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Disorders *of* Executive Functions *Civil and Criminal Law Applications*

Edited by

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wishes to portray acceleration or deceleration before offense-related violence. This would mean that the examiner would count violence the year before the instant offense, not from the time of the evaluation. Long-term periods (e.g., 3-year blocks) may be considered for more protracted periods of time, say for sentencing or programming purposes.

Prepotent basal violence is a term used for a past history of violence that is recent (within 3 months), multiple (more than one previous act of violence), and severe, the last depending on the severity value obtained from the previous presented system. The suggested typology of basal violence may be helpful in determining true basal violence for individual perpetrators. It is partially normative-based with built-in reliability and validity values for some of its dimensions (e.g., severity). It is dynamic in terms of changes in classification over time. The classification scheme does not require highly skilled training and could be used in most settings where violence is an issue. Trends in violence for individuals can be crudely estimated in the search for extraneous factors that bear upon any increase or decrease of violence. Lastly, the scheme may have relevance to treatment.

The forensic expert must consider the basal violence of the examinee to help explain the instant offense. Basal violence is compared with behavior at the time of the instant offense in the same manner evaluation findings are retrospectively linked to the alleged offense. This places the examiner in the position of utilizing both current and historical data to understand the alleged offense. Violence prediction is a mandatory part of the sanity evaluation in many jurisdictions when an exculpatory conclusion is rendered. Basal violence is the key determinant of future violence. An examination of basal violence leads directly to the following. How much of the violence in a specific case could be self-controlled, and how can this be demonstrated to the satisfaction of the criminal court?

Assessing Executive Functioning

If warranted by the aforementioned data base, the evaluator should diagnose a disorder of executive functioning for both the times of the evaluation and the instant offense. By doing this, the court and all parties concerned would know that two distinct sets of observations were taken into account and that the executive impairment did not originate or worsen after the alleged crime. Further, all existing tests of insanity require a diagnosed condition at the time of the alleged offense in order to address the relationship between the accused's mental condition and the crime.

Specific reasons for an organic mental disorder in general and a disorder of executive functions in particular can be corroborated. First, composite neuropsychological test battery data associated with various characteristics of brain damage can be provided. Second, anterior dysfunctions can be elaborated. For example, involvement of the mesial aspect of the frontal lobe is associated with changes in sphincter control (bowel and bladder), as well as with blunt affect. Partial complex seizures, as well as *déjà vu* and *jamais vu* experiences can originate in the anterior temporal lobe. Impairment of the sexual libido sometimes stems from bilateral or right frontal damage. Disinhibition of sexual impulses can implicate baso-orbital lesions. Impaired olfactory discrimination can stem from tumors in the orbital region where Cranial Nerve I originates. Impaired orienting responses can involve the dorsolateral area of the frontal lobe, in addition to cingulate gyrus damage. Mutism or paucity of speech with no maintenance of speech flow is seen with berry aneurysms of the anterior cerebral artery territories. Frontal seizures may create eye/head turning in the direction away from the seizure site. Other violence-related behaviors associated with anterior impairments have been mentioned. They include the baso-orbital and posterior medial regions, with their rich and intimate connections to the limbic system.

Lezak (1983) has indicated that the five most common behavioral symptoms of frontal lobe dysfunction are: (1) problems starting tasks, characterized by diminished spontaneity and initiative, reduced productivity, and diminished verbal output (generally associated with damage in the medial frontal areas); (2) problems in making behavioral/cognitive shifts, characterized by perseveration, mental rigidity, and stereotyped behaviors, all of which are supramodal in nature (generally associated in damage to the dorsolateral convexities); (3) problems stopping ongoing tasks, characterized by impulsivity and over-reactivity (generally associated with the baso-orbital area); (4) deficits in self-awareness, characterized by inability to see one's mistakes and their impact on others, and to properly evaluate social situations. Defective self-criticism and unconcern about social conventions are associated problems; and (5) a concrete attitude, where events are taken for their face value with an inability to separate one's self from one's surroundings. The abstract ability may or may not be intact, although this ability is likely to be impaired if the patient has damage in the dorsolateral frontal lobes.

