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Application of Forensic Psychological Techniques in Military Intelligence and Support Operations

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ABSTRACT

Forensic Psychological Techniques is an integral part of any security system as it involves interaction with the actual brain behind the incidents or planning of antisocial acts. Forensic psychological techniques such as polygraph, BEOS, narco-analysis has been playing significant role in the investigation of criminal cases. However, the application of these techniques is not limited to criminal cases or civil cases. These techniques can also be used in military investigation. The forensic psychological techniques of polygraph, BEOS and narco-analysis with its theoretical background and processes are explored.

Keywords: Forensic Psychological Techniques; Polygraph; BEOS; Narcoanalysis

1. INTRODUCTION

Military personnel face significant challenges in the routine course of their work. By virtue of frequent service in a combat zone in today's conflict, work hours are long, and the need for vigilance and self-protection is high[1]. One of the biggest challenges faced by the military personnel is how to extract information through interrogation techniques after having caught an enemy within boundaries. Getting confession along with secret information is a very difficult task and so the sophisticated interviewing techniques of forensic interrogation that employ subtle psychological manipulation and observation of body language to bring out the truth can be used. More so, in light of irregular warfare, forensic enabled intelligence and biometric based identity intelligence are not a distant reality. Military intelligence and support operations are bound to encompass tasks related to the identification of terrorists, cyber criminals, bombers, hijackers, spies' etc. for which robust technology is needed both at psychological as well as physical level. Certain forensic techniques can be instrumental in fulfilling the objectives of Military Intelligence and support operations related to criminal or terrorist investigation. Forensic Psychology is a unique field as it is the only field of Forensic Sciences that deals directly with live human beings. In Indian forensic sciences laboratories, forensic psychology is mainly restricted to the use of psychological techniques for detecting deception. Polygraph test was introduced in India in the year 1970 for the detection of deception. Although initial emphasis was more on polygraph but with advances in technology, alternate truth finding paradigms became possible. Brain electrical oscillations signature (BEOS) profiling was introduced which is a technique of measuring remembrance of autobiographic memory of events, when verbal statements in sequence cue the remembrance of the associated memory, without needing any response from the suspect tested. Narco-analysis also became a forensic method in India, though it is invasive and hence, need support of appropriate medical consultants during investigation.

Focuses on the forensic psychological techniques that may be suitably applied for defense purposes in the interest of national security.

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2. FORENSIC PSYCHOLOGY

Since the dawn of the civilisation, human beings have sought out different ways of distinguishing truth from lies or deception in those individuals suspected of having committed wrong acts. Deception is generally explained within the forensic frame of reference as intentional effort by an individual to suppress facts known to him. The facts are information experientially acquired through participation in an activity or conceptually acquired through other means of communication. Suppression of facts often requires substitution with false information in the forensic frame of reference. Deception is one of the negative responses that man uses in the face of threat of certain kind. However, deception may be expressed at various levels. At the primary level, it is essentially a verbal statement containing denial of awareness of the truth. At a second level, deception may be expressed as a pretension of lack of knowledge of the truth. At a tertiary level, the individual distorts the truth in such a manner, that he finds justification for the acts committed by him. Thus, what is important from a forensic point of view is the intentional deception or lie. A lie is said when the individual

who states it knows that the denial, commitment, or the answer does not confirm to the reality. The lie is expressed as it helps one to save his self-esteem or avoid punishment. The lie helps to conceal the truth, and thereby helps to escape punishment, if one is detected and established to have committed the act. The fear or punishment and loss of self-esteem serve as the motivation for concealment of the truth. There is therefore, a clear and specific motivation for changing or distorting the truth. Though various techniques were used for detection of deception, they were quite primitive without any scientific basis and would certainly violate human rights. However, these techniques were based on the assumption that some form of physiological reactions occurred within a person when the person became deceptive, and physiological reaction would accompany deception. Certain recognisable external symptoms were considered indicative of absence of honesty and deception. This in fact gave way to the birth of various techniques for detection of deception. Polygraph recording of autonomic nervous system measures became a standardised procedure for detection of deception. On the other hand, Brain Electrical Oscillations Signature (BEOS) profiling looks for pattern of changes in the Electroencephalogram (EEG) of subject indicating remembrance of an experience or autobiographical episode triggered by auditory probes presented to the person. In Narco-analysis, the person is injected sodium pentothal to produce a state of trance (altered state of consciousness) and the suspect is interviewed on the various aspects of the crime and his role in it.

