

**QUALIFICATION OF NEUROPSYCHOLOGISTS AS EXPERT WITNESSES
REGARDING ISSUES OF NEUROPATHOLOGICAL CAUSATION**

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ABSTRACT

An overview of the utilization of expert witnesses and the rules related to the admission of expert witness testimony were presented. An analysis was undertaken of the rules and court decisions related to the qualification of neuropsychologists as expert witnesses regarding the issue of neuropathological causation. The value and limitations of neuropathological etiological determination of central nervous system pathology was reviewed. Arguments for the application of the Federal Rules of Evidence, and its state equivalents, to the qualification of neuropsychological experts regarding neuropathological causation were presented. A protocol for the qualification of expert witnesses regarding issues of neuropathological etiology were offered.

Introduction

In this era of major scientific technological progress, the unique position of the expert witnesses is of indispensable importance. Expert opinions contribute one of the most specialized areas of scholarship to the American legal system. The expert opinion contributes to the capacity of the finder of fact to make intelligent decisions where the laymen would otherwise be unqualified to do so. It is not unexpected that numerous issues arise out of the utilization of expert witnesses.

Clinical neuropsychology as a scientific field of study is uniquely suitable for educating the fact finder as to many noteworthy issues in the courtroom setting. Neuropsychology can be broadly defined as a branch of the field of psychology which studies the conventional areas of psychology (behavior and the underlying mental processes behind it) in the context of the neural and biochemical mechanisms entailed in those processes (Feinberg & Farah, 1997).

The neuropsychologist can render valuable support in characterizing and assessing the etiology, neurobehavioral effects and prognosis of neuropathology. The forensic neuropsychologist's declarations, including those pertinent to employment, academic, physical and social functioning; often have a significant influence on legal decision-making.

Neuropsychological testimony is utilized in administrative decision making; including, but not limited to, the determination of disability eligibility. Neuropsychological testimony can substantially affect judge and jury decision making as to the determination of fault, causation and the amount of damages in civil litigation cases. Neuropsychological testimony regarding disability attributable to neurological impairment can have a significant impact on determinations of legal competencies of a defendant. These competencies can thereby affect an individual's capacity to make legally valid decisions (e.g., competence to create a will, competence to contract) or participate in various legal processes (e.g., competence to stand trial, competence for a death sentence). The effects of neuropathology on a defendant's *mens rea* (intent) during the commission of a crime can affect the level of their legal culpability for their criminal actions. Neuropsychological testimony can greatly persuade judge and juror decision-

making related to guilt, sanity, and sentencing issues. Due to the jurisprudential value of neuropsychology, it has become increasingly accepted by both case law and statute.

Although the utilization of the forensic neuropsychological expert witness has been steadily expanding for the last few decades, it has attracted criticism. Such criticism has led to limitation by some courts and legislative bodies as to the admissibility and qualification of neuropsychological expert testimony.

These criticisms have been proffered and utilized as reasons to deny admissibility of neuropsychological testimony in the legal system, especially in the area of negligence claims for neuropathological injuries.

Negligence claims for neuropathological injuries have become an ever increasingly significant part of the civil litigation landscape (Sweet, 1999). Frequently, such cases require the testimony of an expert on matters of causation and the neurobehavioral sequelae of the asserted injuries.

Clinical neuropsychology as a discipline is distinctively appropriate for speaking to these issues. The legal system has become increasingly accepting of neuropsychological expert witness testimony as to the element of damages, yet has been much more reluctant in qualifying neuropsychological testimony as toward the causation of such damages.

Numerous courts have applied qualification standards particularly to neuropsychological expert testimony as to both damages and causation. Due to judicial discretion in the admissibility and qualification of expert witness testimony, appeals are frequently denied as to the issue of exclusion of neuropsychological expert witness testimony. Frequently, judges' decisions are correctly based on the standard applied, and other times the standard is misapplied or an improper standard is applied. As the American judicial system applies the rule of *stare decisis*, it gives precedential value to prior decisions creating case law. It would be regrettable if the unjustifiable categorical exclusion of helpful, and at times necessary, expert testimony were to become the rule of law.

The Federal Rules of Evidence (FRE) (accepted by the large majority of jurisdictions) have laid down the general requirements for the qualification of expert witnesses. The law requires that for any expert witness, including neuropsychologists, to be qualified regarding any issue, two requirements must be met. First, the expert must have the necessary experience. That is, the expert must have knowledge or skill in a particular area that distinguishes him/her from an ordinary person. Second, the expert's testimony must concern a topic that is so specialized that without the testimony, the jury would be less able to reach an accurate conclusion. FRE 702 incorporates by precedent the Daubert standard which considers the validity and reliability of the science underlying the basis for the testimony and the qualifications of the individual offered as an expert in that science.

A number of courts have qualified neuropsychological expert testimony regarding issues of causation. The courts have done so on three principle theories. First, some courts properly consider the education and experience of individual neuropsychologists in regards to its relevancy to the issue of causation (Huntoon v. TCI Cablevision of Colorado, Inc., 1998; Landers v. Chrysler Corp., 1997). Second, some jurisdictions have held neuropsychological expert witnesses qualified to testify regarding brain injury causation based on the reasoning that physicians may, and frequently do, utilize data based on the findings of neuropsychologists as the basis for their expert witness testimony regarding the causation of neuropathology, and therefore, admission of the same neuropsychological data by a neuropsychological expert witness would only educate the fact finder more directly than if it were presented by a physician (Valiulis v. Scheffels, 1989). These courts conclude that the rules pertaining to qualification contain no restraints against a psychologist or neuropsychologist testifying regarding neuropathological causation. Such jurisdictions highlight the liberal design for which the rules were legislated. Third, other courts conflate the issue of qualification with admissibility based on validity and reliability of the underlying scientific basis and hold neuropsychological expert witnesses as qualified on the basis of such standards (e.g., *Daubert, Frye*).

A number of other courts have disqualified neuropsychological expert testimony regarding issues of brain injury causation. The courts have done so on two principle theories.

First, just as in cases where neuropsychological expert witnesses have been qualified, courts have improperly applied specific standards of admissibility (e.g., *Daubert, Frye*) frequently in ignorance of the neuropsychological evaluative process to disqualify neuropsychologists from testifying about issues of brain injury causation.

Second, other courts have held neuropsychological experts unqualified based on statutes either explicitly or implicitly defining the bounds of psychological practice. Such courts frequently hold that the causation of neuropathology and its behavioral sequelae are a matter of “medical causation” and therefore falling outside of the statutory limits of psychological practice and or competency. Frequently, these courts do not distinguish between psychological and neuropsychological qualification.

A substantial body of research indicates the validity and reliability of neuropsychological assessment and decision-making (Sweet, 1999). Rather than to deny neuropsychology’s admissibility in the whole regarding any issue, as in all sciences, judgments of admissibility should lie along a continuum as do actual reliability and validity; well established knowledge should be admitted, and novel, less established, valid and reliable knowledge should be more closely scrutinized as to its decision making value. Neuropsychology should be judged according to the same standard as all sciences. In the aggregate, the problems forensic neuropsychology face as a legally utilizable science are not problems of qualification, but rather ones of validity and reliability. Such issues are not unique to forensic neuropsychology, but are significant factors affecting the admissibility of all scientific expert testimony.

To increase proper judicial decision-making for the qualification of neuropsychological expert testimony regarding issues of neuropathological causation, as well as to educate neuropsychologists in giving judicially acceptable testimony, a general decision making protocol for the qualification of neuropsychological expert witnesses will be created.

CHAPTER I

Legal Bases for Forensic Neuropsychological Expert Testimony as to Causation

The Neuropsychologist as an Expert Witness:

The neuropsychologist can render valuable support in characterizing and assessing the etiology, neurobehavioral effects and prognosis of neuropathology. The forensic neuropsychologist's declarations pertinent to employment, educational and social issues often have a great influence on the value of a civil litigation case.

While other fields of study may also educate the fact finder as to the subject-matter associated with the claimant's functional disabilities, the stringency of a neuropsychological test battery consistently confers credibility and significance to forensic neuropsychological opinions advanced to the court in the form of reports and testimony. Nonetheless, to perform as a skilled forensic expert, it is not only necessary for the neuropsychologist to be competent as a clinician but furthermore be experienced in the particular considerations that are important for practicing within the legal setting. Of significant importance is at least cursory understanding of the systemic rules governing the admission of neuropsychological expert testimony. The following is a brief exploration of the rules governing admission of neuropsychological expert testimony.

Laws are constructed to supply formal proceedings for resolving disputes in society and to preserve order. By definition, any dispute will have conflicting or adversarial positions. Within this adversarial setting, it is the position of the fact-finder (*e.g.*, judge, jury) to determine which party's arguments are more persuasive or legally accurate. When a neuropsychologist undertakes the role of an expert witness, he/she becomes a character within the adversarial process.

Because of their special expertise and knowledge, neuropsychologists are permitted to testify in court as witnesses who are expert. Written documentation of medical testimony in jurisprudence dates back to 1311 (Eigen & Andoll, 1986). Originally courts applied expertise in two ways: First, jurors were chosen because of their special knowledge or experience concerning the problem before the court; second, skilled or knowledgeable people who were not jurors would advise the court by presenting their opinion for the court to weigh in its decision-making. It is this second application of expert knowledge that is contemporarily used, as the dual role of juror and witness is no longer in acceptance (Eigen & Andoll, 1986).

At this time expert witnesses are either retained by a party to a case or court-appointed. It is more probable that experts retained by one of the parties to a case will be more aggressively cross-examined than one who testifies at the request of the court.

Generally, the court allows the neuropsychological expert to render three discrete forms of testimony: expert evidence, expert opinion, and expert advice. The following is a description of each.

Expert evidence. American jurisprudence places evidence into three categories: object evidence, witness evidence, and expert evidence. Object evidence includes tangibles that may be introduced into court (e.g., a bloody glove, a gun, a contract). Witness evidence refers to personal accounts of what an individual has perceived during the commission/omission of an act. In contrast, scientific expert witness evidence is grounded upon observations gleaned through the scientific method (e.g., research), either outside of or after the incidence and facts of the case. The role of expert evidence is to educate the fact finder as to case relevant issues related to the discipline of the expert.

Expert evidence will only be admitted if it is found to meet the following elements: First, the subject-matter must be particularly associated with a valid and reliable science or profession that it is therefore outside the knowledge of the average person. In other words, the expert knowledge must be considered part of a distinct discipline, not merely common sense. Second, the expert witness must be qualified as an expert. An expert may be qualified if he is found to possess proficiency, scholarship, and experience in his purported field of expertise.

Expert Opinion. As a result of the assumption that the expert can regard the facts in his field of expertise proficiently, it is further accepted that, once qualified, the expert can identify the legal difference between fact and opinion. In neuropsychology, as in other disciplines, this somewhat ambiguous and artificial differentiation between fact and opinion is troublesome to preserve. In reality there is more of a continuum between fact and opinion than a dichotomy. The question becomes: Where does fact end and opinion begin?

Expert witnesses are the sole witnesses admitted to render opinion as opposed to other witnesses who may only present their perception of the facts. Legally, an expert opinion is considered to be a thoroughly conceived determination formulated from the scientific facts. Therefore, to submit an expert opinion, the neuropsychologist must evaluate the subject's mental and physical condition by reference to examination, testing, clinical history, experimental data and relevant literature. Neuropsychological opinion may be rendered on a number of issues including: 1) whether an individual has a cognitive, sensory-motor or emotional disturbance; 2) whether such disturbances conform to the alleged severity of the brain damage; and 3) character of a central nervous system injury, prognosis, and rehabilitative demands. Like expert evidence, to render an expert opinion, an expert's capacity to testify as to opinion must be grounded in scholarship and experience. When an expert testifies as to opinions, he is only assisting the fact-finder, rather than establishing the facts of the case. An expert may not decide the ultimate issue of the case, outside of federal practice in criminal prosecutions, the expert may give an opinion on the mental state of the subject, even if that is the ultimate issue in the case (Federal Rule of Evidence 704, 2000).

Expert Advice. Lastly, a court may request an expert to render his professional advice, based on scholarship and experience, as to actions to be made by the court. For the neuropsychologist, this advice may take the form of advice concerning sentencing issues, or in the case of therapeutic jurisprudence, treatment options.

Admissibility. Controversy has arisen over the utilization of expert witnesses, their impression upon jurors, and the standards that rule the admissibility of expert testimony. Until recently, the controversy has been chiefly theoretical, however, a corpus of pertinent empirical research on the use of expert witnesses is becoming established.

Initially enacted in 1975, the Federal Rules of Evidence (FRE) liberalized a number of the contemporary rules of evidence for the federal courts. One such domain of liberalization was the expansion of standards for the admissibility of expert testimony. The Federal Rules transformed the focus of the courts from issues of admissibility to issues of weight or credibility of the evidence (Mueller, & Kirkpatrick, 1995). Federal Rules of Evidence 702 and 703 are the central rules governing the admission of expert testimony. The great majority of states, have adopted the FRE.

FRE 702 states, “If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise” (Federal Rule of Evidence 702, 2000). In other words, under FRE 702, expert testimony must meet at least two requirements to be qualified. First, the expert must have the necessary experience. That is, the expert must have knowledge or skill in a particular area that distinguishes him/her from an ordinary person. This expertise may come from either education or experience. Second, the expert’s testimony must concern a topic that is so specialized that without the testimony, the jury would be less able to reach an accurate conclusion (Mueller, & Kirkpatrick, 1995). Most experts derive their expertise from both education and experience, but either will suffice if it makes the witness more knowledgeable about a specialized field than a layperson. For example, in U.S. v. Johnson (1978) the court held that expertise may be obtained by experience alone, thereby qualifying prosecution expert witness as expert in marijuana identification due to having smoked it over 1000 times, dealt in it 20 times, and identifying its origins on over 100 occasions). However, for purposes of this discussion, only the scientific expert whose expertise is based on formal education and credentials in a scientific field, who will give a scientific opinion based upon that knowledge, will be discussed.

Implicit in the requirement of FRE 702’s phraseology “will assist the trier of fact to understand the evidence or to determine a fact in issue,” is FRE 401’s requirement that the evidence be relevant (Mueller, & Kirkpatrick, 1995). “‘Relevant evidence’ means evidence having any tendency to make the existence of any fact that is of consequence to the determination of [the issue] more probable or less probable than it would be without the evidence” (FRE 401).

Traditionally, the subject matter of the expert testimony had to be so specialized that it was “beyond the ken” of laymen (Mueller, & Kirkpatrick, 1995). But the Federal Rules illustrate the modern trend that the expert’s testimony must merely be “helpful” to the jury’s understanding of the case (FRE 702). This requirement will generally be found to be satisfied where the issue is a technical one, but where the matter is one that juries and ordinary people are often called upon to evaluate, the requirement may be found not to be satisfied (Mueller, & Kirkpatrick, 1995).

FRE 703 states:

“The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.”

In other words, the expert witness must have a reasonable basis for his opinion.

The Federal Rules do, however, provide the basis for some exceptions. FRE 403 gives the trial judge the power to discretionarily exclude testimony if “...its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence” (Mueller, & Kirkpatrick, 1995).

For the bulk of scientific expert testimony, the underlying scientific basis is well recognized as valid and reliable science. In such cases, the standards required by the FRE (e.g., expert qualification, helpfulness to the jury and adequate basis) are sufficient. However, in other cases in which scientific expert testimony is sought to be offered, the novelty or controversial nature of the testimony to be offered can require that the science be properly validated before the court. This requirement is linked to FRE 702’s requirements of helpfulness and expert qualification.

In the case of Daubert vs. Merrell Dow Pharmaceuticals, Inc. (1993), it was held that federal courts must inquire into the “scientifically validity” and “scientifically reliability,” of a test or principle when the results of a novel or controversial scientific test or principle are sought to be introduced by the proponent. Daubert affirmed the principle that scientific evidence may necessitate a balancing of the probative force of such testimony against its tendency to be misleading. The federal courts must consider the following factors when deciding whether the test or principle is “scientifically valid”: whether the test or principle can be reliably tested; whether the test or principle has been subjected to peer review and/or publication; whether the test or principle has a reasonably low error rate; whether there are professional standards controlling the test’s or principle’s operations; whether the test or principle is generally accepted within its’ field; and whether the test or principle was developed for purposes other than merely to produce evidence for the present litigation (Mueller, & Kirkpatrick, 1995).

Unfortunately, the validity principle requires a case-by-case analysis. The infinite complexity of reality, and therefore, the infinite possibilities for the scientific explanation of phenomena do not, by its very nature, permit for an easily applied definitive rule for the dichotomous task of judicial determination of legal validity. The judicial system is therefore left with the difficulty of having courts that are inadequately prepared to make autonomous determinations of scientific validity. Therefore, courts must rely on the scientific community's methodological scrutiny to determine validity.