Lezak (1983) also suggests that the florid, spontaneous confabulation occasionally seen in frontal lobe disorders is frequently associated with subcortical lesions in the medial basal white matter. Motor skill deficits are frequently attributed to lesions in the premotor association areas. An impaired sense of time is associated with bilateral frontal lesions. Cognitive integration deficits are more associated with damage to the dorsolateral convexities, whereas emotional control deficits are apt to reflect subcortical lesions or damage to the pathways from the neo-cortex to the diencephalon.

The value of such specificity is that it allows for other investigators from allied health disciplines to focus on expected behavioral deficits and anomalies. A positive computer tomography (CT) scan showing frontal lobe lesions or atrophy, combined with neuropsychological test findings suggesting the same results, may help in convincing the court that the accused was volitionally impaired. (Hit rates of medical tests for brain damage and laterality are generally inferior to neuropsychological testing results, see Boll, 1985.)

A second value of specificity concerns the notion of delay in impulse control and need gratification. For example, prosecuting attorneys make an issue of time delays between initial observation of the victim by the accused and subsequent criminal violence, as if the victim sighting—time delay—violent behavior sequence represents a unitary behavioral phenomenon (and therefore greater defendant culpability). Lezak's (1983) observations would suggest that such time delays would reflect slower initial goal formulation, slower shifting to an action plan, and slower stopping of the criminal behavior once it is initiated. Whether goal formulation and action planning occurred immediately after the victim was sighted or just prior to an assault certainly would suggest a new interpretation of any revealed time delay, at least for individuals with a disorder of executive functions.

The evaluator should look for behaviors associated with frontal lobe damage, in addition to anomalies from other sites and systems. The list of symptoms associated with frontal lobe dysfunction (Table 3) has been obtained from a wide variety of sources. The reader should be aware that the overlapping symptoms may reflect damage to other areas of the brain, or even functional impairments and that frontal lobe damage varies in symptomatology, depending on the site, severity, and recency of damage, and the intertwining of neuropathologic processes.

Self-Regulation and Self-Control

For criminal cases, the evaluator examines the alleged offenses according to the account presented by the accused versus that presented by the victim and other cross-validating sources.

The perpetrator should present a full crime account unless he or she was amnesic for some or all of the crime, or if malingering is an issue. If amnesia did occur, the evaluator should specify a condition that would account for that lack of information encoding or recall. Possible explanations include the following, either alone or operating in combination with one another: (1) extreme emotional states and stress characterized by pain, anger, fear, or loss; (2) dissociative states; (3) florid psychosis that may also create a psychotic recall; (4) epilepsy; (5) gross substance intoxication and blackouts; (6) poor comprehension; (7) aphasic difficulties; and (8) specific brain syndromes (e.g., an acute confusional state). The possibility of malingering should also be evaluated according to the previously suggested methods. Clinically, the "feeling of knowing" (e.g., when true amnesics state that they could recall if cued properly; malingerers state that their recall would not improve) has been isolated as being helpful in differentiating true amnesia from that that is being faked.

The evaluator should be on the alert for defendants with genuine amnesia-producing conditions, who, nevertheless, deceptively exaggerate the length of the amnesic episode or critical events of the instant offense. In such cases, the same procedures as previously suggested should be followed—the evaluator should first obtain a basal level of responding from data base measures, then test for deliberate distortion. When giving parallel IQ tests, (e.g., double administration of the Slosson Intelligence Test or Peabody Picture Vocabulary Test) or redundant testing (e.g., digit span tests on the Wechsler Scales or Wechsler Memory Scale) the evaluator should use the higher score to elicit the optimal level of neuropsychological performance on tests. The higher score implies the capability to perform at that level on the employed measure. Such a method may be used, for example, when "faking bad" is suggested. It is important to recognize that some serious attention deficits can produce inconsistent performances on some tasks in which attention is necessary (i.e., digit span, Wisconsin Card Sorting Test).