2.1 Polygraph

Polygraph is an instrument, which measures different physiological responses simultaneously as a person is questioned. The theory is that when a person lies, the lying causes certain amount of stress that produces changes in the autonomic nervous system responses. Different sensors for recording these responses, such as blood pressure, heart rate, breathing pattern (Pneumograph), galvanic skin resistance, etc. are attached to the body to measure the physiological reactions. The set of questions are administered to the client, who has to respond to these questions as 'Yes' or 'No'. Deception or lying produces characteristic changes in the physiological responses, which are quantified and interpreted as containing deception while answering the questions. The polygraph based lie detection techniques uses the autonomic effects as the marker of deception.

2.1.1 Theoretical Basis of Polygraph Examination

It was always assumed that Polygraph works on the principle of guilty mind. An individual may be feeling guilty or nervous of the act he has performed and that person's consciously held feelings produces a defense reaction in the form of physiological changes in various bodily parameters such as blood pressure, pulse rate and galvanic skin resistance. It is globally accepted that the polygraph works on the physiological changes created in a person due to emotional disturbances, which may occur due to fear of being caught than the guilt of having committed an offense[2]. Need to conceal arises because of awareness and anticipation of consequences of the action committed. The consequence of identification of the person who committed crime is the social rejection of the person, loss of self-esteem, and the punishment meted out by the authority. As it is known, a person can be held responsible for crime in the presence of adequate evidence, even the respective individual does not confess to the crime. If consequence is not expected, the individual who has committed the crime does not care to conceal the responsibility. When the perpetrator believes that he has succeeded in concealing or destroying the evidence that could be brought out in open, the perpetrator may not exhibit any discomfort about the crime committed by him. The aim of polygraph examination is to detect that the person is lying by examining the physiological responses, while the subject is questioned in a controlled manner. However, it is wrong to consider that there is a direct relationship between lying or concealing and physiological responses. The relationship between the two set of variables is through the brain, which interprets the questions and decides to respond to them. The conflict that arises in the selection of responses to the question interrupts normal physiological responses. The effects of the conflict is seen at the central level, as revealed by various functional neuro-imaging studies, and at the autonomic level as changes in the vital physiological functions. The relationship between autonomic functioning and the central mechanisms of experience of conflict has been well established.

2.1.2 Procedure of Polygraph Examination

The entire testing procedure of Polygraph comprises

A. Pretest Interview

The pretest interview of the subject to be submitted for testing is an extremely important step in polygraph examination for deception detection. During this interview, the examiner has opportunity to establish rapport with the subject as well as to hear straight from him, his version of the things that happened, as well as the pre-crime events and situation, in the manner, the subject wants to disclose. The examiner can also engage the subject in non-interrogatory interview and help him bridge the gap that may exist across events.

B. Polygraph Examination

The polygraph examination takes place during this phase. Once the examination is underway, the examiner will administer a minimum number of three separate tests each lasting approximately 5 min - and a maximum number of six tests - wherein the examinee's physiological data will be continuously recorded in the polygraph memory and displayed in its graphical charts. The tests consists of presenting set of questions one after the other and recording the questions and the answers by the subject. The questions are formulated and reviewed during the pretest phase. The examinee will have a two-minute relaxation period between each test. Upon completion of the in-test phase, the examiner will analyse, interpret and evaluate the examinee's physiological data collected during the polygraph examination.

C. Post Test Interview

Post Test Interview is also an important step in the polygraph examination. During the post test interview, feedback

is taken from the subject as to what were his feelings during the Polygraph Examination. Various questioning methods are used for polygraph examination, some of which are as follows.

a. Control Question Technique

The control question technique is the most commonly used technique in India. Two types of questions that are important to the determination of deception are control and relevant questions. The purpose of control questions is not to detect lies about the past of the individual, for enquiring into the criminal inclinations of a subject, or to make one disclose embarrassing aspects of one's habits. They are to be used merely to pose such questions, which can produce discomfort and anxiety in the subject, so that the response pattern can be used as a baseline. They are used only to compare the physiological responses of the relevant questions to the baseline which has been taken from the control questions. The control question technique is applied either through probable lie test or directed lie test depending on individual subject.

b. Guilty Knowledge Test

Guilt knowledge test also known as concealed information test is one of the most used questioning technique globally. The guilty knowledge test (GKT) was developed by Lykken[3]. Essence of the test is to ask a question with multiple answers of which one is relevant to the crime and the others have neutral value. An innocent suspect will find all the answers of neutral value as of the same relevance to the crime, whereas one connected to the crime will find a special significance to one of the answers[4], which he or she alone knows to be significant. If the subject's physiological response to the relevant answer is significantly greater than that for the other neutral ones, the subject is inferred to be connected with the crime investigated.