Once the courts have sufficiently scrutinized the validity or invalidity of specific methods or techniques for the determination of scientific opinion in prior decisions, judicial notice of the evidence's status for admissibility may be taken. In other words, when enough courts have consistently determined the validity of a scientific method/technique, it is no longer necessary for the court to reexamine the scientific scrutiny of the underlying scientific basis of the case specific scientific evidence. The most significant problems posed by this ruling are the constantly evolving nature of scientific understanding and the impossibility of formulating a single scientific method with a universally applicable set of procedures and criteria for judging new theories or ideas in all fields of science.

For more than seventy years, the Frye rule, in Frye v. United States (1923), had predominated. This rule holds that before an expert would be accepted by the court as qualified to give an opinion, the underlying scientific knowledge the expert claimed to possess or the technique the expert used would have to be shown by the proponent to be *generally accepted by the relevant scientific community*. The Frye rule was the federal standard from 1923 to 1993. Most states adopted the Frye rule between 1930 and 1950. Until the 1970's this rule was considered settled law and engendered no particular controversy. While various courts have instituted their own jurisdictional standards for the offering of scientific evidence, much of these standards have commonly been grounded on Frye. Since Daubert declined inclusion of the Frye standard into the FRE (which have been adopted by the vast majority of states) and a long history of jurisprudential criticism, Frye's judicial lifetime appears to be coming to an end.

The implications of Daubert for state courts is until this moment not altogether apparent. However, a significant number of states have already adopted the Daubert standard, and a minority of jurisdictions were already employing less demanding standards of admissibility than Frye for the admission of scientific and technical evidence previous to the Daubert decision. A number of state jurisdictions are currently undertaking the process of examining standards of admissibility to ascertain whether they ought to be shaped as more inclusive. A small collection of other states are choosing to preserve the Frye standard or a near variation of it (Hominik, 1995). Although state courts are not required to follow Daubert, some states have already done so at the highest-state-court level (e.g., Iowa, Montana, and South Dakota), while in others, lower courts have followed the decision (e.g., Illinois)(Dreyfuss,1995). However, a few courts have flatly rejected the Daubert decision (e.g., Arizona, Florida, Minnesota & Nebraska)(Dreyfuss, 1995; Knapp, 2000).

Consequently, numerous state courts and court litigators are being compelled to manage all of the typical difficulties intrinsic to psychiatric and psychological evidence along with the novel issues generated by the Daubert decision. These problems include issues such as which standard of admissibility is controlling and the application of such a standard as to miscellaneous forms of psychiatric or psychological evidence. Subsequent to Daubert, judges have an expanded gatekeeper's function, with increased discretion toward the admission or exclusion of expert evidence. The level with which individual judges will question the validity and utility of psychological or neuropsychological expert testimony continues to be an issue to be resolved in many jurisdictions.

Although Daubert does not explicitly differentiate between expert testimony grounded on “soft” science such as psychology or neuropsychology and testimony grounded on a “hard” science such as biology, a minority of other decisions have tended towards this position. This differentiation is established upon the assumption that jurors are not as convinced by opinions rooted within the social or behavioral sciences. It is assumed that jurors are able to separate “the wheat from chaff” in such testimony (Barefoot vs. Estelle, 1983).

A number of courts presume that jurors appraise the credibility of experts in accordance with the expert's domain of expertise. In Barefoot, a state's psychiatric expert testified that the defendant, a convicted murderer, was exceedingly prone to engage in violent behavior. The defendant was consequently condemned to death subsequent to his sentencing hearing. The defense's argument, that the overwhelming majority of empirical research did not sustain a position of psychiatric and psychological expertise in predicting future dangerousness was denied by the Court, assuming that “all of these professional doubts about the usefulness of psychiatric predictions can be called to the attention of the jury,” allowing “the adversary system to sort out the reliable from the unreliable evidence and opinion about future dangerousness...” (Barefoot vs. Estelle, 1983). The Court did not subject the testimony to the Frye standard of “general acceptance within the relevant scientific community” or independent rigorous judicial scrutiny of the science underlying the opinion. It continued on the theory that the jury could comprehend and evaluate the testimony and thereby adopted the standards of admissibility that govern all evidence.

The Supreme Court, once again, addressed expert testimony on a similar vein in Daubert vs. Merrell Dow Pharmaceuticals, Inc. (1993). Despite the fact that plaintiffs' experts were equipped to testify that the drug Bendectin could give rise to prenatal abnormalities, the District Court granted summary judgment for the defendant. It did so with the rationale that the expert opinion testimony was inadmissible owing to a multitude of published studies that had not found such a relationship. Plaintiffs' experts based their opinions on animal studies, the chemical structure of Bendectin, and a reanalysis of a published epidemiological study. The Ninth Circuit Court of Appeals affirmed on the ground that the general acceptance standard required such opinion to be derived from studies published in the peer-reviewed, scientific literature (Daubert vs. Merrell Dow Pharmaceuticals, Inc., 9th Cir. 1991). Without mentioning Barefoot, the Supreme Court remanded the case back to the San Francisco appeals court with the instruction

that the judges should take a more active "gatekeeping role" in screening courtroom science. Judges were to act independently in assessing evidence, using only relevance and reliability as their guides. In other words, the judge determines whether the expert's underlying reasoning or methodology is scientifically sound, but the judge should not focus on the conclusion of the expert witness. Daubert, which dealt with "hard" science, consequently requires an immensely more rigorous test for the admissibility of expert testimony than Barefoot, which dealt with soft or social science. Since the Daubert holding in 1993, courts have begun to apply its standard to the "soft" sciences. For example, in United States v. Smithers (2000) the court's opinion includes an exhaustive evaluation of numerous cases in which psychological expert evidence on the reliability of eye-witness identification has been reviewed by U.S. Courts of Appeal post-Daubert, applying the Daubert standard to the need for such testimony at trial.

The rationale for admission of "soft" science is related to the assumption that jurors are ingenious enough to recognize the limitations of "soft" but not "hard" science. This rationale is implicit in Barefoot and Daubert. Nonetheless, more explicit expressions of this perspective can be found elsewhere. For example, it has been maintained that no matter the circumstances, experts that build their testimony on the physical sciences create little risk of jurors becoming overly absorbed in the testimony of the psychiatric and psychological expert witnesses. This is due to jurors skepticism of the scientific qualifications of these fields (Bonnie, & Slobogin, 1980; McCord, 1987).

A number of state supreme courts manifest the same view. For example, in People v. Beckley (1990) it was held that distinct from other scientific evidence, expert testimony by a psychiatrist on the characteristic behavioral patterns of a sexual abuse victim was admissible without respect to general acceptance. In People v. McDonald (1984) it was held that the trial court erred in excluding expert psychological testimony about the conditions that predispose erroneous eyewitness identifications, relying on the presumed capacity of the jury to view such testimony with a "healthy skepticism" that would be lacking "when the evidence is produced by machine." The court's conclusion relied on the assumption that jurors are inclined to attribute an exceedingly high level of confidence to evidence derived from seemingly "scientific mechanism, instrument[s], or procedure[s]."

The implicit and at times explicit assumptions of the previous cases and literature are that once an expert witness has been qualified and the testimony has been admitted, the jurors can understand and assess the evidence and merely apply the standards of relevance that govern all evidence (Federal Rules of Evidence 401, 402, & 403, 2000).

Therefore, to render neuropsychological expert testimony in court it is not only essential to be an expert in neuropsychology, but also to be an expert in presenting evidence (Blau, 1984; Satz, 1988). Courtroom proceedings are such that neuropsychological testimony can be submitted to meticulous scrutiny, which may make manifest discrepancies in assumptions and reasoning, breaches in knowledge, biases, or simple ignorance. If neuropsychologists are to be welcome participants in furthering justice, it is incumbent for them to have, at the least, a basic

understanding of the context they will be joining in and the rules with which their words and actions are bound. A deficient performance in court can have far reaching implications, not only for the individual neuropsychologist's reputation, but in addition, for the admission of neuropsychological testimony as a whole. A case specific court decision can establish a general principle under common-law, one court's decision can therefore affect the admissibility of psychological testimony in other courts.

Conclusion. In essence, all federal courts, and the great majority of state courts, are required to apply the FRE (or its state equivalent) and the Daubert standard to the qualification and admissibility of scientific expert witness testimony. FRE 702 essentially requires that a court may allow an expert witness to testify if the testimony will be relevant to the facts at issue, the expert's testimony will be helpful to the trier of fact in its determinations, and the expert be qualified by experience or education in a particular area that distinguishes him/her from an ordinary person. Linked to the FRE 702's requirements of helpfulness and expert qualification is Daubert's requirement that courts must inquire into the "scientific validity" and "scientific reliability," of a test or principle when the results of a novel or controversial scientific test or principle are sought to be introduced by the proponent. Finally, FRE 703 requires that the expert witness must have a reasonable basis for his opinion. Essentially, these rules require a two-step process. First, the expert witness must be qualified as having the education and/or experience to be helpful to the trier of fact in the determination of an issue. Second, the underlying basis for the scientific expert's testimony must be scientifically valid and reliable. As the breadth of these issues is too great to be dealt with in this dissertation, and due to the duality of the issues in terms of judicial holdings; it is to the issue of qualification of the neuropsychological expert witness that this dissertation will be mainly concerned. However, due to the interrelated nature of qualification and scientific validity in both the FRE (and its state equivalents) and their conflation by a number of courts, the issue of the scientific validity of neuropsychology will be discussed throughout.

The Role of the Clinical Forensic Neuropsychologist:

Clinical neuropsychology as a discipline is distinctively appropriate for speaking to many noteworthy issues in the forensic arena. The neuropsychologist can render valuable support in characterizing and assessing the important neurobehavioral sequelae of physical pathology. The forensic neuropsychologist's declarations, including those pertinent to employment, academic, physical and social functioning; often have a significant influence on legal decision-making. Neuropsychological testimony can substantially affect judge and jury decision making as to the determination of fault, causation and the amount of damages in civil litigation cases. The effects of neuropathology on a defendant's *mens rea* (intent) during the commission of a crime can affect the level of their legal culpability for their criminal actions. As such, neuropsychological testimony can greatly persuade judge and juror decision-making related to guilt, sanity, and sentencing issues. Due to the jurisprudential value of neuropsychology, it has become increasingly accepted by both case law and statute. A recent national survey of neuropsychologists exemplified this fact by its finding that more than half of clinical

neuropsychologists have testified at least once in their careers and nearly one-fifth have done so at least ten times (Guilmette, 1991).

Role in the Criminal System. In criminal cases the prosecution must convince a judge/jury *beyond a reasonable doubt* that the statutory elements of a crime were met by the action/inaction of the accused defendant. These elements generally include an *actus reus* (an act) and *mens rea* (intent).

Some crimes, however, do not require an intent, such as involuntary manslaughter. Involuntary manslaughter usually only requires a reckless disregard. Neuropsychological expert witnesses will usually be called in criminal cases to help a party prove a defendant's capacity for forming intent/lack thereof to a judge/jury. The use of neuropsychological expert witnesses in the criminal context is usually relegated to cases in which brain dysfunction is the basis for an insanity defense.

Role in the Civil System. In the context of civil jurisprudence, there are numerous ways in which the neuropsychologist can play an important role.

The most common type of civil litigation a neuropsychologist will be called to play a role in is tort litigation. A tort is a private or civil wrong or injury resulting from a breach of a legal duty that exists by virtue of society's expectations regarding interpersonal conduct, rather than by contract or other private relationship (Barron's Law Dictionary, 1996). The most commonly litigated tort in which a neuropsychologist will perform a function is a negligence action. The essential elements of negligence are:

- a. Duty: a legal duty owed by a defendant to a plaintiff
- b. Breach: a failure to perform a duty owed to another or to society by failing to exercise that care which a **reasonable person** [*emphasis added*] would exercise under similar circumstances.
- c. Causation: Generally, the active, efficient cause that sets in motion a chain of events that brings about a result without the intervention of any other independent source.
- d. Damage: Any wrong or damage done to another, in either her/his person, rights, reputation, or property. (Barron's Law Dictionary, 1996).

Neuropsychologists are most frequently involved in torts cases of personal injury or medical malpractice to assist a party in proving/disproving causation and/or the existence/non-existence and extent of damages. The neuropsychologist's capacities can also be involved in numerous contexts within a torts case, one example could be assisting a party in proving/disproving mental capacity of a defendant to shift fault to another party/individual.

The neuropsychologist can play a role in numerous civil contexts outside of the torts context. Forensic neuropsychologists have been utilized in the determination of legal competency, including an individual's capacity to make legally valid decisions (e.g., competence to create a

will, competence to contract) or participate in various legal processes (e.g., competence to stand trial, competence for a death sentence). Utilization of forensic neuropsychology in administrative decision making includes the determination of disability eligibility. Other areas in which neuropsychologists have been used include contract cases, disability cases, and workers compensation cases. However, as the great majority of neuropsychological expert testimony in the forensic arena is within negligence actions it has therefore generated the most law in that context.

Case Law on the Qualification of Neuropsychological Expert Witnesses:

A multitude of cases have involved issues of qualification of clinical psychologists as expert witnesses on questions of mental condition or competency. The field of clinical neuropsychology is young, even compared to its relatively young progenitor, clinical psychology. Although, neuropsychology can be viewed as a distinct discipline, the legal community has frequently viewed it as merely another branch of psychology. This may suggest to some in the legal community that experts in the fields of neuropsychology and clinical psychology should be treated similarly, if not identically. However, as neuropsychology becomes a burgeoning area of research and practice, questions of neuropsychologically specific importance are becoming ever increasingly present in the legal decision making process. It seems, however, that the utilization of the neuropsychologist in contemporary society is expanding and that with this will arise an intensifying propensity to summon the neuropsychologist as an expert witness on issues of mental condition or competency (Sweet, 1999).

Clinical psychologists have regularly been held as qualified to testify as to psychological assessments, together with the protocols, results, and interpretations of their results. The only disqualifying factor in such cases has been the deficient qualification of a specific psychologist or the cumulative effect of psychological testimony where sufficient testimony has already been given.

In the criminal context, there is a split of authority as to the issue of whether a psychologist may testify as to the actual mental state or condition of a subject or to whether the subject was legally sane or insane at a specific point in time. Although some jurisdictions exclude such testimony *carte blanche*, other jurisdictions take a more case specific direction. These “case specific” jurisdictions ascertain qualification to testify as to mental state or condition by considering factors such as the qualifications of the particular psychologist and the basis from which the expert opinion was formed.

Psychologists have also been qualified as expert witnesses in civil proceedings. Psychologist’s expert testimony regarding an individual’s mental state or condition has been admitted in numerous contexts including proceedings for disability compensation such as insurance or workers' compensation, competency or commitment proceedings, personal injury litigation, and child custody proceedings. Psychological and neuropsychological expert witnesses have been qualified to testify as to the existence, cause, and effect of mental condition or state in such cases.

Such testimony has been permitted regarding a plethora of conditions including, but not limited to, aphasias, emotional distress, anxiety, phobias, learning disability, multiple sclerosis, organic brain injury, headaches, schizophrenia and other nonspecific conditions. There is however, at least as it concerns organic brain injury, authority from a minority of jurisdictions characterizing psychologists, including neuropsychologists, without express medical education and training as unqualified to offer expert testimony as to the causation of such conditions.

For criminal culpability. Although psychologists have frequently been qualified to testify regarding a defendant's mental capacity at the time of the crime, there is little case law as to the qualification of neuropsychologists for such purposes.

In State v. Middlebrooks (1998) the trial judge admitted the testimony of two psychologists during a homicide case. One psychologist had performed psychological and neuropsychological assessments of the accused. The psychologist concluded that the accused had a diagnosis of chronic borderline personality disorder with antisocial and schizotypal traits. In addition, the psychologist found the accused to be suffering from a mild functional brain impairment. Another psychologist performed the Minnesota Multiphasic Personality Inventory (MMPI) upon the accused. The psychologist also concluded that the accused was suffering from a personality disorder, however, that the accused was magnifying the degree of his problems. The psychologist also testified that the accused was competent to stand trial and was lacking the foundation for an insanity defense.

In Com. v. Monico (1986) where the defendant was accused of committing homicide, the appeals court held that it was a reversible error for the trial judge to exclude expert testimony by a neuropsychologist as to the defendant's purported mental disease or defect for the reason that the neuropsychologist was not a physician. The criteria adopted by the court in deciding the admissibility of the expert's testimony were the expert's actual experience and the probable probative value of his testimony. In this case, the expert was a clinical neuropsychological consultant who was "eminently qualified in the field of neurological dysfunctions;" and who held both bachelor's and master's degrees in psychology and, at the time of the trial, "was submitting his dissertation in psychology to obtain his doctorate." In addition, the expert had assessed over a 100 patients with brain injury in the course of his training, as well as, taught neurology at Harvard Medical School. The court held that the expert's skill, knowledge and education, in addition to, his comprehensive testing of the defendant was sufficient basis to admit his testimony concerning the defendant's mental state at the time of the commission of the alleged crime. The expert witness testified that the defendant did indeed suffer from a neuropathology that could have caused the defendant to be unaware of his deeds during the commission of the crime.