The evaluator should analyze the instant offense for the defendant's abilities and deficits in areas relevant to behavioral self-regulation. Parameters to be considered during the commission of the crime include: (1) coherence and other characteristics of speech suggesting intact verbal expressions; (2) intensity and appropriateness of affect (e.g., especially during portions of the crime sequence that would normally produce strong emotion); (3) the focus of the crime, ranging from nebulous to markedly specific; (4) substance intoxication; (5) current, long-range mental conditions such as retardation or focal brain damage; (6) behaviors requiring immediate, short-term, and historical memory skills of discrete sensory modalities or a combination of modalities; (7) gross-motor, fine-motor, perceptual-motor, and motor-sequencing skills; (8) level of substance intoxication (in most jurisdictions, all but pathologic intoxication is considered inculpatory); (9) presence of bizarre behavior; (10) level of anxiety; (11) presence of delusions and/or hallucinations; (12) presence of depressed or expansive mood; (13) planning and preparation; (14) awareness of criminality; (15) level of activity; and (16) self-reported control.

The defendant's activities during the week before the instant offense (see Rogers Criminal Responsibility Assessment Scales—R-CRAS below) should be checked for behavioral deterioration, especially in self-care, work productivity, and in the central love relationship. The evaluator must also consider whether or not the alleged crime represented the accused's first significant act of violence. For many of these parameters, quantitative measures on an empirically validated, likert-scale format can be obtained from the R-CRAS (Rogers, 1984) and the Schedule of Affective Disorders and Schizophrenia (Spitzer & Endicott, 1978).

Other considerations include the use of a weapon designed for attack (gun, knife, numchuka), which would indicate a chain of responses more subject to control (i.e., selecting, obtaining,

concealing, carrying, reaching for, and attacking with the weapon). Chains of responses usually call for shifts in behavior programs and lessen the likelihood of impulsivity. The next level of complexity involves use of a weapon designed for attack that the perpetrator found at the scene of the crime. A defendant's use of his or her body to club, strangle, or kick a victim suggests a primitive response. An attack with certain parts of the body (e.g., biting, banging one's head against the victim) suggests an even more primitive level of aggression. Continuing to attack nonvictim entities suggests further loss of behavioral self-control.

The accused's flexibility of response and method of attack should also be considered. The use of multiple weapons or shifting back and forth from one method of attack to another suggests that different executive functions were utilized. This suggests the presence of self-control, even in frontal lobe-impaired persons.

Linkage of Deficits and Crime Behavior

The evaluator must now compare crime-specific behaviors reflecting a disorder of executive functions with those elicited during the neuropsychological assessment. This statement is based on two assumptions. The first is that the defendant's behaviors at the times of the evaluation and of the crime represent task responses, even if the production may be viewed as maladaptive.

The second assumption is that, given a valid and comprehensive data base, task behaviors shown by the defendant during the neuropsychological evaluation (with the built-in structure and encouragement for best performance) are the optimal responses that the defendant can produce. The defendant's behaviors exhibited during the instant offense should not exceed the evaluation performance. Instant offense behavior should be more maladaptive, considering the stress and contextual features of most violent crimes. For example, perseveration shown on motor-sequencing tasks should also be present in some form during the crime if the opportunity existed. The key here is to look for evaluation and crime behaviors that are functionally similar. The behavioral sequence involved in intercepting a victim, for example, should contain the same or a greater degree of behavioral disorganization as in tasks administered during the evaluation to tap this skill. If behaviors shown during the crime appear to be the functional equivalent of the type as well as the level of evaluation performance, this is an indication that stress or other events that act to disrupt the execution process were not operating. This suggests a higher level of self-control and means that, during the crime, the accused was acting at a near optimum level. The evaluator must also specify crime-specific factors that operate to disinhibit the accused or to deteriorate his or her coping abilities. Otherwise, one is left in the position of explaining why the defendant does not aggress continually, despite the presence of a presumably chronic organic condition.