c. Peak of Tension

This test is close to the guilty knowledge test as the questions can be asked with probable alternative answers. Each alternative is expected to cause greater tension than the previous, as it takes the subject closer to the true answer. For example a question such as: How much money did you remove from the bank? (i) Rs. 30,000, (ii) Rs. 70,000, (iii) Rs. 1,00,000, (iv) Rs. 5,00,000. The tension and the response increases as the alternatives become closer to the actual amount removed from the bank, if the suspect is the perpetrator. Tension peaks, when the right alternative is presented.

A critical part of polygraph examination is the analysis and interpretation of the physiological data recorded on the polygraph charts. While scoring the charts various parameters have to be considered. Most commonly method analysis uses visual quantitative analysis, other than complete computerised analysis of the recordings. To apply the scoring rules for the particular testing technique or format, one must know the decision rules and which diagnostic features to assess within each channel.

2.2 Brain Electrical Oscillations Signature Profiling

Brain electrical oscillation signature profiling (BEOS) is a computer based technology to identify the remembrance of any activity, including criminal activity committed by a person. This technology is developed by C.R. Mukundan and is a technique for extracting a signature of remembrance from the electrical oscillations recorded from the brain of a subject, while listening to probes, which contain references to the activity[5-8]. The signature has been called the experiential knowledge (EK) of remembrance of the activity referred by the probe. The Subject is made to become aware of the experience by the probe. During recall of EK, the subject recalls the related autobiographical information. Signature is measured as frequency-time domain activity during or immediately after the presentation of the probe. The electrical oscillation pattern is evoked by remembrance of the experience reflected in the nestled probes. Several probes sequentially arranged are presented to a person for eliciting EK responses, which are present only if the probe elicits remembrance. The EKs are considered significant only when several related probes elicit EKs. Conceptual knowledge of act obtained through communications with others or from published materials does not elicit EK response. The EEG is analysed automatically by the NSS program, which produces an auto-generated and interpreted report of the results of signal analyses of each probe. The technique has been successfully used in the investigation of several criminal cases[9-12]. The normative study[13] conducted using the BEOS technique has yielded sensitivity and specificity above 90 per cent - 100 per cent range when Mean + 2/3 SD scores of the Control group are used as cut off scores for identifying the experimental group. Figure 2 portrays the electrical activation seen on BEOS Profiling during actual conduction.

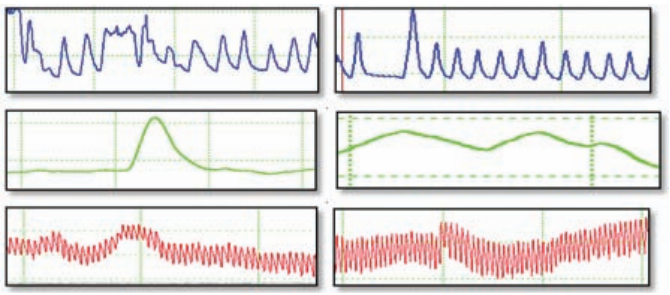

Figure 1. Graphs Depicting Various Diagnostic Features.

2.2.1 Theoretical Basis of BEOS Technology

It was Mandler[14] who first differentiated remembrance from knowing. There have been several neuro-imaging studies which differentiated the neural activation in remembrance from the activation found in knowing[15-18]. These studies revealed that remembrance is characterised by extensive activation of ventral brain, anterior cingulate cortex, orbito-frontal cortex, and medial temporal cortex, whereas knowing requires a much smaller engagement of brain resources and is seen mainly in the dorso-frontal and prefrontal cortex. Remembrance of experience is found to be automatic and mandatory in the presence of a stimulus, which can cue the remembrance[19]. The pattern of electrical oscillations seen in cued remembrance has been analysed and used to identify the presence of experiential knowledge, which is seen to be absent if the subject has mere knowledge of the same experience[20].