Presence of Organic Brain Injury. Since 1980, courts have universally found that neuropsychologists (and psychologists) are qualified as experts for purposes of testifying about the existence of organic brain conditions or injuries (Richardson, & Adams, (1992).

Qualified. The subsequent cases are comprised of personal injury litigation or disability compensation eligibility proceedings which held that psychologists/neuropsychologists were qualified as experts to testify regarding the existence of a brain injury.

In Huntoon v. TCI Cablevision of Colorado, Inc. (1998), a personal injury suit involving a motor vehicle accident (MVA), the court held that a neuropsychological testimony was admissible as to the existence of a brain injury. The court based its decision on the facts that the neuropsychological expert witness had examined the individual's history, including medical records and school records, and had conducted both neuropsychological testing and an individual interview of the individual in question.

In Gast v. City of Fountain (1995), a negligence case, a neuropsychologist was held to be qualified to testify as to the plaintiff's diagnosis of organic brain injury. The court based its decision on the following factors: 1) the neuropsychologist had conducted an assessment of the plaintiff at the request of physicians to determine whether a brain injury had occurred; 2) the neuropsychologist based his diagnosis on commonly used diagnostic observations of the plaintiff; 3) the neuropsychologist based his diagnosis on the plaintiff's history, including the plaintiff's school and medical records; 4) the neuropsychologist based his diagnosis on neuropsychological testing of the plaintiff; and 5) the neuropsychologist was familiar with the plaintiff and with the methods used to diagnose organic brain injury. The court found that Colo. Rev. Stat. § 12-43-209 (1991), charging a psychologist to collaborate with a physician to diagnose and treat medical problems, did not prohibit admission of the presented testimony.

In Phillips v. Lincoln National Life Insurance Co. (1992), the court looked to a neuropsychologist's diagnosis of organic brain syndrome as a factor in determining whether the beneficiary's disability was encompassed by the mental illness limitation of an ERISA plan.

In a case of aggravated assault, tried *in absentia*, State v. Hall (1983), a psychologist's testimony, that the appellant sustained brain damage due to alcoholism combined with former head injuries, was admitted.

In Kinsey v. Kolber, (1982), a personal injury case involving an MVA, it was held that a clinical psychologist's testimony that the defendant suffered from a chronic organic brain syndrome was properly admitted because he had based his testimony upon psychological test results of the defendant. The court reasoned that the expert was qualified because he held a master's degree and doctorate of psychology from the University of Illinois, and the majority of the expert's diagnostic work was comprised of neuropsychological testing of brain-injured patients, including an average of five or six brain injured patients per week for over 22 years. In addition, the expert had taken courses and conducted research in the areas of brain functioning and behavior, and taught brain function, biochemistry and physiology to neurologists. The court concluded that, because the psychologist's qualifications were "so thoroughly established, the fact that he did not have a medical degree was no bar to his testimony."

In a case involving personal injuries of a motorcyclist arising out of an accident with a tractor-trailer truck, Litton v. Home Indem. Co., (1980), psychological testimony that the plaintiff sustained organic brain damage and was not malingering was admitted. The plaintiff's diagnoses were based upon the tests of two psychologists who additionally testified that the plaintiff's brain injury led to the symptoms including anxiety, impulsivity, depression, and withdrawal.

The court held in Buckler v. Sinclair Refining Co., (1966), a personal injury suit, that a clinical psychologist with a doctoral degree, on the faculty of a university medical school, was qualified as an expert. The court declined to accept the argument that as psychologists are not medical doctors, and that they are unqualified as experts to the issue of the existence or diagnosis of organic injuries or conditions; and thereby admitted the expert opinion that the plaintiff was reacting to a brain injury.

Cause of mental condition. The prospect of neuropsychologists as expert witnesses has in recent times produced jurisdictional inconsistencies. As discussed above, courts do not seem to be questioning the neuropsychologist's capacity to testify as an expert witness on the presence of neuropathological concerns. Rather, courts have arrived at incongruous conclusions as to the issue of whether neuropsychologists are qualified as expert witnesses for the purpose of neuropathological causation issues. Although numerous courts have encountered the issue of psychologists and neuropsychologists testifying as experts about causation, there is a wide disparity among the decisions. While a majority of courts have instituted definitive rules either categorically qualifying or disqualifying neuropsychological expert testimony regarding neuropathological causation, other courts have taken intermediate approaches.

Qualified. The majority of jurisdictions permit neuropsychological testimony as to the causal relationship between neuropathological deficits and physical injuries. These jurisdictions examine their jurisdictional rule FRE 702 (or its equivalent) and conclude that the rule contains no restraints against a psychologist or neuropsychologist testifying regarding neuropathological causation. Such jurisdictions highlight the liberal design for which the rules were legislated. This approach is frequently rooted in the idea that "it would be somewhat anomalous to conclude [a psychologist] would not be qualified to testify about [the cause of plaintiff's injury] when the neurologist who sought his expertise and assistance in diagnosing the disease would most likely be qualified to do so." Valiulis v. Scheffels, (1989). There have been several other cases in which neuropsychologists testified regarding the organic basis for posttraumatic psychological changes that included some alteration of personality including, Lee's Mobile Wash v. Campbell (1993); May v. Industrial Com. (1990); Templeton v. Chicago & N. W. Transp. Co. (1993); and Swann v. City-Parish (1986).

Neuropsychologists Qualified. In Tomlian v. Grenitz (2001), a medical malpractice case, the plaintiff's argued that their baby had been brain damaged during delivery. The court held that neuropsychologists are not precluded from testifying as to the cause of brain injury recognizing that the Florida Legislature had broadly defined the practice of psychology in *section 490.003(4)*, Florida Statutes (1997).

In Huntoon v. TCI Cablevision of Colorado, Inc. (1998), a personal injury case involving a motor vehicle accident (MVA) the Colorado Supreme Court, *en banc* (when all the members of an appellate court are presiding), ruled that neuropsychologists are qualified to offer expert opinions on the physical causes of organic brain injury. Sharon Huntoon, the plaintiff, was involved in a MVA and subsequently started experiencing neuropathological dysfunction with short-term memory and other cognitive abilities. At trial, the court admitted testimony from a neuropsychologist that the MVA caused traumatic brain injury to Huntoon and that it left her with several areas of continuing neuropathological dysfunction. The court of appeals found that it was a reversible error to admit testimony regarding the cause of Huntoon's organic brain injury; holding that as a matter of law, neuropsychologists are not qualified to offer expert opinions regarding physical causation of organic brain injury. The state supreme court, reversed and reinstated the trial court's verdict and damages for Huntoon. According to the Colorado Supreme Court, Colo. R. Evid. 702 uses a two-part analysis for the admission of expert testimony: (1) Will the testimony help the trier of fact understand the evidence or resolve a fact in issue and (2) Is the witness qualified by knowledge, skill, experience, training, or education to support testimony in the form of an expert opinion. A witness may be qualified by virtue of any one of these five factors.

In Landers v. Chrysler Corp. (1997), a workers' compensation case, the claimant was hit on the head by a skyhook while loading engines at a Chrysler plant. He had a cerebral concussion and Post Concussion Syndrome. The claimant's clinical neuropsychologist performed a battery of neuropsychological tests, and interviews with the claimant and his wife. The expert neuropsychologist opined that the claimant suffered neuropathological dysfunction and clinical depression resulting from the head injury. The court found that the neuropsychologist was qualified to testify as to causation of organic brain damage. The court reviewed similar cases in other jurisdictions and stated:

The record supports the Commission's determination that Dr. Wetzel was qualified to testify as an expert as to the causation of claimant's injuries. Dr. Wetzel practices neuropsychology and is a full professor in neurology and in neurological surgery at Washington University School of Medicine. Dr. Wetzel has been published in medical journals and is a Fellow of the American Psycho-pathological Association. He teaches neurologists, neurosurgeons, and psychiatrists in the area of his expertise. Dr. Wetzel explained that clinical neuropsychology is the assessment, testing, and evaluation of people with disorders that may be psychiatric or related to a dysfunction in the brain. When it comes to assessing the cause and existence of brain damage, neurologists and neurosurgeons at Washington University School of Medicine come to Dr. Wetzel for both advice and training. Further, neurosurgeons rely on Dr. Wetzel to identify the area of the brain where surgery should be performed. One would be hard-pressed to conclude that Dr. Wetzel lacks the medical knowledge, skill, experience, or training simply because he is a psychologist and not a doctor of medicine.

In Adamson v. Chiovaro (1998), a case involving a motor vehicle accident (MVA), the court held that a doctoral level neuropsychologist was qualified to testify as to his opinion that the

neuropathological dysfunction the plaintiff experienced were the cause of the MVA, even though the neuropsychologist did not hold a degree in medicine. The court then held that the trial judge had the discretion to determine whether the neuropsychologist had the experience and credentials to qualify as an expert witness. The appellate court found that the trial judge's decision not to preclude the neuropsychologist from testifying as to his opinion was not an abuse of discretion. The court based its decision on the neuropsychologist's educational background, his status of director of the traumatic brain injury program at a prominent New York City hospital, and his faculty membership as a professor of rehabilitation medicine at that hospital.

In a case involving medical malpractice by a dentist, Cunningham v. Montgomery (1996), the court held it in error for the trial judge to deny admission of a neuropsychologist's testimony that the plaintiff's cognitive deficits were the result of nitrous oxide induced hypoxia during the plaintiff's treatment. The court stated that, although the neuropsychologist was not a medical doctor, due to her specialization and experience with hypoxic patients she was qualified to testify as to the causation of the plaintiff's cognitive dysfunction.

In Drake v. LaRue Constr. Co. (1995), Georgia overruled the common law prohibiting a neuropsychologist from testifying as to the causal relationship between organic brain damage and a mental condition. The court noted a recent statutory amendment defining neuropsychology as a branch of psychology, and expressly stating that the practice of psychology includes the "diagnosis of brain pathology through the use of psychological tests and assessment techniques."

It was held in Hutchison v. American Family Mut. Ins. Co. (1994), that a clinical neuropsychologist was qualified to testify as to the cause of a traumatic brain injury. In this case, the plaintiff, Hutchison, pursued damages suffered subsequent to a motor vehicle accident (MVA). The plaintiff suffered from cognitive and emotional difficulties allegedly caused from a closed-head injury that occurred due to the accident. The jury denied recovery, and an appeal ensued. The Hutchisons argued that the trial judge erroneously admitted the testimony of a clinical psychologist on behalf of the defendant, insurance carrier, regarding the alleged head injury. The plaintiff argued that it was an abuse of discretion to permit his testimony because the psychologist lacked medical board certification. In addition, the plaintiff argued that testimony regarding the head injury "involves medical causation, an issue on which...a clinical psychologist...cannot express an expert opinion." The court, citing case law, stated that "[t]here seems little dispute that a psychologist may testify as to the existence of a brain injury, or at least the condition of the brain in general." The court then distinguished a split in authority as to whether psychologists are qualified to testify as experts of causation. The court, nonetheless, concluded that it would not intrude upon the basic requirements of Iowa Rule of Evidence 702 (i.e., knowledge, skill, training, and experience); stating that the criteria for qualifications under Iowa Rule of Evidence 702 are too expansive to warrant discrimination grounded only upon an expert's proposed profession or particular degree.

In a case in which an employee was accidentally exposed to insecticides in his employer's greenhouse, Seneca Falls Greenhouse & Nursery v. Layton (1990), a neuropsychologist was held

to be qualified to testify that the employee experienced panic attacks due to his accident. The employer contended that the neuropsychologist was not qualified to offer testimony as to cause because she was not a medical doctor. The court disagreed.

In Valiulis v. Scheffels (1989), the court found that a clinical neuropsychologist who had been recognized as an expert in the diagnosis of multiple sclerosis by neurologists and psychologists was qualified to testify as to his opinion regarding the cause of the plaintiff's deficits. The expert neuropsychologist testified that the plaintiff's multiple sclerosis was caused, at least in part, from the accident. The court followed the reasoning that although the expert was not a licensed physician, it did not follow that he should be incompetent to testify as to an expert opinion where he was considered to be professionally competent to offer diagnostic opinions.

In Sanchez v. Derby (1989), an MVA case, the court held a neuropsychologist qualified to testify as to the cause of the plaintiff's behavioral changes. The neuropsychological expert testified that the changes were due to either an aggregation of post-traumatic stress disorder (PTSD) and as a result of chronic pain or due to organic-affective disorder secondary to an MVA caused traumatic brain injury. The court grounded its decision on the fact that the expert's opinion was based upon clinical interviews and neuropsychological tests, which are both tools utilized within the neuropsychologists expertise.

In a medical malpractice suit involving the a physician's miscalculation of a baby's delivery date and negligent inducement of labor eventuating in premature birth of the plaintiff, Fabianke v. Weaver By and Through Weaver, (1988), the court held that a clinical neuropsychologist with a postdoctoral fellowship in neuropsychology was appropriately permitted to testify that "the absence of mental retardation does not rule out the possibility of a specific learning disability" and that the child was "at an extremely high risk for any disability."

Psychologists Qualified. In Brannon v. Sharp (1989), a case involving an MVA, the appeals court held that the trial judge properly admitted the testimony of the plaintiff's expert psychologist. The psychologist testified that the plaintiff suffered from incapacitating headaches that were due to the MVA. The appellants argued that the expert's testimony should be excluded under *Ala. Code* § 34-26-1(b). *Ala. Code* § 34-26-1(b) requires that a psychologist may only diagnose or treat conditions falling within the practice of psychology. The appellants argued that the psychologist's testimony was toward the medical cause of the plaintiff's headaches and therefore, outside the practice of psychology. The court held that the expert psychologist's opinion went to "the cause-and-effect relationship between the accident and [plaintiff's] chronic pain," not to medical causation. The court noted that the psychologist specialized in treating patients with chronic pain and had treated the plaintiff for more than two years. The psychologist testified that during the course of treating the plaintiff, he was able to conclude that the plaintiff's headaches occurred only after being involved in the MVA; and the temporal proximity between the accident and the headaches logically lead to the conclusion that there was a cause and effect between the accident and the headaches.

In Jacobs v. Pilgrim (1988), a personal injury action, the court held the psychological expert testimony that the plaintiffs' difficulties were not due to brain damage was properly admitted, even though the psychologist based his opinion on tests performed by another psychologist. However, the Georgia court's holding in this case is conflicting with another Georgia case in which a neuropsychologist was held to be unqualified as an expert witness regarding issues of causation according to statutory interpretation of the Georgia psychology licensure laws (Chandler Exterminators, Inc. v. Morris, 1992).

In Westinghouse Elec. Corp. v. Lawrence (1986), the claimant purported that his psychological diagnosis was due to injuries received in an industrial accident. The court held that a clinical psychologist was qualified to testify as to the causal nexus between his mental difficulties and the accident. The appellants argued that the psychologist lacked the competency to testify as such, due to the fact that he was not a medical doctor. However, the court denied the argument, reasoning that the expert's opinion concerned the nexus between the claimant's injuries and the subsequent progression of a mental disorder and not the physical basis of brain damage.

In Spann v. Bees (1974), a personal injury case involving an MVA; the court held a forensic clinical psychologist with a Ph.D. in psychology, broad clinical experience, and diplomate status with the American Board of Examiners in Professional Psychology, was qualified to render an opinion as to the possible etiology of the findings of his clinical assessment of the plaintiff. The plaintiff suffered aphasia subsequent to being injured in an automobile accident. The court pointed out that Maryland had not embraced the more liberal perspective that a psychologist is qualified to testify as to the presence or absence of mental disease or defect. Therefore, the court resolved that it would have been an abuse of discretion for the trial judge to allow the witness to testify as to the ultimate cause of the plaintiff's intellectual deficits and personality change. In conclusion, the court held that the psychologist was qualified to testify as to his opinions and interpretations of the various tests he administered. This holding was however, superseded by statute. (Yount v. State, 1994).

Not Qualified. Other courts have expressly disqualified psychological or neuropsychological expert witnesses offered to testify regarding neuropathological causation. Such courts usually reason that psychologists and neuropsychologists do not possess the medical training essential to express an educated opinion pertaining to causation. In addition, several of the courts which prevent neuro/psychologists from testifying as to causation base their decisions on the jurisdictional statutes outlining the practice of medicine and psychology.

The courts in the following cases held that a psychologist/neuropsychologist is not qualified to render an opinion regarding the cause of organic brain injury.

Neuropsychologists Unqualified. In Martin v. Benson, (1997), a case involving a MVA, the court disqualified the use of a neuropsychologist to testify to the cause of the plaintiff's brain injury reasoning that in light of the psychology licensing statute, to do otherwise would allow psychologists to invade the realm reserved for the practice of medicine.