If impairment of self-regulatory behaviors is elicited during the assessment, this information cannot be used in a forensic context to support loss of self-control unless the hypothesized frontal lobe dysfunction or other proffered mental condition caused those responses. This is because in all jurisdictions, impairments must always be the result of the accused's diagnosed condition. Further, the cause must be direct, and not secondary. Incapacitating, self-induced alcohol intoxication at the time of the crime that may have contributed to or was triggered by frontal lobe-related behavioral impulsiveness is considered an invalid argument for escaping criminal responsibility. This further decreases the range of behaviors that can be used as the basis for exculpation. The symptom pool is restricted even more by the exclusion of all disorders of

executive functions that were operating at the time of the crime but had little to do with mental capacity interference (e.g., mild motor deficits in a "successful" assault).

Illustrations of possible instant offense-evaluation links are presented in the following section. These are presented only as hypotheses to consider and not as proofs of their existence. The evaluator may note their possible operation during the instant offense in order to select neuropsychological tests to assess those functions and deficits.

ATTENTION AND ALERTNESS

In analyzing violent-related responses, the evaluator may consider the degree to which the defendant attended to the victim and contextual stimuli. Proper attention and alertness are considered necessary to effectively plan, select, shift, and monitor task-oriented responses. Key issues in this regard include the following.

Look for confusion. Frontal inattention, sometimes involving conjugate deviation of the eyes and forced circling (toward the side of the lesion) should be ruled out. Insensitivity to other sources of stimuli should be analyzed (e.g., noise, lights, presence of bystanders). Did the accused miss important details, such as whether the victim was carrying a weapon? The normal response is a "weapon focus" in attending to others who use, threaten with, or otherwise handle potentially lethal weapons, particularly guns and knives.

Given adequate attention, orientation to time, place, person, and circumstances should not be impaired. The "wrong" victim, due to misidentification, is occasionally chosen in what appears to be random stranger violence. On occasion, the "wrong" person may be aggressed upon because of the defendant's distractibility and difficulty in focusing towards the intended victim.

The evaluator should be on the alert for attention and alertness deficits in verbal interaction between the perpetrator and the victim. In almost all cases, physical aggression is preceded by verbiage from and/or to the victim or others. Is the perpetrator speechless, akinetically mute, or is there normal quantitative output and articulation? Does the victim have to repeat questions? If so, the implications are twofold: First, the perpetrator may not be attending properly to verbal stimuli; second, the victim's frustration may have increased, thus creating a synergistic phenomenon in regards to the initiation of violence. Look for dissociation between the perpetrator's words and actions (e.g., expressing willingness to discuss a problem while preparing to attack the victim).

The presence of substance intoxication may interact with frontal lobe deficits to create violence. Although some experts view intoxication due to substances as a disorder of executive function that is associated with disinhibition of aggressive impulses from the limbic system, the law sees voluntary substance ingestion as inculpatory. In a lesser sense, the voluntary cessation of stabilizing medication may be seen by the law as a sign of culpability.

Substance intoxication, superimposed on supposed frontal lobe deficits that culminate in violence, may make it impossible to isolate specific executive function deficits that created an alleged mental incapacity. When substance intoxication is involved, "all bets are off" in terms of accurate forensic description and isolation of neuropathologic processes. In such cases, the evaluator must rely on identification of crime behavior that is congruent with the loss of presence of self-control, irrespective of possible brain damage.

Did the accused confabulate due to inattention? Often, confabulation represents an attempt to fill in the gaps due to inattention or to frontal lobe recall deficits (see the following section). The impact of confabulation on the victim prior to the instant violence should be considered.