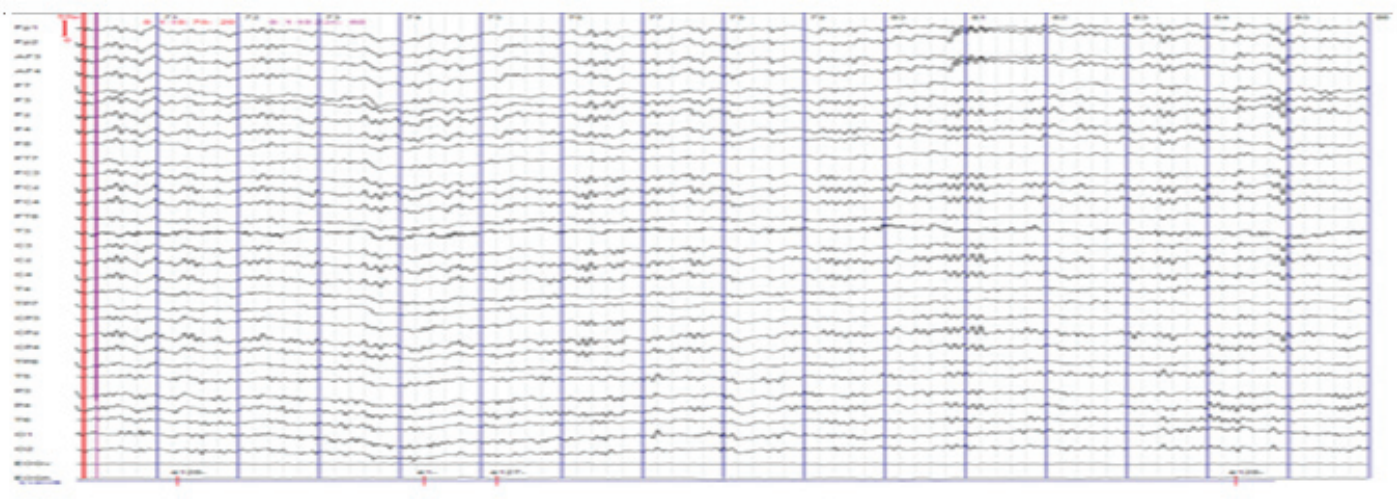

Figure 2. Graphs depicting electrical activation during BEOS profiling.

2.2.2 Testing Procedure of BEOS

The entire testing procedure of BEOS comprises of the following steps.

a. Interview with the Investigating Officer

An interview with the Investigating Officer is the most important step and the base for successful BEOS Profiling. Entire case details have to be taken from the Investigating officer that will help recreate the crime scene as well as involvement of the individuals to be tested in different aspects (crime related activities) like prior, during, and after the crime were committed. Along with the information available, all the relevant documents such as FIR, Panchanama, Crime scene photograph, Post mortem report are studied for the formulation of probes and scenarios.

b. Interviewing the Subject

In the next phase, the individual to be tested is interviewed in detail. The interview must probe details of early education, family details, occupational details, and important events in life, which may not have any relevance to the crime, and then the crime related details. The individual is also enquired of his version about his involvement in the crime, if any, and is assured that his version will also be tested. The individual is told about the aim of the test, and that he is expected to recall the probes heard after the testing is over and that he must write down the probes during the recall session.

c. Probes and Scenarios Creation

A probe is a short verbal statement presented in auditory mode. These probes are arranged scenario wise and each scenario consists of a specific event that was believed to have taken place. They are sequentially arranged (as formulated by the IO and the examiner) to produce a mental picture of the components of an action carried out by the subject. They need not be syntactically complete sentence. Several probes presented one after the other may provide a semantically comprehensive reference to the different components of a crime scene. Role of the probe is to trigger remembrance, if the related autobiographic memory is present. The subject is also shown the entire list of probes for reading, before testing and encouraged to discuss any related issue. There should not be any concealed information about which the probe may refer without the prior knowledge of the subject and probes must be worded without causing any trauma or novelty or surprise effect in the subject. The 4 groups of probes used are as follows.

i. Neutral Probes

They are completely irrelevant to the case. These probes do not reflect any personally significant information and they are expected to produce only semantic activation.

ii. Control Probes

They are based on the subject's personal life of which information is given by the subject, which the Investigating Officer does not object to as incorrect.

iii. Target A Probes

Investigating Officer's version or formulations/ hypotheses- The probes in these target scenarios are based on the information given by the IO. The IO may have different formulations about the occurrence of an activity and probes referring to these different hypotheses are separately grouped and presented.

iv. Target B Probes

Subject's version- The probes in this target scenarios are based on the subject's version of his involvement or alternate activity that he claims to have carried out at the time of occurrence of the crime.

d. Pre-test Interview

Pretest interview of the suspect is of paramount importance. Subject must be informed about the various actions that he is suspected to have carried out and that the probes will refer to all those activities. No information presented in the probe is withheld from the subject. The suspect or the accused could be convincingly told that the test could elicit supportive findings for his version also which can be used to exonerate him. This helps the examiner to play an impartial role in the BEOS testing.