In Handy v. Speth (1993), a case involving an MVA, the court held that the trial court erred in allowing a neuropsychologist to testify as to the physical causation of the neuropsychological condition for which the plaintiff was tested.

In Chandler Exterminators, Inc. v. Morris, (1992), a case involving alleged negligence in the utilization of pesticides, the court held that the trial court did not abuse its discretion when it disqualified a neuropsychologist from testifying. The doctoral level neuropsychological expert testified to his opinion that the plaintiffs sustained brain damage as the result of inhalation of a chemical substance. The court quoted Ga. Code Ann. § 43-34-20(3), which determines the boundaries of the practice of medicine, and stated, that "...a psychologist is not qualified to render an opinion concerning a diagnosis of a mental disorder when such disorder requires a professional opinion as to a physical disorder"--here, organic brain damage." The appellate court held that the trial court did not abuse its discretion. Citing Ga. Code Ann. § 24-9-67, the court concluded that the trial judge has it within his discretion to determine whether an expert witness has such knowledge and experience in a science, profession, or art to be qualified as an expert witness.

The holdings in Handy and Chandler Exterminators, Inc. as regards the qualification of neuropsychologists to testify regarding causation has since been legislatively overruled by Georgia's amendment of O.C.G.A. § 43-39-1. It added paragraph (2), which defines the practice of neuropsychology as "the subspecialty of psychology concerned with the relationship between the brain and behavior, including the diagnosis of brain pathology through the use of psychological tests and assessment techniques." Former paragraph (2) was redesignated as paragraph (3), and it now defines the practice of psychology so as to include "diagnosing and treating mental and nervous disorders and illnesses, rendering opinions concerning diagnoses of mental disorders, including organic brain disorders and brain damage."

Psychologists Unqualified. In Edmonds v. Illinois Central Gulf Railroad Co. (1990) the Fifth Circuit, likewise, relied on definitions of psychology so as to ascertain an expert's qualification. The court held that the expert witness, a clinical psychologist, had "specialized training in the application of psychological principles to the assessment and treatment of people with psychological problems," and that the psychologist was "not a medical doctor, and not involved in making medical diagnosis." Therefore, the court concluded the psychologist's testimony regarding causation was outside the realm of psychological expertise and extended no assistance to the fact-finder.

In GIW Southern Valve Co. v. Smith (1986), the court held that a psychological expert witness is qualified to give opinion testimony as to the presence of a mental disease or condition, including organic brain damage; however, such a witness may not give an opinion as to a particular

accident's possible future effects upon an individual's brain. The court held this causal testimony to be the subject of medical expertise.

In Kriewitz v. Savoy Heating and Air Conditioning Co., 396 So. 2d 49 (Ala. 1981), in a case involving allegedly improper installation of a gas furnace that led to the release of carbon monoxide fumes into the plaintiff's house, the court held it proper for the trial judge to deny admission of a psychologist's testimony as to the medical cause of the plaintiff's organic brain injuries. The court cited Ala. Code § 34-26-1 which prohibited testimony of psychologists outside their area of expertise. Specifically, the psychologist was held to be unqualified to testify as to the causal relationship between the plaintiff's neurophysiological injuries and the plaintiff's carbon monoxide poisoning. The court held this causation testimony to be the subject of medical expertise.

Intermediary Decisions. Between the two more extreme positions, a minority of courts have cultivated more intermediate approaches to deciding the issue of psychological qualification to testify as to neuropathological causation. There are no such cases specifically regarding neuropsychologists. Such approaches include: (1) forbidding psychologists from testifying as to medical causation, however, concluding that such testimony, if offered, was harmless error, e.g., Haas v. Seekell (1989) or (2) ordinarily prohibiting psychological testimony as to causation, but permitting it when offered in combination with a physician's testimony, e.g., Simmons v. Mullen (1974).

In Haas v. Seekell (1989), a worker's compensation case, the court held that a psychologist was not qualified to testify as to a causal nexus between an injury sustained in the workplace and an organic personality syndrome. The court pointed out that, although the organic personality syndrome was predicated upon the existence of organic brain damage (an area within the expertise of the psychological expert witness), testimony as to the syndrome's cause would be outside the psychologist's area of expertise. Nonetheless, the court held the testimony to be harmless error under the facts of that case, on the grounds that "the logical sequence of events" itself established the natural and probable causal connection.

In Simmons v. Mullen (1974), a personal injury case involving a child who was struck by an automobile, the court held a clinical psychologist competent to testify as to neuropathological dysfunction following a concussion. The court reasoned that to accept the appellant's argument "that psychologists are not competent witnesses to testify on physical matters would be to ignore present medical and psychological practice." In addition, the court stated that the state legislature has acknowledged, as part of the Pennsylvania Mental Health Act of 1966, that "*certain brain abnormalities* [italics added]...require determination by psychological rather than medical examination."

In Richard Joint Venture v. Brunson (1994), the appellate court utilized an estoppel argument against the defendant who contended that the psychologist's testimony concerning the causal relationship between the injury and the plaintiff's dysfunction was inadmissible. Preceding the trial, the trial judge declined to qualify the psychologist as an expert witness as to the issue of causation. The judge ruled that the psychologist was to testify "strictly" within the area of

psychology. Nonetheless, the record indicated that the psychologist did indeed testify as to issues of causation. Notwithstanding this, the court rejected a finding of error in the psychologist's testimony due to the fact that the issue of causation arose out of the defendant's cross-examination of the psychologist and not from the plaintiff's direct examination of the witness.

Conclusion. In summation, neuropsychological evaluations and expert witness testimony are frequently used in civil cases to educate, and therefore, persuade judges and jurors of the veracity of a parties contention of existence/nonexistence of neurobehavioral dysfunction and in some cases its etiology. The general utility and reliability of expert neuropsychological analysis and testing in assessing brain functioning is acknowledged by the law and the medical profession alike. Many physicians frequently consult with neuropsychologists in cases of suspected brain injury. The reliance of the majority of the legal and medical systems on neuropsychology is due to its valid and reliable utilization of scientific methodology to study behavior and its underlying mental processes in the context of the neural and biochemical mechanisms entailed in those processes. Such utility opens a perfect niche for clinical neuropsychology to educate the fact-finders of our legal system. Although the majority of courts recognize the qualification of the neuropsychologist to competently testify as to both the neuropathological effects and etiology of brain injury, a small minority of courts continue to categorically disqualify neuropsychological experts from testifying regarding issues of causation. The minority decisions indicate misconceptions of neurodiagnostic practice as related to both brain injury and functional injury, in addition, to taking views divergent with both statutory rules and the substantial weight of pertinent precedence.

CHAPTER II

Basis for Neuropsychological Expert Witness Testimony as to the Element of Causation in Negligence Actions of Brain Damage Claims

The legal element of causation is generally defined as the active, efficient cause that sets in motion a chain of events that brings about a result without the intervention of any other independent source (Barron's Law Dictionary, 1996). In tort law, "one's liability is generally limited to results 'proximately caused' by his conduct or omission" (Barron's Law Dictionary, 1996). Legal proximate cause is "that which in natural and continuous sequence unbroken by any new independent cause produces an event, and without which the injury would not have occurred" (Barron's Law Dictionary, 1996). As previously discussed in Chapter I, courts have universally qualified the use of neuropsychologists to infer the existence of organic brain injury. Neuropsychologists may base these inferences on numerous factors including measures of neurobehavioral functioning, personality changes, medical reports, patient history, patterns of deficit, etc. These factors must not necessarily be based on the neuropsychologist's own observations or their own area of expertise, rather, they must only have a reasonable basis on which they may rely in forming their opinion (FRE 703). The existence of the brain injury itself, is not a matter of damages in and of itself, rather, it is the resultant functional deficits which are compensable. (Although other damages may be sought after in a brain injury case, it is the resulting functional damage which is of primary concern to the neuropsychological expert witness.) The existence of brain damage in and of itself becomes important only as evidence of a causal link between the functional deficits and the alleged incident. The position of the expert witness rendering an opinion as to the cause of that brain injury, is to base their opinion on scientifically grounded evidence that the alleged incident was or was not the cause of the brain damage itself. This chapter will review the value and limitations of neuropathological etiological determination of central nervous system pathology.

Probative Value and Limitations of Neuropsychological Expertise Regarding Causation in Negligence Actions:

The basis of neuropsychological causation testimony must be grounded on the neuropsychological determinative process. Each step of the process carries with it its own limitations. Before launching into an explanation of the difficulties faced by the neuropsychologist in the causative determination of injury, it is necessary to give a brief explanation as to this determinative process. Although the process is in actuality an integrated whole, for purposes of forensic decision-making it must be viewed as a multi-step method of analysis.

The first step in etiological determination of a brain injury must necessarily be a determination of the existence of any injury. (Unless the cause of brain damage continues to be evident in actuality, such as toxins currently within the brain, tumor, or current infection, the process of etiological determination must be made retrospectively.) In any brain injury, its existence must be determined by measuring changes in either the physical nature of the brain itself, or the behavioral manifestations of those physical changes over time. As physical changes to the brain are not determined by the neuropsychologist, rather by the physician (usually a neurologist in conjunction with a radiologist), such determination will not be discussed other than to say that it is used as a collateral source for neuropsychological causative determination. Therefore, to determine the existence of a brain injury, the neuropsychologist must first assess the patient's current level of functioning. Second, the neuropsychologist must create a best estimate of premorbid functioning. Third, premorbid and current functioning are then compared to determine the change in functioning. Lastly, etiological determination requires establishing a causal nexus which connects the changes in either the neurology of the brain or its behavioral manifestations to phenomena; this must be done while ruling out other possible causes of the differences between premorbid and current functioning.

Although legally improper, courts have used limitations in this process to disqualify neuropsychologists from testifying on the issue of neuropathologic causation. Much of the judicial opposition to neuropsychological expert testimony is due to arguments made by a number of critics refuting the validity and reliability of neuropsychology as a "science." These "method skeptics" have attempted to undermine the value of neuropsychology by attacking the underlying scientific methodology of neuropsychological research and the ecological validity of its application. The most outspoken and frequently cited of these critics are Ziskin and Faust (e.g., Ziskin and Faust, 1988; Faust & Ziskin, 1988, 1989). The most notable of these criticisms include: 1) contrasting goals, perspectives and roles between the practice of neuropsychology and the scientific expert witness; 2) paucity of research in neuropsychology as to neuropathological base rates; 3) a lack of standardized practices within the field of neuropsychology; 4) difficulty determining prior functional status; 5) a poor capacity to recognize malingering of neuropathological symptomology; 6) a poor capacity of neuropsychologists to integrate overly complex data in their decision making; 7) difficulty explaining away alternate cause or explanations for "abnormal" results; 8) a lack of standardized credentialing of neuropsychologists; 9) questionable practices; and 10) reliance on self-report. In essence, these criticisms are ones of the validity and reliability of neuropsychologists to diagnose functional impairment related to central nervous system dysfunction and relate such impairment to the determination of legal issues. The biased nature of the method skeptics criticisms were brought to light by Brodsky (1989) and Adams and Putnam (1994), asserting the unequal consideration of divergent findings in the neuropsychological literature. In his presidential speech to the American Psychological Association, Matarazzo (1990) felt it necessary to dispute some of the biased views, yet was also compelled to agree with some of the criticisms. Many of the criticisms levied against the utility of neuropsychology in the forensic arena have valid contentions. However, method skeptics have frequently overinflated the consequence of neuropsychological imperfection.

As in all fields of scientific endeavor, clinical neuropsychology does have a number of valid limitations to its helpfulness in the legal setting. The bulk of these limitations are related to the neuropsychological capacity to validly and reliably diagnose functional impairment related to central nervous system dysfunction. However, courts have consistently and universally deemed both psychologists and neuropsychologists qualified to testify regarding the existence of organic brain injury. Courts may have done so either by conflating the issues of expert qualification, scientific validity/reliability and reasonable basis or by properly applying the rules for qualification.

Courts that have conflated the issues of qualification, validity/reliability and reasonable basis may essentially be reasoning that although neuropsychological study is imperfect, "...its probative value is [not] substantially outweighed by the danger of unfair prejudice, confusion of the issues..." (FRE 403); and/or it "...will assist the trier of fact to understand the evidence or to determine a fact in issue..." (FRE 702); and/or the "...facts or data in the particular case upon which [the neuropsychological] expert base[d] an opinion or inference [are] of a type reasonably relied upon by experts in [neuropsychology] in forming opinions or inferences upon the subject" (FRE 703).

Other courts recognized that qualification of the neuropsychologist is not an issue of the validity/reliability of the underlying scientific process or reasonable basis, but rather, asked the proper legal question: If it is presumed that the neuropsychological process can validly and reliably measure, determine or predict a phenomena, 1) can this aide the trier of fact in determining a relevant issue and 2) is this specific neuropsychologist educated and experienced in the neuropsychological process.

Although, it is legally improper for a court to determine qualification of an expert based on issues of validity/reliability and/or reasonable basis, the frequency of this error requires a discussion of the perceived limitations of neuropsychological study. However, courts have consistently and universally deemed both psychologists and neuropsychologists qualified to testify regarding the existence of organic brain injury in light of limitations of neuropsychology in its existential determination of organic brain injury. It therefore, becomes unnecessary to consider such limitations as only indirectly related to questions of etiology. Rather, as the question posed is one of qualification of neuropsychological experts regarding issues of causation, only criticisms directly related to the determination of neuropathological etiology will be discussed.

Determining prior functional status. Regardless of the necessity of neuropsychologists to determine premorbid functioning, although numerous methods are commonly utilized (e.g., consideration of history), there is no universally accepted mode of performing this. The ideal situation would be to have comprehensive standardized neuropsychological and psychological batteries performed prior to the onset of the alleged neurological injury. However, this is rarely the case. Premorbid functional estimation is more frequently based on other less reliable data.

Premorbid estimation data may be categorized into three essential types: a) historical data, b) current level of functioning, and c) demographic data.

The determination of current level of functioning brings with it a number of possible confounds, once again, including the possibility of secondary-gain, conscious/unconscious malingering, etc. These problems become exponentially perplexing when applying data gleaned from current neuropsychological evaluation to the determination of pre-injury functioning.

Assessing premorbid functioning must take into account both neurobehavioral functioning and personality functioning. The following will be a brief description of the most common methods for accomplishing this and some of the possible limitations they present.

Methods for Assessing Premorbid Cognitive Functioning:

Actuarial methods. Frequently, methods for assessing premorbid cognitive functioning have utilized actuarial estimation of quantifiable functions. Generally, these methods tend to be more reliable than approaches that rely on more qualitative judgment of the existence and magnitude of cognitive dysfunction (Kareken, 1997). A number of such procedures have been generated that include demographically-based estimation of premorbid IQ, performance-based estimation and combined demographic/performance-based methods.

The most commonly utilized of these actuarial methods is the premorbid estimation of intellectual capacity based on demographic variables. Numerous studies have demonstrated a relationship between demographic variables and intellectual functioning (Vanderploeg, 2000). Two methods of utilizing this known relationship between demographics and intelligence are 1) the clinician-based demographic tabular approach in which a neuropsychologist may subjectively use demographically based IQ tables and 2) the regression formula-based demographic approach in which the neuropsychologist may “plug-in” variables to regression formulae developed out of clinical research.

Research studies evidence mixed results with these methods, with some showing substantial reliability, and other studies showing the possibility of significant error (Putnam, Ricker, Ross, & Kurtz, 1999; Faust, 1991).

“Hold” methods. “Hold” methods are grounded upon a comparison of current measures of certain cognitive abilities that are judged to be resilient to the effects of brain injury (e.g., the Vocabulary, Information, and Object Assembly subtests of the Wechsler intelligence scales) to those that are less resilient. If these “hold” measures are significantly higher than other cognitive measures, they may be used as “best estimates” of pre-injury functioning.

An example of a “hold” method commonly utilized in the premorbid estimation of cognitive abilities is the National Adult Reading Test (NART; Nelson, 1982). The NART relies on the finding that the current reading levels of brain-injured patients are significantly correlated with

premorbid intelligence (Crawford, Parker, Stewart, Besson, & DeLacey, 1989; Nelson, 1982). The NART takes advantage of the familiarity that brain injured patients may have with “irregular” words which do not conform to regular phonetic rules (e.g., phone or debt) (Vanderploeg, 2000). A number of studies have found NART performance to be comparatively resilient to the effects of brain injury (Vanderploeg, 2000).

However, some research on the “hold” approaches has shown these measures to be significantly lacking in reliability (Klesges & Troster, 1987). The main limitation of such “hold” methods is that brain injury can substantially affect all areas of cognitive functioning. However, recognizing which areas of the brain have been injured can increase the reliability of these measures, as such knowledge may aide the neuropsychologist in assessing the utility of a specific “hold” measure.