MOTOR

Frontal lobe motor deficits are typically characterized by slowed initiation, excessive responses (i.e., perseveration), motor impersistence once started, and difficulty in changing one's own behavior. Motor impairments are often accompanied by emotional excess (seen as disinhibition) or a lack of emotion, as when perpetrators commit acts of violence with no apparent emotional reaction. The law appears to equate motor execution with "volition" and intent or anticipation with "cognition." The volitional arm of the federal tests of insanity under the American Law Institute (ALI) has been recently dropped in an increasing effort to delimit the mental incapacity concept. The net effect is that motor behaviors are viewed as secondary to intent.

Motor deficits are now seen legally as that which is relevant to the *actus reus* (deed of crime) rather than *mens rea* (evil intent). *Mens rea* is seen as a cognitive capacity and is the standard by which mental capacity is judged. The law seems to say, "The significance of motor deficits beyond describing the guilty act is minimal, since (evil) thoughts are behind all serious illegal violent acts." A connection between evil intent and an unlawful behavior is seen as necessary in order to demonstrate the occurrence of a crime. Such a view ignores the motivational components of motor behaviors.

Motor impairments do have relevance to *mens rea*. The grasp reflex, for example, which is a frontal release sign whereby objects or people may be grabbed and held for a few moments, may easily be interpreted as a threat involving physical contact. Frontal signs may be absent except for a lack of drive. Therefore, the victim and onlookers may not suspect brain damage, especially since the grasp reflex is known to be set off by stress and depression. In magnetic apraxia, the accused may spontaneously explore the environment in pursuit of a stimulus to grasp (utilization behavior). This is hardly the picture of an individual who is out of control, especially since successful utilization behavior requires some skill integration. Yet, utilization behavior is rarely, if ever, seen without frontal lobe dysfunction. If some frontal lobe-impaired persons are touched by an object, there may be active pursuit, with headturning. A "gluing" effect (e.g., of a frontal lobe-impaired person to a victim) occurs if the perpetrator tries to move, with leg stiffening and Kleist's *gegenhalten* (counterpull). The degree to which these behaviors occurred in criminal contexts should be explored fully.

Motor perseveration occurs in many crimes. With some frontally impaired persons, the initiation of the violence may have been well-planned or impulsive, but in either case, it quickly shifts to disorganized behavior. Continuing to strike someone past the point of resistance is an example. Other normal inhibitors fall off. Injury to the victim, blood and gore, urgings to stop, threats to his own safety if he continues, may all have little or no impact.

MEMORY

Loss of short-term recall for what one was supposed to remember differentiates frontal lobe memory from more posterior recall deficits, although classic amnesia signs in individuals with frontal lobe damage are usually absent. "Frontal amnesia" or provisional memory deficits may be due to difficulty in switching from one memory trace to another, especially when interference factors are present. The frontal "memory" system has intimate connections with the limbic-diencephalic system. Therefore, motivational and emotional problems may also be present. The dissociation between verbalized intentions (or agreement) and actions can often be observed,

even with adequate attention and mental alertness, and is often seen as a blatant disregard of instructions or commitments. In sexual assault cases, anything short of a clear "no" before the aggression often results in persistent sexually aggressive behaviors. This is very different from nonorganic sadistic rapists (as in serial rape murderers) who may thrive on the pain cues of the victim.

After arrest, Miranda warnings regarding the rights against self-incrimination may be violated if frontal lobe recall problems are not taken into consideration. In forensic settings, individuals with frontal lobe damage may understand that they are "frying" themselves, but nevertheless persist in offering confessions. Even worse, they may not recall what they have previously confessed to, and often contradict themselves.

