or robotic) called cyborgs (cybernetic organism). The primary purpose here is to create courageous and successful warrior soldiers. The system is based on transforming soldiers into cyborgs with an implantable chip. With the Neural Engineering System Design developed by DARPA data transfer between the human brain and the computer shall become possible. (Cuthbertson, 2016) It will transfer to the brain the map of the region where the hostile forces are, their war capacity. These chips which can be implanted to soldiers who are fighting against terrorism show that as it was indicated previously that the mind control of terrorists through chips should be possible to these studies.

Controlling objects by a power of thought has become possible with the communication between the human brain and the computer. These systems aimed at facilitating the lives of paralyzed and disabled persons shall turn into a supporting element that will facilitate the war capacity by moving objects through the power of thought in war zones. A scene in the movie *Valerian and the City of a Thousand Planets* (2017) Directed by Luc Benson shows that movements can be controlled by a device worn on the head or with a chip sent to an enemy which is close by. It is important from the perspective of showing how important this can be in operations as the enemy soldier acts exactly like the person who is wearing the device. In the framework of dual use technology, it becomes possible for the individuals who wear neuro prosthesis eyeglasses to transfer their thought to the computer. (Serap, 2016) Newly developed technologies show that we can read the mind and learn the ideas. It has become possible to collect intelligence by only observing terrorists that are detained and let to be used devices that enable us to read their minds.

These studies on transferring human consciousness after death to a computer (artificial intelligence environment) or to another body. The movies *Transcendence* (2014) with Johnny Depp as the actor and *Criminal* (2016) with Kevin Costner as the actor, show that these studies are possible. These studies may be important in learning in the last four days of a terrorist before he died. With technology to be developed, it shall be possible to transfer the images that the mind has recorded to become prepared for terrorist attacks and the images of other militants can also be assessed thus. After Einstein's death, his brain was studied, and it was discovered why he was so intelligent. Furthermore, in the case of serial killers who have been killed the factors causing them to commit such crimes and their difference from a healthy normal brain have been discovered by mapping their brains. The images that are recorded in the core memory of a dead body shall make possible to have access to the connections of terrorists with the exclusion of suicide bombers.

In the movie *Minority Report* (2002) with Tom Cruise, a technology which enabled us to identify crimes through the intermediary of mediums was told. Studies on the Synthetic telepathy or telepathy casks which can read brain waves and bring out the intentions without needing the intermediary of mediums are continuing. (Kaku, 2016: 82-91) These telepathy casks were thought for the communication of soldiers between themselves and their bases. In the movie *X-Men Apocalypse* (2016) directed by Bryan Singer the audience was shown how the telepathy cask worked. In an uncertain safety environment, we can say that these telepathy casks (which can start by screening a narrow space up to the whole country) which can help detect in advance the individual terrorists named as a lone wolf and the acts of other terror groups shall take their place among the counterterrorism tools soon. All brain and mind studies, technologies produced by

these technologies shall provide great help for a safer community and from the perspective of bringing all threats to a controllable level.

Conclusion

In the world, terrorism is one of the principal safety threats for many countries. While developments in every area of the modern science provide the opportunity to the USA in the first place followed by Russia and China to renew their weapons, tools, and equipment, they use these technologies in the domain of counterterrorism. Although ensuring safety by a hundred percent is not possible with modern technology due to the likelihood that the terrorist may obtain the same technology, security cannot exist without technology

During the fight against terror, it is essential to determine the proper balance between protecting society from terrorist attacks and protecting the public's civil liberties. The most difficult part is in fact in ensuring this balance. Using civilians as human shields terrorist organizations are the cause of civilian casualties in armed fighting and try to create a public opinion against counterterrorism. In the subject of fighting against terror without suspending liberties, new technologies have become one of the major tools.

While studies in the domain of nanotechnology and neuroscience provide countries with the opportunity to improve their defense, they also provide new strategies in following preventive policies. The studies mentioned in the article concerning both technologies as works that may be useful in the fight against terrorism shall be perhaps replaced with more creative and superior technologies two years later for being outdated technologies. The primary purpose is to overpower terrorist organizations from all the perspectives and stop terrorism from being an utilizable strategy. These technologies shall continue to be in our service for sustaining a safe community at all times and all places.

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