Clinical use of historical data. There is no contention regarding the utilization of the individual’s historical data, as temporal proximity to the actual functioning (in this case pre-injury functioning) increases the predictive quality of information. Historical review should include all available records (e.g., educational, employment, medical, military). Regrettably, there are no standardized procedures for accomplishing this. Individuals involved in litigation may be unreliable historians for a number of reasons such as poor memory due to brain injury, secondary-gain, conscious/unconscious malingering, etc. The use of additional sources of history, such as, friends, family, and employers is highly recommended. The particulars of such data can be critical in the differentiation of premorbid deficits from those caused by the alleged injury.

Educational records. The utilization of educational records including educational testing have proven useful in the assessment of both premorbid cognitive and personality functioning. There is substantial research to show that prior academic achievement correlates with present cognitive ability in the not brain-injured person (Ceci, 1991; Barona, Reynolds, & Chastain, 1984). In the United States, nationally standardized achievement testing is performed numerous times during an average scholastic career. The more component types of education tested for in achievement tests, the greater the neuropsychologists’ capacity to estimate the premorbid functional level of the patient. Strengths and weaknesses in educational achievement must be taken into account, as frequently, neuropsychological tests may be affected by academic skills. The Paced Auditory Serial Addition Test (PASAT), for example, which measures sustained attention, is highly correlated with mathematical ability (Sherman, Strauss, & Spellacy, 1997). Although, educational records may be helpful in determining prior functioning, their utility has proven to be somewhat misleading. For example, Keenan, Ricker, Lindamer, Jiron and Jacobson (1996) demonstrated that although there was strong correlation between the California Verbal Learning Test(CVLT) scores and the Wechsler Adult Intelligence Scale - Revised (WAIS-R) Vocabulary subtest (a variable that highly correlates with educational level), educational level was not significantly correlated with CVLT performance. A further limitation on the use of educational records are the varying levels of scholastic rigor across schools and school districts. In addition, an individual’s proficiency as a test taker can skew resulting achievement test scores. In older

patients, scholastic records may not even exist. Other questions may also arise concerning the validity and reliability of educational testing, such as: Did the individual give best effort in completing the testing? Did they cheat? Were they well rested? Were they ill? Ultimately, the utilization of academic performance as a benchmark for premorbid functioning introduces significant possibilities of error if the possibility of confounding variables is not considered; and is unreliable as a sole basis for the estimation of premorbid functioning.

Military Records. Military records may include evidence of prior functioning. Such records may include the Armed Services Vocational Aptitude Battery (ASVAB) (the military entrance exam), evidence of conduct problems, physical and mental health problems, and in some cases previous psychological/neuropsychological evaluations.

Employment records. Occupational accomplishment, like educational achievement, has a relatively high correlation with intelligence (Barona, et al., 1984) and becomes useful in the evaluation of premorbid functioning. However, the neuropsychologist must be vigilant to other possible mitigating factors such as the psychosocial environment as they can greatly influence career success. Employment records, like military records, may hold documentation of conduct problems, physical and mental health problems, drug abuse, and in some cases previous psychological/neuropsychological evaluations.

Medical records. Prior medical histories may evidence prior levels of functioning. Histories may include previous head injuries, cerebro-vascular accidents(CVAs), developmental disorders, alcohol and other substance abuse, etc.

Although the possible effect of a pre-injury medical history may be obvious, other issues may not be as evident. A number of premorbid medical issues can skew the results of medical tests. While many medical diagnostic tools are expected to have little possibility for error (e.g., blood levels, x-ray), other tests show far less diagnostic reliability. Some of these tests have been more frequently used in the forensic context. These include the use of single photon emission computed tomography (SPECT) and quantitative electroencephalogram (EEG) for the investigation of head/brain injury. Zhang, Park and Kim (1994) discuss the use of SPECT and its possibility for error in the diagnosis of cerebral injury. Recognition of the possible errors in medical diagnosis may be helpful in increasing the validity of neuropsychological determinations of premorbid functioning.

Other sources. Other sources that may be useful in the estimation of premorbid functioning should, when possible, include clinical interview of the individual, family, friends, coworkers, treating physicians, psychotherapists, etc. Each of these sources may contribute its own possibility for error variance for which the forensic neuropsychological practitioner must be watchful.

Best Performance Method. Similar to the “hold” methods is the “best performance method” proposed by Lezak (1995). This method suggests using the patients best level of cognitive

ability at any time in the past or present as the benchmark to be used against all other functioning. This method utilizes historical data (as discussed in the previous section “Clinical Use of Historical Data”) in conjunction with current and past performances to determine the individual’s best performance. This method will consistently result in a higher level of premorbid functioning than any other method. The main difficulties with using this method are 1) it may overestimate an individual’s preinjury capacity due to the normal variance that occurs within any individual’s performance or 2) the best performance may be an underestimate of premorbid functioning due to the possibility of a decrease in all areas of functioning post-injury. In either condition, it was reported that the “best performance method” tends to considerably overestimate cognitive functioning by 15 to 30 points (± 1 SD) for both normal and neurologically impaired individuals (Mortensen, Gade, & Reinish, 1991).

Personality assessment methods. The assessment of personality in estimating premorbid functioning is an obvious concern of the neuropsychologist attempting to approximate the pre-injury functioning of the forensically involved patient. Personality changes are frequently not only a matter of discomfort for the brain-injured patient, family and friends, and an issue of damages, but can be of utility in the determination of both premorbid cognitive and personality functioning.

It has long been recognized that personality variables may influence the subsequent manifestation of physical and behavioral symptomology of an illness. Undeniably, lifelong personality traits may act as the figurative lens through which an individual’s reaction to any injury, including the neuropathological, may be viewed and understood. Personality issues may be exacerbated by the alleged injuries and therefore be contributing factors in the individual’s current level of functioning, or in the alternate, injuries may be exacerbated by premorbid personality traits (Lezak, 1995) (this will be further discussed later under Alternate Causes).

As is well known within the clinical arena, personality variables may also greatly contribute to the expression of cognitive capacity. For example, conduct problems or resistance may be manifested in decreased intellectual testing results (Lezak, 1995). It is customary practice within the clinical psychological arena to always view the results of any evaluation of functioning with consideration of the confounding possibilities of personality variables. The perplexing nature of human behavior becomes exponentially more so with the consideration of personality directing some within the forensic arena to question the reliability of clinical results based on such variables. This has led investigators in the clinical forensic arena to rely on more quantitative measures of the effects of personality constructs on functional capacity. The results of these studies have implicated the role of personality features in the evaluation of cognitive abilities in the normal population; however, it is unclear if these results are generalizable to the brain-injured population (Ackerman and Heggestad, 1997; Wrobel and Wrobel, 1996).

The principle of convergence in the determination of premorbid functioning. Central to the utility and practice of psychological and neuropsychological assessment is the principal of convergence. In essence, this principle holds that as the number and reliability of multiple

measures that indicate the existence of a phenomena increase, so increases the reliability and therefore probability of the existence of that phenomena. It is therefore standard and expected practice for the neuropsychologist to utilize and integrate all data in estimating premorbid functioning.

Conclusion. A number of methods have been developed to estimate the premorbid functioning of the brain damaged individual. Each of these methods has significant shortcomings in terms of their reliability. In the forensic arena reliability of premorbid functional estimations is of central concern. To judges who must make determinations of admissibility and to the trier of fact who must make judgments of credibility regarding such evidence, the reliability of these methods will almost invariably become an issue of significant consideration.

Critics of the use of neuropsychology in the courtroom have focused on the reliability of these methods to argue against their utility in the legal setting. Some courts have used these criticisms to disqualify the utilization of neuropsychologists to testify regarding the issue of neuropathological causation. Although, there is evidence to show limitations of reliability with each of these methods, courts that have employed these limitations as justification for disqualification may have done so in error. First, unless these courts have considered the convergent reliability of multiple methods utilized as the basis for the determination of prior functioning, then their decisions are erroneously based on incorrect assumptions underlying the dependability of these methods. Second, and most importantly, the qualification of neuropsychologists is not legally dependent on the validity or reliability of their methods, rather as previously discussed in Chapter I, qualification is based on 1) the helpfulness of neuropsychology to educate the trier of fact as to the relevant issue and 2) the education and experience of the individual neuropsychologist.

In addition to the limitations of neuropsychology to determine premorbid functioning, although a comparable problem exists in medicine, commentators have criticized its utilization in the courts due to the possibility that neuropsychology may be unable to rule out alternate causes for neuropathological injuries.

Ruling out alternate causes:

Certainly, isolating the principal cause of existing symptomology and cognitive change is of special interest to attorneys responsible for arguing issues of liability, as causation is one of the necessary elements to be proven in negligence actions. Although an expert opinion regarding the determination of legal proximate cause may be offered where there is only covariation between the alleged type of deficit and the alleged type of incident (e.g., memory loss from anoxia); as causation may be, and frequently is, a matter of multiple factors, the determination of these factors and the amount to which they contribute to an injury is of utmost importance in a negligence case. This is underscored, in a minority of jurisdictions, by the common law rule of contributory negligence, which denies recovery by a plaintiff if his actions contributed to the harm incurred. The position of the neuropsychologist as an expert witness regarding issues of

causation therefore requires a capacity to distinguish all possible etiologies of personality and functional change from premorbid levels. In addition, the neuropsychologist must be capable of estimating the probability of the existence of any of these possible etiologies.

There are numerous possible causes for the symptoms of brain damage. The position of any plaintiff in a negligence action for brain damage is that the alleged negligent action was the actual and proximate cause of the difference between premorbid and current functioning. A defendant's claim may take the form of two different arguments. More than one argument may appear in any particular case. First, it may be contended that the plaintiff's condition preexisted the incident at suit. Second, the defendant may agree that the plaintiff's functional level is decreased since the pre-incident condition, but claim that deficits were caused by some means other than the alleged incident. The position of the neuropsychologist as an expert witness regarding issues of causation therefore requires a capacity to distinguish all possible etiologies of personality and functional change from premorbid levels. In addition, the neuropsychologist must be capable of estimating the probability of the existence, or lack thereof, of any of these possible etiologies.

The neuropsychologist's capacity for differential diagnosis. The neuropsychologist's role, both in and out of the forensic sphere, requires competence in the causative determination of functional deficits and personality change. In clinical practice, neuropsychologists are responsible for the well-being of their patients in their diagnosis and treatment of neuropathology. The determination of causative factors is of the highest concern, as it may play a significant role in treatment planning. Therefore, training in differential diagnosis is central to the education and experience of any neuropsychologist. In the forensic arena, the neuropsychologist may apply his skills in differential diagnosis to determine and rule out any reasonable explanations for neurobehavioral functioning, therefore, aiding the trier of fact in making informed decisions related to causation.

In discussing the neuropsychologist's capacity to determine and rule out possible etiologies for brain injury, it first becomes important to recognize the difference between actual physical causes of brain injury and the behavioral manifestations of brain injury. Brain injury is an actual physical change to the brain. These changes may include gross structural changes in the neuroanatomy of the brain itself, structural changes of nerve tracts, structural changes to the cytoskeletal structure of the individual neuron, and intracellular molecular changes. Behavioral changes are the manifestations of brain injury. These behavioral changes may take the form of neuromotoric, neurocognitive and personality changes. Although not the only basis for neuropsychological etiological determination of brain injury, characteristics (i.e., pattern, type, severity, timeline of recovery, etc.) of these functional deficits are a major source of evidence used to infer causation. The difficulty with inferring behavioral causation from its effects, is that these effects may be the result of numerous etiologies outside of brain injury itself. There are a number of possible etiologies to functional and personality changes over time. Possible etiologies of behavioral change may be classified into two groups 1) true physical injury or 2) psychological causes diagnoses. As the distinction between the two is artificial (the physical and behavioral aspects of an individual are inextricably intertwined), this distinction is made only to best explain the differences in neuropsychological consideration of causation.

Physical causes of behavioral deficits. Physical causes of changes in behavioral functioning may include: 1) Neurological disorders, such as epilepsy, Parkinson's disease, or stroke; 2) Infections, such as brain abscess, Central Nervous System (CNS) syphilis, meningoencephalitis, pneumonia, or septicemia; 3) Degenerative and "slow viral" diseases, such as Alzheimer's disease, Pick's disease, or Huntington's disease; 4) Endocrine dysfunction, such as thyroid or parathyroid disorders, adrenal disorders such as Addison's disease, or hypoglycemia; 5) Primary posttraumatic neurologic reactions, such as subdural hematoma, normotensive hydrocephalus, or contusion; 6) Vascular disorders, such as hypertension, cerebral embolism and thrombosis, cerebral atherosclerosis, or congestive heart failure; 7) Metabolic and electrolytic abnormalities, such as liver, kidney, or lung disease, SIADA acidosis or alkalosis, Wilson's disease, or porphyria; 8) Nutritional and deficiency states, such as vitamin or iron deficiency or pernicious anemia; 9) Drugs and medications, such as alcohol, sedatives, anticholinergic drugs, steroids, amphetamines, or antihypertensive drugs; 10) Toxic conditions, such as lead, mercury, or arsenic, solvents, or organophosphates; 11) Neoplastic disorders, such as primary brain tumor or metastatic cancer; 12) Other medical conditions, such as intractable seizures, status petit mal, or remote effects of carcinoma and, 13) head injury (Von Talge, J., 1995).

Physical causes of neuropathology underlying functional deficits must be viewed as on a continuum when discussing the neuropsychologists capacity to diagnose and rule out alternative causes. Such a continuum must be viewed as between the two theoretical extremes of physical causes that are only inferable from measures and tests of a tangible nature from those that are only inferable by measures of behavioral functioning. Neither of these extremes is evident in reality, as all causes of brain injury result in some physical and neurobehavioral sequelae, although not necessarily significant nor measurable with current technologies. However, this is not to say that all possible causes are equally determinable by either medical or neuropsychological science. Rather, both medicine and neuropsychology may provide their own relevant understanding to causative determination, with some etiologies being more validly and reliably determinable by one or the other science.

There is no definitive demarcation between the purview of medical and neuropsychological etiological diagnosis of neuropathology. Essentially, however, the difference lies in the nature of the tools employed in diagnosis. Medical diagnosis typically relies on tests of a more physical domain, while neuropsychology relies on behavioral tests. There is significant overlap in the procedures utilized in both fields. Diagnoses which are less conducive to physical diagnostics of etiology and more amenable to behavioral diagnostics will inherently be more favorable to neuropsychological investigation; and in the reverse. Physicians, especially neurologists, frequently utilize medical tests (e.g., CAT, MRI, blood pathology reports), in addition to other tests of a more behavioral nature (e.g., tests of motor functioning, sensation, perception, and cognition) to determine neuropathological causation. Furthermore, physicians frequently rely on neuropsychological assessment for such determination. Neuropsychological diagnosis typically depends on behavioral measures such as tests of motor functioning, sensation, perception, and

cognition to determine neuropathological causation. However, neuropsychologists must also rely on the results of medical tests, as reported by physicians, to bolster their understanding of the underlying neuropathology. For example, brain imaging findings may be used for the localization of brain damage. In addition, physician consultations may be used to rule out the possibility of other medical diagnoses which may have led to the neurobehavioral deficits observed. There is a significant crossover of medical and neuropsychological understanding of etiological determination in the diagnosis of brain injury.

Neuropsychology has a distinct value both in reinforcing medical diagnosis of neuropathological etiology and outside of what may be established by medical technology. By utilizing patterns of neurobehavioral functioning the neuropsychologist may be able to determine the underlying physical injury (Feinberg & Farah, 1997). Feinberg & Farah (1997) provide an in depth explanation of neuropsychological patterns associated with specific disorders and neuropsychological assessment of these disorders. For example in closed head injuries, certain areas of the brain are particularly vulnerable to damage regardless of the site of impact, and characteristic patterns of deficits can be expected (Lezak, 1995). Although the capacity of brain imaging technology to measure and explain brain injury is constantly improving, brain damage at the cellular and intracellular level is currently outside of its reach (Silver, & McAllister, 1997). When this is the case neurobehavioral functioning may be the only evidence of any injury. It is at this point that the neuropsychologist's expertise becomes most relevant.

Neuropsychological etiological determinations must be made based on numerous factors including pattern analysis of functional deficits in the context of the patient's history, patterns of recovery, consideration of psychological factors, timelines of the alleged incident and cognitive changes, and analysis of the incident itself (e.g., analysis of the neurophysics of a MVA), while utilizing the expertise of the medical community to confirm and rule out other possible causes which may be less amenable to behavioral diagnostics. These factors must not necessarily be based on the neuropsychologist's own observations or their own area of expertise, rather, they must only have a reasonable basis on which they may rely in forming their opinion (FRE 703). It is the aggregate of cross-disciplinary etiological determination which is necessary as a basis for valid and reliable scientific opinions. It is this cross-disciplinary explanation of brain injury and its etiology which has become increasingly utilized in the litigation of brain injury claims (Bigler, 1987).