COGNITION

Overall intelligence may not be affected in individuals with frontal lobe pathology. For the accused, a social situation involving violence may represent a novel event. Simultaneous stimulation from a variety of context sources may cause the accused to show disorganization in convergence and integration abilities. Simultaneous sources of material may confuse perpetrators beyond their abilities to deal with them. Thus, they may respond to a fragment of the situation. For example, a victim's manner of dress may represent seductiveness or an invitation to engage in a sexual act. The perpetrator may see a person carrying a weapon as having an intent to harm, despite an actual intention to protect if other victim characteristics were taken into consideration.

Abstraction abilities may be impaired in violent defendants. An inability to conceptually remove themselves from their surroundings certainly adds to the potential of violence. However, a switch in principle ("change of action") may not have occurred until that time (e.g., from emotional venting to assault). The switch may require an extraneous stimulation (e.g., a loud noise, sudden movement by the victim). Potential victims may want to wait until the accused shows tiredness, when they can physically leave the scene of the possible assault. The chances of such aggression reoccurring increase if the victim insists on remaining at the scene.

LANGUAGE

Virtually all significant crimes of violence involve some prior verbal statements, even if only brief, by the perpetrator or victim, or both. Characteristics of the perpetrator's language that may create emotional responses from the victim include (1) flaccid paretic dysarthria (hypernasality, breathy phonation, stridor); (2) explosive speech (e.g., due to cerebellar atrophy); (3) flat tonal quality, combined with an apathy often seen in left frontal lobe damage. This last trait may then lead witnesses to conclude falsely that they should increase their efforts to properly communicate with the perpetrator. Hyperphonia may result in the victim missing the perpetrator's words or asking that the words be repeated or spoken louder (these requests are likely to be ignored or perceived negatively by the perpetrator); and (4) pressured speech. Pressured speech, noted in posterior aphasics, may represent a release of frontal speech control mechanisms.

Almost all speech problems secondary to frontal lobe damage are characterized by white matter and subcortical involvement. Therefore, motor and emotional overtones to speech deficits can be expected.

Aphemia is a good indication of frontal lobe pathology. Acute mutism or poor articulation may occur and worsens when the perpetrator is under stress. The occasional tendency of aphasics to speak with an apparent foreign accent may result in strangers believing that the perpetrator was a foreigner or had attempted to disguise his or her voice. Aphemia is usually associated with Broca's area lesions or a subcortical undercutting of Brodmann's area 44.

Impaired supplementary motor area (SMA) functions may cause involuntary motor activities of the perpetrator's dominant arm during the alleged offense. These actions may be seen as threatening to witnesses, especially since they are usually accompanied by a reduced verbal output. Yet, the perpetrator's expressed sentences may still be grammatically correct.

Consider Broca's aphasics who may exhibit frontal alexia in relationship to postarrest behavior. They may read the title correctly, but may not understand the details on the actual constitutional rights form. In terms of forensic treatment, offenders may state a desire to return to work, but fail to mobilize the resources to do so. The perpetrator may be seen as lying in order to obtain a reduced sentence.

In sum, language deficits may affect victim behaviors, contexts involving confession, and rehabilitation. Further, if the regulatory powers of speech are lost, inner speech becomes impaired, along with the ability to properly implement or monitor one's verbal and motor behavior during interactional behavior.

Circumscribed Conclusions

It is important that the evaluator offers only the conclusions that are relevant to the forensic referral question. The conclusions should be presented in a sequential fashion and in a language comprehensible to those outside the neuropsychological field.