e. Actual Conduction

Before the conduction of the test, informed consent is taken in writing from the subject and he is read out the probes in the sequential form. He is then provided with all the instructions. Subject is taken to the recording room and asked to sit on a chair. An electrode cap is attached to his skull and he/she is informed that he has to listen to the probes attentively. EEG recording is then taken and afterwards he is expected to recall the probes heard earlier.

f. Post-test

Post test interview is also an important step in the BEOS profiling as it was in polygraph examination. During the Post test Interview, a feedback is taken from the subject as to what were his feelings or experiences when he underwent the testing. He is also asked to recall the probes.

BEOS Profiling is an effective technique and can be applied to various criminal cases for the purpose of investigation such as

- Identifying involvement of an individual in a particular case
- Identifying roles played by each person in a criminal case (in cases wherein there are more than one person involved)
- Identifying if a person is involved in one particular crime & not in another crime (in case of habitual offender)
- Proving innocence.

2.3 Narcoanalysis

History of use of drugs to alter consciousness for the purpose of 'truth elicitation' dates back to the early 20th century. The phrase 'truth serum' was also believed to have appeared in 1920's. Dr Robert House had discovered that giving the drug scopolamine to women during childbirth caused them to talk uninhibitedly about their feelings and thoughts, which led him to believe that scopolamine might help in criminal interrogations. But his effort to utilise it for larger policing purposes failed. However, Central Intelligence Agency picked up his research thirty years later and began investigations for other such compounds[21]. Nonetheless, the use of this technique in India has largely been restricted to the Forensic set-up. It was used for the first time in 1988 in a case registered under official secret act.

2.3.1 Theoretical Basis of Narco-analysis

Narco-analysis creates a state of mind in the individual by relaxing him/her and thus leading to a lowering of individual's defense mechanism. Thereafter process of free association is used for encouraging an individual to express information, thoughts. As per the neuropsychology model, with the advances in understanding the regulatory mechanisms in the brain, neuroscientists have tried explaining the various aspects of human behaviour. Frontal lobes have been identified to be the control centers for our cognitions, emotions and motor behaviour[22-24]. Neural structures are responsible for the most striking features of our brain functioning, i.e., the self-monitoring, self-generating and self-regulating abilities. Therefore, an altered state of consciousness and resultant changes in the level of awareness leads an individual to loose these inhibitory capacities. A person undergoing narco-analysis displays disinhibited behaviour indicating a relative loss of inhibitory control which may possibly lead to disclosure of suppressed information.

2.3.2 Procedural Requirements

Despite severe criticisms that individuals under trance, induced by neuro-chemicals may still provide deceptive answers to questions, the Narco-analysis technique has been used in several cases with the written informed consent of the suspect in a few cases. Narco-analysis, as a forensic technique has been conducted in operation theatre in a controlled medical set-up with the facilities to monitoring vital physiological parameters. The mandatory team of experts includes a Forensic/ Clinical Psychologist or a Psychiatrist, Anesthesiologist, General Physician, Videographer, and supporting nursing staff[25]. It is necessary to check for the medical fitness of the subject and only if the subject is medically fit, he or she can be taken for the testing. The anesthesiologist administers the drugs mainly Sodium Pentothal to the subject in the presence of other competent medical professionals, in small increments till the subject exhibits symptoms such as slurred speech, motor restlessness. The drug is continuously administered in small doses to maintain a state of anesthesia. During this state, a forensic psychologist interviews the subject and tries to obtain information regarding crime.

3. CONCLUSIONS

Although the above described systems are extremely useful in interrogating and investigating criminal offences but in many countries including India there are some legal restrictions imposed on utilising these techniques. The legal system empowers people to defend themselves. No individual can be forcibly subjected to any of the techniques in question, whether in the context of investigation in criminal cases or otherwise[26]. However voluntary administration of the impugned techniques in the context of criminal justice is permitted, provided that certain safeguards are in place. Though these techniques are used mainly in criminal cases through Forensic Laboratories, its use in military interrogation can be of tremendous help. Forensic enabled intelligence shall require robust psychological techniques for providing operational support during counter terrorism, counter drug, anti-cyber theft, and counter-proliferation of weapons of mass destruction operations. Using the same shall aid and direct military operations and intelligence in achieving favorable outcomes in the interest of national security.

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In the present study, he was involved in planning, coordinating and overall coordination of the study.