If the limitation of neuropsychology to fully explain and rule out all possible etiologies of brain injury has been used to justify disqualification of neuropsychologists, it has been done in error. First, as has been already discussed, the etiological explanation of brain injury is by its nature determinable by inference from both physical and behavioral measures. Although neuropsychologists may not order or interpret the results of medical diagnostics, they do and may utilize the results of these tests as reported by physicians as the basis for confirming and/or ruling out alternate causes for brain injury. No science, including medical science, can fully explain and

rule out all possible etiologies of brain damage, nor is it required in court that an expert witness be able to do so. Rather, the task of the expert witness, as engendered in the rules, is to aid the finder of fact in better understanding the issues involved to make a more informed decision. If the expert witness can do this from any perspective, and has the education and experience to do so, then that expert may be qualified to do so. Secondly, as previously discussed, considerations of the reliability of the methods utilized to determine causation of injury are misplaced as the qualification of neuropsychologists to testify regarding cause is not legally dependent on the validity or reliability of their methods. Rather, these considerations may only take place after the qualification of the individual neuropsychologist.

Psychological causes of behavioral changes. Functional changes may have infinite possible causes. Although, these other causes have been referred to as being outside the realm of brain injury, this definition is somewhat inaccurate. One's psychology, and therefore, explanation of an individual's behavior, is inexorably linked to one's physical being. As nearly all behavioral changes are due to some changes within the brain (some behavioral changes may be due to changes within the peripheral nervous system), the reference to specific types of changes or abnormalities within the brain as "brain injury" is somewhat arbitrary. Therefore, when discussing psychological causation in the context of alternate causation, we must view causes outside of "brain injury" to have no absolute meaning, but rather, from the legal point of view, as a reference to etiology outside of the plaintiff's alleged injury as a direct result of force or exposure to toxic chemicals or pathogens due to an action by the defendant and other causes less amenable to direct physical determination. Such a definition is necessary as injuries may occur which could lead to physical changes in the brain yet not be a direct result of force or exposure to toxic chemicals or pathogens, yet still be due to actions on the part of the defendant. Examples of such may be the causation of post traumatic stress disorder, adjustment disorder, or other psychological disorders which the law may not consider as "physical damages", but rather as "emotional distress." Such damages are considered separately by the court and governed by the rules related to "emotional distress", and will therefore, not be considered in a discussion of brain injury claims.

Although these psychological phenomena are being discussed within the framework of an explanation for alternate causation, they are in actuality not "causes" in either the legal or psychological sense. From the legal point of view, alternate causation would refer only to causation other than that of the alleged action of the defendant which led to a change in the plaintiff's brain as a direct result of force or exposure to toxic chemicals or pathogens manifested in functional changes. In essence, "psychological causes" of behavioral dysfunction are not other possible causes for a brain injury, rather they are other possible causes for the behavioral changes observed. Since it is these behavioral changes from which the psychologist/neuropsychologist must, in large part, infer both the existence and etiology of brain injury, it is vital that other non-injury causes for dysfunction be considered or ruled out. With this understanding in mind, psychological causation may include any reason for behavioral dysfunction outside of those already discussed. From a more tangible perspective, psychological/neuropsychological causes of behavioral changes that are frequently utilized to refute the existence of a brain injury include: 1) current or recent life factors others than the traumatic incident; 2) delirium, 3) dementia, 4)

amnesic disorders or any other cognitive disorder, 5) dissociative disorders, 6) mood disorders, 7) anxiety disorders, 8) schizophrenia or other psychotic disorders, etc. Other behavioral and personality changes may also be a matter of conscious or unconscious motives endemic to forensic involvement. These motivational causes of behavioral change include the possibility for secondary gain and/or malingering (Rogers, 1997).

Essentially, the determination of “psychological” causes to behavioral dysfunction is not part of the etiological explanation of a brain injury. Instead, it is a determination of the existence of some other reason for observed deficits in behavioral functioning, which may or may not be related to a brain injury (i.e., exacerbation of prior psychopathology; creation of stress related psychopathologies, such as adjustment disorder and depression). Such psychological dysfunction may be viewed along a continuum from more biologically based clinical psychopathologies to those that are more behaviorally based. The capacity for neuropsychology or psychology to validly and reliably determine the existence of psychopathology is generally well accepted by the courts (Foster, 1999), and is far from relevant to the rules governing determination of a neuropsychologist’s or psychologist’s qualification to testify regarding the issue of brain injury causation. However, the capacity for neuropsychologists/psychologists to reliably rule out more motivational explanations of a plaintiff’s functioning has frequently been put to question (Sweet, 1999).

Secondary gain and malingering of neuropathological symptomology. Behavioral and personality changes may also be a matter of conscious or unconscious motives endemic to forensic involvement. These motivational causes of behavioral change include the possibilities for secondary gain and/or malingering.

Secondary gain in the forensic arena may be described as the unconscious seeking of psychological benefits attendant to involvement in the legal process (e.g., attention, denial of personal responsibility) (Rogers, 1997). Secondary gain may be a product of a belief in the prospect of monetary payments together with issues of self-sufficiency; when this is the case, secondary gain may be referred to as a “compensation neurosis” (Rogers, 1997). In brain injury cases secondary gain may pose somewhat of a “chicken or the egg” problem with the possibility of observable behavioral deficits being both a cause and/or an effect.

Malingering has as its essential feature “...the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives...” (DSM-IV, 1994). The financial incentives of brain injury litigation may certainly create the possibility of malingering. Several studies have confirmed that some individuals with external motivation will produce substantially deficient results on neuropsychological measures (Frederick & Crosby, 2000). It is therefore incumbent that the neuropsychological expert witness be prepared to consider malingering as a possible reason for a plaintiff’s observable deficits.

The reliability of the psychologist/neuropsychologist to detect the presence of secondary gain or malingering has been central to the criticisms of method skeptics. Criticisms have primarily

been based on the findings of studies 1) which evidence poor reliability of individual neuropsychological tests and batteries, or 2) reflect poor reliability of mental health professionals to detect malingering. In reality however, the results of these types of studies has been somewhat mixed (Etcoff & Kampfer, 1996). Much of the results of studies of malingering must however, be critically viewed, as these studies are frequently hampered by a number of methodological problems, including issues of variation in nonclinical samples, and the selection of research subjects (Pankratz & Binder, 1997).

Initially, research studies attempted to identify malingerers based on the results of standard neuropsychological tests and batteries. Given only raw data, neuropsychologists were rarely able to identify malingerers. For example, in one well-known study, correct prediction of malingerers ranged from chance to 20% above chance (Heaton, Smith, Lehman, & Vogt, 1978). More recently, however, when neuropsychologists were cautioned as to the possibility of malingering, their judgments were exceedingly accurate in distinguishing brain damaged patients from malingerers (Trueblood and Binder, 1997). A number of specific neuropsychological tests have been found to be significantly more reliable than the general neuropsychological tests originally studied, and a number of more reliable contemporary tests have been developed specifically for the detection of malingering (Guilmette, Hart, Giuliano, & Leninger, 1994). Although, reliability of individual malingering detection tests has substantially increased over the years, these rates continue to be somewhat questionable (Rogers, 1997). However, reliability significantly increases when numerous factors are utilized in the detection of malingering. The best approach has been to incorporate several of the more recent tests with an analysis of the patient's pattern of performance across different tests that convergently assess the same neuropsychological functions in different ways (Rogers, 1997).

The courts must be especially careful in their consideration of the validity and reliability of neuropsychologists to detect brain injury, as the likelihood and effect of malingering decreases as the severity of a brain injury increases (Pankratz & Binder, 1997). Additionally, as severity decreases, other factors evidencing brain injury that may be useful in etiological determination (e.g., brain imaging, expected localization of functioning) become less apparent. Therefore, court concerns of validity and reliability regarding malingerers must naturally be more focused on the admissibility of neuropsychological testimony regarding those plaintiff's which evidence more mild forms of brain injury. Once again, concerns regarding the neuropsychologist's ability to detect malingering are misplaced in a consideration of the neuropsychologist's qualification to testify as to causation. This is so for at least two reasons. First, plaintiff's possible malingering may be considered an issue of whether or not a brain injury is or is not existent, and as already stated, psychologists and neuropsychologists have been universally qualified to testify as to the existence of organic brain injury. Alternatively, as previously mentioned, questions of reliability and validity are irrelevant to the determination of neuropsychological expert witness qualification. Rather, these are concerns to be addressed after the qualification of the expert witness based on the rules regarding qualification.

Conclusion.

Much of the judicial opposition to neuropsychological expert testimony is due to arguments made by a number of critics refuting the validity and reliability of neuropsychology as a “science.” Many of the criticisms levied against the utility of neuropsychology in the forensic arena have valid contentions. However, method skeptics have frequently overinflated the consequence of neuropsychological imperfection.

As stated by Taylor (1999):

“[There are] two primary groups of change agents. One group of ideologues seeks to change the world so that it comports to their personal sense of what is right; the other group strives to help people cooperate with one another....Certain members of the first group urge courts to refuse to admit neuropsychological evidence, arguing that clinical psychology is merely “junk science.”

There is substantial validity to some of the criticism’s of neuropsychology, and as such, they should be carefully considered and solutions urged. Although legally improper, some courts may consider limitations in the processes of etiological determination of brain damage to disqualify neuropsychologists from testifying on the issue of neuropathologic causation. In the aggregate, the criticisms forensic neuropsychology faces as a science in the courtroom are ones of validity and reliability. Such issues are not unique to forensic neuropsychology, but are significant issues inherent in any field of scientific endeavor. The law requires that for a science to be admissible to educate the fact finder, it must utilize the scientific method in a valid and reliable way. A substantial body of research indicates the validity and reliability of neuropsychological assessment and decision making. This is not to say, that the opinion of the neuropsychologist, or for that matter any expert witness, should be taken as *carte blanche* valid and thereby penultimate to the determination of the ultimate issue at bar. Rather than to deny neuropsychology’s admissibility in the whole, as in all sciences, judgments of admissibility should lie along a continuum as do actual reliability and validity; well established knowledge should be admitted and novel, less established, valid and reliable knowledge more closely scrutinized as to its decision making value. Neuropsychology should be judged according to the same standard as all sciences.

Although the validity and reliability of the specific determinative tests and procedures may be put to the question of admissibility, this however, is not a question of qualification of the individual neuropsychologist. Qualification is rather based on 1) the helpfulness of neuropsychology to educate the trier of fact as to the relevant issue and 2) the education and experience of the individual neuropsychologist. It is of considerable importance, however, to remember that the test for qualification is relatively liberal. This is in harmony with the progressively more liberal approach of the Federal Rules of Evidence to the admissibility of all evidence. It must not be overlooked, however, that there are checks and balances built in as protection to complement this liberal rule, namely, the weight to be given to the evidence. Although qualification and admission of expert opinion may allow the fact-finder the opportunity to consider the evidence, it surely does not compel credibility.

CHAPTER III

Rationale for the Utilization of the FRE for the Qualification of Neuropsychologists as Expert Witnesses Regarding Causation of Brain Injury

All federal courts, and the great majority of state courts, are required to apply the FRE (or its state equivalent) and the *Daubert* standard to the qualification and admissibility of scientific expert witness testimony. FRE 702 essentially requires that a court may allow an expert witness to testify if the testimony will be relevant to the facts at issue, the expert's testimony will be helpful to the trier of fact in its determinations, and the expert be qualified by experience or education in a particular area that distinguishes him/her from an ordinary person. Linked to the FRE 702's requirements of helpfulness and expert qualification is *Daubert's* requirement that courts must inquire into the "scientific validity" and "scientific reliability," of a test or principle when the results of a novel or controversial scientific test or principle are sought to be introduced by the proponent. Finally, FRE 703 requires that the expert witness must have a reasonable basis for his opinion. Essentially, these rules require a two-step process. First, the expert witness must be qualified as having the education and/or experience and helpful to the trier of fact in the determination of an issue. Second, the underlying basis for the scientific expert's testimony must be scientifically valid and reliable.

Since 1980, courts have universally found that neuropsychologists (and psychologists) are qualified as experts for purposes of testifying about the existence of organic brain conditions or injuries (Richardson, & Adams, 1992). The majority of jurisdictions permit neuropsychological testimony as to the causal relationship between neuropathological deficits and physical injuries. A small minority of courts, especially those at the trial level, have expressly disqualified psychological or neuropsychological expert witnesses offered to testify regarding neuropathological causation. Between the two more extreme positions, a minority of courts have cultivated more intermediate approaches to deciding the issue of neuro/psychological qualification to testify as to neuropathological causation, as discussed in Chapter I.

Although the rules specifically legislated for the purpose of determining the qualification of expert witnesses have most often been applied in the determination of neuropsychologists qualification regarding causation of neuropathological injury, as previously discussed, these rules have been improperly applied at times. There are numerous arguments pointing to the use of the FRE (and its state equivalents) as the proper rule in qualification.

To determine qualification under the FRE, it is necessary for judges to have a grasp of both the experiences which make an individual practitioner of neuropsychology an expert in the field and the scope of such practice.

The Appropriateness of Qualification Standards:

The rationale underlying the FRE rules (and its state equivalents) for expert witness qualification is that all evidence that may help the fact-finder determine the existence, or lack thereof, of a fact should be presented unless it would either be cumulative or prejudicial (FRE 401, 402 and 403). The liberal undertone of these rules is based on the assumption that as a finder of law, the judge's duty is to determine admissibility based on relevance, validity, reliability and expertise of the expert; while the determination of an expert's credibility is solely within the responsibility of the finder of fact. Although the FRE has been most frequently utilized in the determination of neuropsychological qualification regarding the issue of causation, as previously discussed, a small minority of states have not adopted the FRE, and other times, trial courts may have improperly applied the FRE. Some of the more frequent errors in expert witness qualification or disqualification have included: 1) Conflation of validity and reliability standards (i.e., Daubert) with the tests for qualification; 2) Reasoning that since physicians, especially neurologists, use neuropsychological data as the basis for their expert witness testimony regarding neuropathological causation, then neuropsychologists should be qualified to do the same (Valiulis v. Scheffels, 1989); 3) Reasoning that Ph.D/Psy.D's are not M.D.'s and are therefore not qualified to testify regarding "medical causation" (Chandler Exterminators, Inc. v. Morris (1992); and 4) Utilization of the argument that since the nature of neuropsychological research lends itself to the nomothetic description and prediction of phenomena, it lacks utility for the ideographic determination of issues within specific legal cases.

This is not to say that neuropsychologists should be qualified in every circumstance to testify regarding either the existence of a brain injury or its causation. Rather, a neuropsychologist's qualification to testify regarding neuropathological causation, or any other issue, may not be a definitive rule to be applied regardless of circumstance or individual competence.

Rather than applying improper rules and reasoning to the qualification of neuropsychologists regarding causation testimony, FRE 702 guides the judge in the proper analysis. Proper qualification requires an educated understanding of the current breadth of scientific knowledge within and shared by scientific fields of endeavor, as well as, an appreciation of the types of skill, experience, education, training and knowledge available in any particular science.

Conflation of validity and reliability standards with tests of qualification. Courts have conflated the issues of qualification, validity/reliability and reasonable basis to both qualify and disqualify neuropsychological testimony regarding neuropathological causation. Some courts have disqualified neuropsychologists based on a consideration of the validity and reliability of the underlying processes utilized in the determination of brain injury causation. Other courts which have qualified neuropsychologists may be essentially reasoning that although neuropsychological study is imperfect, "...its probative value is [not] substantially outweighed by the danger of unfair prejudice, confusion of the issues..." (FRE 403); and/or it "...will assist the trier of fact to understand the evidence or to determine a fact in issue..." (FRE 702); and/or the "...facts or data in the particular case upon which [the neuropsychological] expert base[d] an

opinion or inference [are] of a type reasonably relied upon by experts in the [neuropsychology] in forming opinions or inferences upon the subject” (FRE 703). Qualification of the neuropsychologist is not an issue of the validity/reliability of the underlying scientific process or reasonable basis. Rather, the proper legal question is: If it is presumed that the neuropsychological evaluative process can be validly and reliably measured, determined or predicted a phenomena, 1) is the trier of fact aided in determining a relevant issue and 2) is this specific neuropsychologist educated and experienced in the neuropsychological process. FRE 702 essentially requires that a court may allow an expert witness to testify if the testimony will be relevant to the facts at issue, the expert’s testimony will be helpful to the trier of fact in its determinations, and the expert be qualified by experience or education in a particular area that distinguishes him/her from an ordinary person. Linked to, yet separate from, the FRE 702’s requirements of helpfulness and expert qualification is Daubert’s requirement that courts must inquire into the “scientific validity” and “scientific reliability,” of a test or principle when the results of a novel or controversial scientific test or principle are sought to be introduced by the proponent. Essentially, FRE 702 requires a two-step process. Initially, the expert witness must be qualified by having the education and/or experience to be helpful to the trier of fact in the determination of an issue. It is only after the expert has been qualified may the underlying basis for the scientific expert’s testimony then be considered for its scientific validity and reliability.