Sample conclusions for a hypothetical examinee assessed for mental capacity are offered as follows:

1. The forensic data base was sufficient to draw some relevant conclusions beyond a reasonable degree of psychological probability. All conclusions were rendered independently of other forensic examiners in this case.
2. An analysis of possible distortion of data base material suggests that the evaluation is an accurate representation of the accused at the time of the evaluation and the alleged crime.
3. The mental condition of the accused for the time of the evaluation was *Organic Mood Disorder* (DSM III-R Code 293.83). This is consistent with a frontal lobe dysfunction and is represented by a discrete set of neuropsychological deficits and behaviors, including disturbance in mood (i.e., flattened/blunted affect) and marked behavioral perseveration. A *Specific Developmental Disorder NOS* (Code 315.90) is suggested as a DSM-III-R Axis II disorder. Other relevant physical problems for the time of the evaluation include polyuria and polydipsia as DSM III-R Axis III conditions.
4. The mental condition of the accused for the time of the alleged offenses includes *Organic Mood Disorder* and *Adjustment Reaction with Mixed Disturbance of Emotion and Conduct* (Code 309.40) in addition to the *Specific Developmental Disorder* and above-noted Axis III physical problems. Severity of psychosocial stressors (Axis IV) for the year before the instant offenses is seen as being between "severe" and "extreme" using DSM III-R criteria and as exceeding the 90th percentile of cumulative stress as measured by several standardized stress scales. The highest level of adaptive functioning (Axis V) is "poor" for the six months prior to the instant offenses.

using DSM III-R criteria and was reflected by a marked deterioration in self-care, work functions, and/or marital/sexual relationship.

5. The accused is competent to proceed legally. He or she has a basic understanding of the nature and quality of the legal proceedings, of some but not all of the possible consequences to himself or herself, and can cooperate with his or her attorney in his or her own defense within his or her capabilities and limitations. Competency to proceed is not likely to improve substantially, given the expected chronicity of his or her organic brain condition. On two standardized measures of legal competency, he or she scored as fit to proceed, with previously noted deficiencies.
6. In the examiner's opinion, the extent to which the above-diagnosed mental conditions impaired the defendant's cognitive ability to appreciate the wrongfulness of his or her acts was mild to moderate on a scale of negligible, minimal, mild, moderate, considerable, and substantial. The defendant stated at the time of the alleged crime that he or she knew he or she was doing wrong and had full recall for instant offense events.
7. In the examiner's opinion, the extent to which the above-diagnosed conditions impaired the defendant's volitional capacity to conform his or her conduct to the requirements of the law was substantial. This is based upon the interactive effects of (1) impaired self-control and other executive-related deficits resulting from the suggested mental disorder, (2) substantial and cumulative psychosocial stress, (3) significant behavioral deterioration both for several months and just prior to the instant offenses, and (4) [specify other factors].
8. An assessment of the defendant's risk of danger and proposed intervention are required in this jurisdiction if a potentially exculpatory mental condition is proffered as in the present case. Violence potential for this individual is seen as substantial due to predisposing variables such as his or her mental condition, present triggering stimuli, opportunity factors, and recent and severe violence. Forensic hospitalization is recommended.

SUMMARY

The foregoing discussion must, by necessity, rest upon the limited assumptions and state-of-the-art neurodiagnostic technology in the area of brain-behavior relationships in general and a disorder of executive functions secondary to frontal lobe damage in particular. Nevertheless, it may have applicability to the analysis of crime-specific behavior. The focus of this chapter is on ways for the forensic evaluator to demonstrate the crucial link between the neuropsychological evaluation and alleged offense behaviors. Failing to do this is often the bane of defense strategies where, in fact, brain damage may have been established.

A decision path is recommended for criminal cases using the following process and content factors:

1. *Obtaining a multisourced and interdisciplinary forensic data base.* This data base targets in on known correlates to disorders of executive functions, utilizing a wide range of neuropsychological tests and measures, all within a composite battery that yields information on other impaired brain functions, lateralization, progression, etiologic and prognostic factors, and potential intervention.
2. *Accounting for retrospective and current distortion,* particularly malingering, in order to obtain a deliberately poor performance.
3. *Examining basal violence* in terms of relevant parameters in order to determine the degree to

which past dangerousness was proactive and voluntary versus reactive due to stress or factors interacting with the disorders of executive functions.