Physicians use of neuropsychological data as justification of neuropsychologist qualification. Some courts have justified qualification of neuropsychologists to testify regarding causation based on the fact that physicians, especially neurologists, rely on neuropsychological assessment as part of the basis for their own expert witness testimony regarding brain injury causation. This approach is frequently rooted in the idea that "it would be somewhat anomalous to conclude [a psychologist] would not be qualified to testify about [the cause of plaintiff’s injury] when the neurologist who sought his expertise and assistance in diagnosing the disease would most likely be qualified to do so." Valiulis v. Scheffels, (1989).

Although such utilization by physicians may be useful as evidence of scope of competence for qualification purposes, it is not in itself a proper test. The major argument against this point of view is that, although under FRE 703 an expert witness may base testimony on any fact or data if it is of a type reasonably relied upon by experts in the particular field, the testimony of physicians may add something necessary to the determination of causation which neuropsychological assessment may not be capable. This argument may, depending on the facts of the case, be somewhat rhetorical as both the testimony of physicians and neuropsychologists rely on the scientific understanding of each other to base their determinations of neuropathological causation.

Who is the “Real Doctor?”:

Courts have extensively held that non-physician scientists may be qualified to testify on matters of causation when their education and experience can support their opinion. In Landrigan v. Celotex Corp. (1992), the New Jersey Supreme Court held that although an epidemiologist was

not a medical doctor and had never treated patients, this did not preclude qualification from testifying as an expert that asbestos caused colon cancer in the plaintiff. In Owens v. Concrete Pipe & Products Co. (1989), experts who held doctorates in chemistry were not disqualified from offering expert testimony in negligence and strict liability action on medical effects of toxic chemicals simply because they were not medical doctors. Other cases which have held that non-physician scientists may be qualified to testify on matters of causation when their education and experience can support their opinion include Hake v. Manchester Township (1985) and Rosenberg v. Cahill,(1985). As discussed in Chapter I, the majority of courts have held both psychologists and neuropsychologists qualified to testify to the causation of organic brain injury; an area frequently described as “medical causation”. However, there exists a minority of courts (as discussed in Chapter I) and jurisprudential commentators, as well as a common view by the general population (Shuman, Champagne, Whitaker, 1996), that doctoral level psychologists are not M.D’s , and therefore, not “real doctors.” From this perspective follows the belief that clinical psychologists/neuropsychologists are either not as competent as physicians or not competent at all to testify as to brain-behavior relationships. As previously discussed, a minority of courts have therefore looked to licensure/certification statutes to justify the disqualification of psychologists and neuropsychologists to offer an opinion on the issue of causation. These courts reason that neuropathological etiology is a matter of “medical causation,” and therefore outside of the statutory competence of the psychologist/neuropsychologist.

Such reasoning is frequently in contradiction of the legislative purpose of licensure/certification laws. These statutes are, in the greater part, created to define the boundaries of psychological/neuropsychological practice as related to their scope of scientific understanding and individual practitioner competency (APA, 1987). No licensure or certification statute specifically and explicitly limits psychological/neuropsychological expert witness testimony regarding any issue. Courts that intend to consider statutory limitation of practice as a test for expert witness qualification would be advised to consider that the legislative intent of such statutes may very well be equivalent to the test of its qualification rule corresponding to FRE 702, namely, a consideration of individual practitioner competency and the purview of psychological/neuropsychological understanding.

The perception of a minority of courts that all psychologists are unqualified to testify about medical causation due to their lacking a medical degree is simply unfounded. As explained by a leading scholar on evidence:

“The common law . . . does not require that the expert witness on a medical subject shall be a person duly licensed to practice medicine. (S)uch a rule is ill-advised, first, because the line between chemistry, biology, and medicine is too indefinite to admit of a practicable separation of topics and witnesses; and, second, because some of the most capable investigators have probably not needed or cared to obtain a license to practice medicine. 2 John Henry Wigmore, Evidence in Trials at Common Law § 569 (Chadbourn rev. 1979).”

Jurisdictions which have implemented a rule of disqualifying psychologists or neuropsychologists from testifying regarding “medical issues” have laid down a precarious precedent. Fundamentally, these courts are assuming that physicians are always the most competent to testify regarding neuropathological causation and then applying a "best evidence rule" to expert witness testimony. These courts are insinuating that only those most qualified may testify. In other words, if the subject-matter of testimony is regarding a “medical issue”, then only physicians may be qualified to offer an expert opinion. However, the only "best evidence rule" adhered to in American jurisprudence is one that pertains to the admissibility of written documents. However, for those jurisdictions that choose to apply such a “best evidence rule” to expert witness testimony, there are a number of situations (to be discussed later) in which neuropsychologists/psychologists may be considered to be the “best” expert witnesses.

Although the validity of the distinction between the M.D. and Ph.D./Psy.D. may be lacking for purposes of qualification of the expert witness testimony from both a legal and substantive perspective, many attorneys will make an effort to discredit the value of clinical psychologists and neuropsychologists in the legal arena. As these tactics may have an adverse effect on both the parties involved and the court’s perception of neuropsychological expert testimony, it is incumbent upon both the proponent attorney of such expert testimony and the neuropsychologist to be prepared to combat such tactics.

Utilization of nomothetic neuropsychological knowledge on legal issues. Some jurisprudential commentators have argued that since the nature of neuropsychological research lends itself to the nomothetic description and prediction of phenomena, it lacks utility for the ideographic determination of issues within a specific legal case. The argument follows, that epistemological differences between the dimensional thinking of the neuropsychologist as a scientist-practitioner and the dichotomous thinking inherent in the framework of legal decision-making makes the utilization of neuropsychological expert testimony invalid. In other words, since neuropsychological research can only make probabilistic statements within certain limits of confidence regarding the existence and prediction of phenomena, neuropsychological testimony lacks utility in helping a judge or jury make dichotomous (“yes/no”) determinations of the existence or lack thereof of a fact (Faust, Ziskin & Hiers, 1991; Cooke, 1990).

The validity of such an argument to discount the value of neuropsychology goes against the grain of logic. Neuropsychology relies on scientific methodology to describe and predict phenomena inherent in the brain-behavior relationship. The practice of clinical neuropsychology bases ideographic (case-specific) determinations on both nomothetic research as well as clinical experience. As in all practical sciences in which the prediction of a phenomenological occurrence is a goal, it is at the nexus of knowledge and experience where a science becomes an art. It is anomalous to argue that the decision-making process of the clinical neuropsychologist, or for that matter any expert witness, is no more than “invalid conjecture” based on probabilistic determination while arguing that the process of judicial determination by laymen is not. Such an argument could only lead to the disqualification of all experts incapable of making absolute determinations of fact (in itself a theoretical possibility only), and thereby rendering the

underlying assumptions of the use of any expert witness, as an educator of probabilities in the fact finding process, a nullity. Our jurisprudential system implicitly recognizes such in its principle of standards of proof, which requires the fact-finder to make determinations of fact within certain specified probabilities. In the case of civil litigation, the standard is that of the “preponderance of the evidence,” which “refers to proof which leads the trier of fact to find that the existence of fact in issue is more probable than not.” (Barron’s Law Dictionary, 1996). In essence, the proponents for the above argument, lack the recognition that all “good” (logically based) factual determination must be based on the integration of theoretically infinite factual probabilities that make the existence/nonexistence of the fact to be determined more or less likely.

The scope of neuropsychological practice and neuropsychological skill, experience, education, training and knowledge. Although courts universally recognize the utility of neuropsychology to educate the fact finder as to issues relevant to its field of study, a minority of courts are reluctant, and in some cases unwilling, to qualify neuropsychological experts as to the element of neuropathological causation in negligence actions of brain damage claims.

Although a minority of courts have looked to other sources and policy reasons, the rules governing admission of expert testimony clearly provide the answer. The solution, as already presented, may be established from within the governing rules of expert witness testimony. As applied to the field of neuropsychology, the rule follows: If it is assumed that the tests and procedures of neuropsychology may validly and reliably measure and explain a fact at issue, and the evidence to be presented has any tendency to make the existence of that fact more probable or less probable than it would be without the evidence and the particular neuropsychologist has the education and/or experience relating to neuropsychology and the evidence to be presented will be helpful to the trier of fact in a determination of fact, then the neuropsychologist may be qualified as an expert (Federal Rule of Evidence 702, 2000). Broken down into its constituent parts, this rule requires, at a minimum, two interrelated analyses. First, a determination must be made regarding the helpfulness to the trier of fact of the evidence to be presented; this includes a determination regarding the relevancy of the scope of the individual neuropsychologist’s expertise as to a fact at issue. Second, a decision must be made regarding the individual neuropsychologist’s competency regarding the evidence to be proffered; specifically, there are five areas to be analyzed: the witness’s knowledge, skill, experience, training, and education. The two principle difficulties with this rule are as follows: 1) The rule must be individually applied on a case-by-case basis, as the facts to which the expert must proffer opinion are different in each case and the scope of the expert’s competency is individual; and 2) The decision thresholds inherent in the wording of these rules allows for an especially subjective approach to qualification. Questions that may arise out of the ambiguous phraseology of these rules may include: How indirect must evidence be to be considered irrelevant? In the constantly evolving field of neuropsychology, what may be considered within the province of its scientific understanding or practice? When is an expert “helpful”? When is information within the understanding and information base of a layperson? When is the expert well enough educated, skilled, experienced, knowledgeable and trained?

Although, this case-by-case approach may be seen as a waste of judicial resources, it remains clear that the infinite complexity of reality, and therefore, the infinite possibilities for the scientific explanation of phenomena do not easily conform to a singular judicial holding. Withholding any philosophical debate as to the subjective nature of all decision-making, the qualification of any expert requires nothing less than a recognition of these ambiguities. From this viewpoint, it is within the responsibility of every trial judge to utilize the discretion afforded them out of precedential and legislative acknowledgment of these ambiguities. It is difficult to achieve much precision in this process, and therefore trial judges are afforded a broad range of discretion (pursuant to FRE 104(a) and its corresponding state rule) (Hamling v. United States, (1974); McCulloch v. H.B. Fuller Co., (1992)). This discretion may be exercised to disqualify experts due to lack of education, skill, knowledge, experience, or training; or if the experience is too far removed from the subject of the proposed testimony (United States v. Lopez, (1977)). Therefore, qualification requires an educated understanding of the current breadth of scientific knowledge within and shared by scientific fields of endeavor, as well as, an appreciation of the types of skill, experience, education, training and knowledge available in any particular science.

As the qualification of an expert witness requires an interrelated analysis of the experience of the individual with the facts to which that expert is proffered to testify, so is the scope of any science dependent on the skills, experience, education, training and knowledge of its practitioners as a group, and therefore, any discussion of scope must be made in that context.

Neuropsychology as a specialty within the field of psychology integrates scientific and professional understanding of psychology with neuroscience.

Developed as a clinical science within the past 70 years, neuropsychology is the study of the relationship between brain structure and function. It attempts to understand patterns of and variations of cognition, emotion and behavior in the context of cortical and subcortical neuroanatomical organization. Clinical applications of neuropsychology more specifically integrate the effects of brain dysfunction or damage on these same psychological and behavioral processes (Hartman, 1988).

Generally, neuropsychological training and experience are rigorous. A considerable number of individuals engaged in clinical neuropsychological practice today are not primarily educated in clinical neuropsychology; some neuropsychologists may have Master's degrees or doctorates in areas outside of clinical psychology (e.g., Ed.D.). Although not true of all practitioners labeling themselves as clinical neuropsychologists, as a specialty within psychology, neuropsychologists are generally required to fulfill graduate doctoral programs in clinical psychology or neuropsychology that include academic coursework, practical experience and the completion of a doctoral dissertation. These programs are guided by the training standards of the American Psychological Association (APA, 1996) and take an average of 7.1 years to complete, in addition to an undergraduate degree (National Research Council, 1989). Training includes coursework and experience in neuropsychology, pharmacology, comparative psychology, physiological

psychology, and the organic bases for psychopathology. A number of doctoral programs also require coursework in “medical” or “health” psychology in which the physiology and symptoms of medical pathology, as well as related psychological factors, are taught. APA accredited doctoral programs must require students to demonstrate competency in numerous areas, including: clinical assessment, treatment methods, theories of normal behavior and psychopathology, research design and methodology, ethics, and professional standards (APA, 1996). In addition, clinical experience must include broad-ranging experience working with diverse populations that must culminate in a 2000 hour supervised internship in no more than 24 months.

In addition to graduate education, a psychologist may not offer psychological services independently until, depending on the jurisdiction, licensure or certification. All jurisdictions in the U.S. require licensure or certification. Licensure and certification, once again depending on the jurisdiction, generally require a specified amount of supervised postdoctoral training, in addition to passing either a written or oral exam, or both.

Although there are some doctoral programs geared specifically and only to the training of neuropsychology, specialization in neuropsychology generally requires further training in addition to the curriculum required for practice in clinical psychology. Education and training in clinical neuropsychology has developed along with the specialty itself. However, there has been no well recognized delineation of an integrated education and training curriculum in clinical neuropsychology. In 1986, The International Neuropsychological Society Task Force on Education, Accreditation, and Credentialing of the APA Division of Clinical Neuropsychology, Division 40, created its *Guidelines for Doctoral Training Programs in Clinical Neuropsychology* (The Guidelines). These guidelines define the field and provide recommendations for training in clinical neuropsychology. Once again, in 1997, The Houston Conference on Specialty Education and Training in Clinical Neuropsychology (The Houston Conference) was held in which a diverse group of neuropsychologists convened with the aim of advancing an aspirational, integrated model of specialty training in clinical neuropsychology. Both the Guidelines and Houston Conference have been extensively utilized as templates for educational programming in clinical neuropsychology. These models both include education in brain-behavior relationships, including coursework and clinical experience in: Functional neuroanatomy; neurological and related disorders including their etiology, pathology, course and treatment; non-neurologic conditions affecting CNS functioning; neuroimaging and other neurodiagnostic techniques; neurochemistry of behavior (e.g., psychopharmacology); neuropsychology of behavior; foundations for the practice of clinical neuropsychology; specialized neuropsychological assessment techniques; specialized neuropsychological intervention techniques; research design and analysis in neuropsychology; professional issues and ethics in neuropsychology; and practical implications of neuropsychological conditions. These models further recommend a 2000 hour pre-doctoral supervised internship in clinical neuropsychology, as well as, between one and two years full-time, or the equivalent of, supervised post-doctoral training in the field. As well, to the extensive training prerequisite to being a fully licensed practitioner, a neuropsychologist may attain diplomate status after five years of additional experience, peer review and an examination by the American Board of Professional Psychology.

Neuropsychology is a well-respected and established scientific discipline, both in and out of the courtroom. Numerous professional journals are virtually devoted to neuropsychological research and practice (e.g., *Archives of Clinical Neuropsychology*, *Journal of Clinical and Experimental Neuropsychology*, and *Neuropsychological Assessment*). Numerous medical journals include neuropsychological research (e.g., *Neurology*, *Annals of Neurology*). Numerous law reviews and journals publish neuropsychological research (e.g., *Law and Human Behavior*, *American Journal of Forensic Psychology*). A vast array of books have been published concerning neuropsychological research and practice.

The original primary application of neuropsychological practice was the localization of brain lesions. As time passed, the increasing neuropsychological knowledge base led to development of procedures for predicting the nature of brain lesions (e.g., type of lesion, progressive nature of lesion, speed of progression, etc.) Included in these developments were processes for the determination of the causes for brain injury. Neuropsychologists are frequently utilized in the healthcare fields for diagnostic and treatment planning purposes; not only by neurologists, but by speech pathologists, physical and occupational therapists, etc. Outside of the healthcare fields neuropsychological assessment is regularly employed for determination of disability benefits, and other out of court decision making regarding liability issues. The qualification of neuropsychologists to testify regarding causation by the majority of courts, has established substantial precedence for the relevancy of neuropsychology to the causation of brain injury as discussed in Chapter I.

Neuropsychological assessment and diagnosis are more than merely a description of an individual's level of functioning, but rather it is a diagnostic process in which etiological determination of behavioral functioning is inherent to the fulfillment of the goals and standards of neuropsychological practice (APA, 1981; & APA, 1987). These goals, although somewhat contextually dependant, are generally 1) determination and description of behavioral functionality and possible aberrations in that functionality, 2) etiological determination of behavioral functionality, 3) determination of prognosis, 4) treatment planning, and 5) education regarding any of the previous mentioned goals where necessary (Lezak, 1995).

In establishing the existence of a brain injury, etiology, treatment, and prognosis, neuropsychological tests of cognitive and psychomotor skills are evaluated in the context of the particular patient's personality, possible motivators, and history. The results of these assessments must be evaluated taking into consideration relevant scientific research findings, including and in addition to, the results of other people identified as having similarly caused brain damage, and other medical problems with consistent symptomology profiles (Lezak, 1995).