4. *Diagnosing a disorder of executive functions*, if warranted, for both the time of the evaluation and for the alleged offense.
5. *Analyzing self-regulation and self-control during the instant offense* for factors that ordinarily rule out mental capacity (e.g., complex partial seizures, gross perseveration, psychotic symptoms) and for factors that suggest ruling in mental capacity (e.g., crime rehearsal and preparation, acts resulting in financial or other gain, use of weapons).
6. *Linking a disorder of executive functions with instant offense behavior*. This linking occurs by searching for symptoms that are functionally similar to neuropsychological evaluation behavior, and that represent a deterioration from baseline evaluation performance and hence point to other operative factors that explain the alleged crime behavior. The other factors may be mental conditions or events in addition to brain damage (cumulative stress resulting in an adjustment disorder, deteriorative patterns, concurrent acute schizophrenic disorder).
7. *Presenting circumscribed conclusions*. Presenting these in terms of accurate representativeness of the data base, diagnosed mental conditions, fitness to proceed, mental capacity, and imminent dangerousness, the last only if an exculpatory mental condition is proffered.

At the very least, the above seven-step procedure will, in the author's experience, communicate to the court that the forensic evaluator was comprehensive and willing to share his or her decision process. This approach emphasizes the all-important connection between a diagnosed mental condition, causing a disorder in executive functions and alleged offense responses. Finally, this approach is open-ended, in contrast to the usual advice to render short, terse reports that present only conclusions and exclude the basis of the evaluator's reasoning process and content.

A final observation about disorders of executive functions is that the current *Zeitgeist* in this country appears to be one of limiting volitional impairments (i.e., motor output) in favor of assumed cognitive deficits (e.g., thought disorders, suicide ideation). Federal jurisdictions have dropped the volitional arm of the American Law Institute (ALI) guidelines. Others that use the M'Naghten type of insanity defenses focus on all-or-none cognitive impairment.

Attempts to limit the insanity defense may be unreasonable for two intertwining reasons. First, to exclude volitional impairments violates contemporary conceptualizations about brain-behavior relationships. From a neuropsychological perspective, this is tantamount to saying that some brain lesions are morally superior to others, such that temporal lobe, or brain stem damage, for instance, is possibly exculpatory, while damage in the regions of the brain that deal primarily with executive functions are not.

Second, the forensic evaluator should remember that even primarily cognitive impairments must always be expressed through overt behavior because it is the only manner by which those impairments can be observed or deduced. Cognitive impairments are second-order inferences derived from possible behavioral aberrations. All cognitive impairments, therefore, presuppose volitional impairments in the sense that problems in thinking must be reflected through behavioral responses.

American and English appellate cases reflect a rudimentary judicial decision-path in regards to mental incapacity. It is based on the belief that cognitive impairments, as mental elements in thinking and intent, always imply behavioral impairment, but not the reverse. Thus, florid

psychosis, gross encephalopathy, dissociative states, mental retardation, and other mental conditions wipe out cognition as well as volition. Yet, it is possible to have impaired volition (e.g., due to frontal lobe dysfunction or other organic states) and still have intact cognition. Theoretically, it would be more parsimonious and scientifically pure to remove the cognitive arm of the ALI test and leave volition as the focus of inquiry.

Mens rea, or evil intent, surely presupposes the ability to carry out those intended actions. How else can criminal responsibility be assigned or even implied? Until judicial wisdom catches up to the current thinking in the science of brain-behavior relationships, it may be necessary for the forensic evaluator to expand the meaning of "appreciation" in truncated versions of ALI tests of insanity to include behavior, affect, and ability to modulate behavior, as well as cognitive activity. For does it not affect appreciation of wrongdoing if one is unable to exercise self-control over one's behavior, modulate extremes of emotion, or engage in reasonable or productive behavior? Compelling questions such as this are expected to reoccur in the literature as neuropsychological information is increasingly applied to forensic settings and situations.

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