Conclusion:

The issue of psychologists, especially neuropsychologists, being qualified to testify regarding issues of brain injury causation has indeed created a nationwide jurisdictional debate. Although

a minority of courts have looked to other sources and policy reasons, the rules governing admission of expert testimony clearly provide the answer. The governing rules of expert witness testimony require two elements: 1) the testimony be helpful to the trier of fact; and 2) the expert witness have knowledge, skill, experience, training, and education in the area of testimony. These rules must be individually applied on a case-by-case basis. It is difficult to achieve much precision in this process, and therefore trial judges are afforded a broad range of discretion. To accomplish this goal, judges must have an understanding of neuropsychological experience and scope related to etiological determination.

Neuropsychological training and experience are rigorous. It includes the completion of a doctoral degree in neuropsychology or clinical psychology, post-doctoral practical experience, and licensure or certification. In addition, a neuropsychologist may attain diplomate status.

The original primary application of neuropsychological practice was the localization of brain lesions. As time passed, processes were created for the determination of the causes for brain injury which include determination of the existence of any injury, estimation of premorbid functioning, comparison of premorbid and current functioning, and differential diagnosis. Neuropsychological etiological determination is substantiated by the weight of empirical clinical research which has concentrated on directly linking test scores, and therefore neurobehavioral functioning, to central nervous system damage. It is, therefore, now possible for an experienced neuropsychologist to utilize test batteries, in addition to other relevant data, to reliably establish the existence or absence and cause of brain damage (Milbert, Hebben & Kaplan, 1986).

CHAPTER IV

Protocol for the Qualification of Neuropsychologists as Expert Witnesses

As each case is different and every neuropsychologist unique, certain guidelines can be offered to judges as a protocol for proper application of the rules to qualify individual neuropsychologists or psychologists to testify. Although the guidelines of the protocol are intended to be useable as overarching principles or tests in the general determination of qualification of psychologists and neuropsychologists as expert witness regarding any issue, the protocol is presented here to specifically assist in proper determination of qualification of psychological or neuropsychological expert witnesses regarding the issue of neuropathological causation. As the processes of etiological determination and symptomology of different neuropathologies may fall more or less within the purview of neuropsychology as a science and the expertise of individual practitioners, the protocol is only meant to act as a guide to assist in judicial qualification of psychologists or neuropsychologists. These guidelines do not remove the case specific nature of qualification, but rather offer judges a narrower, more field specific direction to their determinations. Although the variety of neuropathology may be nosologically categorized to some extent, ultimately, the spectrum of neuropathology may be viewed as being as broad as the array of personal individual differences in the brain injured population. Although more neuropathology specific protocols may be useful and created for the determination of expert witness qualification, such a task is beyond the scope of this dissertation.

General protocol for the qualification of neuropsychologists to testify regarding causation of brain injury:

The Federal Rules of Evidence and its statutory equivalents are not a compendium of separate, unrelated rules. Rather, the rules are an integrated system of determining admissibility of evidence; as such, it is frequently not possible to make evidentiary determinations outside of the overall context of the system of the code. However, as previously discussed in Chapter I, there are a number of rules which apply to expert witness qualification.

Federal Rule of Evidence 702 is the central rule governing the admission of expert testimony. FRE 702 states, "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise."

Implicit in the requirement of FRE 702's phraseology "will assist the trier of fact to understand the evidence or to determine a fact in issue," is FRE 401's requirement that the evidence be relevant. "Relevant evidence" means evidence having any tendency to make the existence of any fact that is of consequence to the determination of [the issue] more probable or less probable than it would be without the evidence" (FRE 401).

The Federal Rules do, however, provide the basis for some exceptions. Although not directly related to the qualification of expert witnesses, it must be noted, that if qualified FRE 403 gives the trial judge the power to discretionarily exclude testimony if “...its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.”

The rules for qualification of an expert witness to testify essentially requires that the testimony to be offered will be relevant to the facts at issue, the expert be qualified by experience or education in an issue relevant area that distinguishes him/her from an ordinary person, and the expert’s testimony will be helpful to the trier of fact in its determinations. At first glance, the elements for expert witness qualification seem quite straight forward. However, as the circumstances of each case are different and every neuropsychologist unique, the application of this rule may actually be quite complex.

Broken down into their constituent elements, the rules for qualification as applied to a neuropsychological/psychological expert witness essentially require the following general questions be answered (As the scope of this dissertation is mainly concerned with neuropsychological expert witness qualification, these questions will be worded according to that context. However, these same questions may be changed for application to psychologists):

- 1) To what extent is the scope of knowledge, skill, experience, training, and education of this individual neuropsychologist relevant to an understanding of the issue/s for which he will testify?
- 2) To what extent is the depth of knowledge, skill, experience, training, and education of this individual neuropsychologist sufficient to reasonably understand the issue/s for which he will testify?
- 3) To what extent is the testimony to be offered helpful to the fact-finder in determination of a fact at issue?

Essentially, these questions create a balancing test with each of them only answerable by a matter of degree. Such a test does not easily fit into the “yes/no” dichotomous decision-making eventually required for determination of expert witness qualification. To compound the difficulty, each of these questions require, to some extent, an underlying conceptualization of the case specific and expert specific topics subject to the questions (e.g., scope of neuropsychological experience, processes of neuropsychological etiological determination, types of evidence for neuropathological injury). It is, therefore, within the obligation of every trial judge to utilize the discretion afforded them out of precedential and legislative acknowledgment of these ambiguities. It is difficult to achieve much precision in this process, and therefore trial judges are afforded a broad range of discretion.

It consequently becomes necessary to offer an explanation of the factors inherent to answering each of the inquiries necessary for a finding of neuropsychological qualification. Due to the limited nature of the subject of this dissertation, these inquiries will be specifically applied to qualification of individual neuropsychologists to testify regarding neuropathological existence and causation. As previously noted, when discussing the neuropsychologists role in determining both the existence and etiology of neuropathology, such determination is limited to the central nervous system pathology. Figures 1 – 3, to be presented, offer a simplified visual representation of the primary elements inherent to resolving these issues. To simplify the wording in the following clarification of these elements, the phrase “educational experience” will connote all knowledge, skill, experience, training, and education.

To what extent is the scope of knowledge, skill, experience, training, and education of this individual neuropsychologist related to an understanding of the neuropathological issue/s for which he will testify? As obvious from its wording, the resolution of this element necessitates an inquiry into the scope of the individual neuropsychologist’s educational experience. As previously discussed, the scope of neuropsychology has significant overlap with both neurology and psychology. Figure 1 illustrates the overlapping scope of these fields of study which are most relevant to an understanding of neuropathological issues. As formerly mentioned, there is no “best evidence rule” for expert witness qualification in the American jurisprudential system, and as such, the question of which field of study an expert is defined by is irrelevant to a determination of qualification. Rather, such a continuum of fields of study is presented as a guide for recognition of the issues for which they are more likely to be relevant, and therefore, the issues relevant to an inquiry into qualification. As such, it is necessary for determinations of qualification to be made by judges with, at least, a general understanding of the scope of the proffered expert’s field of study.

The determination of the extent the scope an individual neuropsychologist’s educational experience relates to an understanding of the neuropathological issue/s for which he will testify requires a consideration of two factors. First, there must be consideration of the scope of the individual neuropsychologist’s educational experience. Second, an inquiry must be made into the relatedness of such educational experience to the neuropathological fact at issue. Although these issues may seem separate, they must be considered as a singular integrated inquiry utilizing the neuropathological fact at issue as the frame of reference for the determination of the relatedness of the individual neuropsychologist’s scope of educational experience. Such an inquiry requires a bottom-up approach, moving from the general to more issue specific educational experience. Essential to this process must be an initial recognition of the scope of educational experience relevant and necessary to an expertise in the specific issue for which the neuropsychologist is proffered to testify. Figure 1 illustrates the relatedness between the dimensions defined by the inquiry.

As illustrated in Figure 1 a): As the scope of educational experience shifts toward an emphasis on the biological or physiological understanding of brain injury, the more it is within the purview of medicine/neurology. As the scope of educational experience shifts more toward the

neurobehavioral, the greater its correlation with the neuropsychological field of study. As the scope of educational experience is more removed from the neurobehavioral and becomes more one of behavior and personality, so does it become further within the sphere of psychological study. Although, the general scope of a field of study may be more toward one perspective of understanding neuropathology than another, this does not necessarily indicate an individual practitioner's scope of educational experience. Practitioners may have substantial specialized knowledge more within the purview of another field of study outside of their own field. For example, a neuropsychologist may have substantial educational experience with brain imaging techniques, an area usually considered to be more within the purview of radiology or nuclear medicine.

It must be once again emphasized, that although neurology, neuropsychology, and psychology are divergent fields, they all have significant overlap. Such overlap is underscored by the applications of these fields of study in their bases for expert witness testimony regarding neuropathological issues. As seen in Figure 1(a)(1), as the basis for an expert witness' opinion testimony regarding the existence or etiology of neuropathology relies more on tests of a physical nature (i.e., CAT, MRI), the more likely such bases fall within the field of medicine (i.e., neurology). However, as the basis for an expert witness' opinion testimony regarding the existence or etiology of neuropathology relies more on neurobehavioral assessment, so increases the degree to which such bases are within the practice of neuropsychologists. Finally, as the basis for an expert witness' opinion testimony relies more on behavioral/personality measures, the greater the degree to which such bases are within the practice of psychologists. As previously presented, this does not necessarily confer on the neuropsychologist/psychologist the legal capacity to utilize tests solely within the licensure of physicians, for they may not; or may a neurologist or other physician have the training or capacity to perform neuropsychological/psychological tests. Rather, there is a significant crossover of medical and neuropsychological understanding in the existential/etiological diagnosis of brain injury. Due to such a crossover, it is within common practice for neurologists, neuropsychologists, and psychologists to utilize the results of each others' evaluations in making their own field relevant evaluations.

The type of pathology for which expert witness testimony is proffered must be used as a guide through which consideration of the individual expert's educational experience is analyzed. It is both time consuming and outside of reason to consider all educational experience of an individual in determination of the extent of relation between scope of educational experience and the issue for which expert opinion is proffered. Rather, as previously stated, such an inquiry requires a bottom-up approach, moving from the general to more issue specific educational experience.

Although the variety of neuropathology may be nosologically categorized to some extent, ultimately, the spectrum of neuropathology may be viewed as being as broad as the array of personal individual differences in the human population. However, the applied sciences of neurology, neuropsychology, and psychology are each able to make existential and etiological determinations of pathology based on numerous indices such as patient history, circumstances of the alleged incident, physical and behavioral examination of the patient, etc. As such evidence

converges in terms of patterns of symptomology, historical and circumstantial support, etc., practitioners may further support or rule out the existence or etiology of specific neuropathological diagnoses by utilizing measures specifically tailored to these tasks. For example, after a generalized neuropsychological battery, neuropsychologists may perform more specific tests to more accurately measure strengths or deficits (e.g., memory, planning, and sequencing) evidenced on the generalized battery (Lezak, 1995). It has been argued that the validity and reliability of such a flexible approach is somewhat questionable (Williams 1997). In addition to tailoring assessment techniques to specific neuropathology, much of the measurement that goes into forensic assessment of neuropathology is task driven.

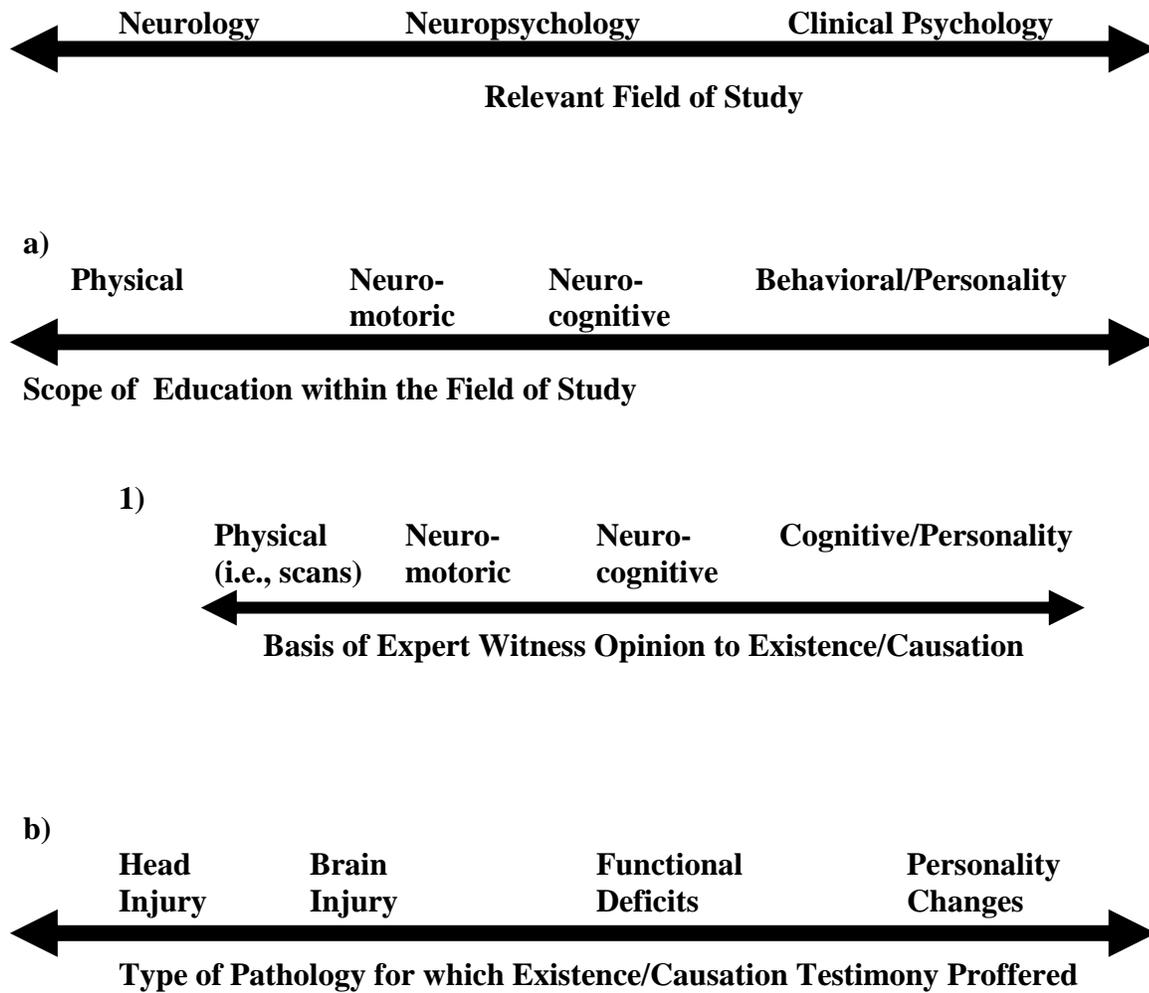
Since the basis, and therefore the scope of educational experience, necessary for a qualifiable expert opinion may only be determinable according to the pathology and issue for which the testimony is proffered, it becomes necessary to have, at least, a minimal understanding of the educational experience relevant to the processes of determination of the specific issue at bar. For example, to determine the scope of education necessary to a specialized and reasonable understanding of the existence of a memory disorder, a judge must have, at least, a minimal knowledge of the educational experience necessary to competently perform memory tests and evaluate their results. This education might include classwork in memory disorders and neuropsychological assessment, experience evaluating patients with memory disorders, research in memory disorders, etc. Such a pathology and issue specific inquiry must be done on a case-by-case-basis. However, there are commonalities in these processes. For example, as seen in Chapter II, there are certain specific processes utilized in the neuropsychological determination and explanation of neuropathological causation.

As certain pathologies and issues are more determinable by one form of measurement than another, and as certain types of measurement are more within the purview of one field of study than another, the determination of certain pathologies may therefore be more likely to be within the usual scope of one field of study than another. Figure 1(b) illustrates the dimension of general type of pathology for which expert witness opinion is proffered. Generally speaking, as the pathology for which an expert witness will testify becomes one of a physical/medical nature, such as a head injury, the more likely the basis for that testimony will necessitate physical measurement or examination of the patient, and therefore more likely the need for a scope of educational experience which includes physical measurement and examination, which is more likely to be within the purview of neurology. Pathology in which injury to the brain is involved will likely entail measurement and examination within many dimensions such as the physical (e.g., brain imaging studies), neuromotor (e.g., examination of motor functioning), neurocognitive (e.g., examination of memory and cognition), and behavioral (e.g., examination of motivation and personality change). The broad examination necessary to determine the issues of existence and/or causation may likely simultaneously fall within the purview of neurology, neuropsychology, and psychology. Other times, such as in cases of mild traumatic brain injury, although there may be a brain injury, the only evidence of that brain injury, other than a temporal contiguity between the alleged incident and the onset of functional deficits, may be behavioral or

related to personality, and as such, being more within the purview of neuropsychology or psychology than neurology.

Figure 1

Relation of the scope of knowledge, skill, experience, training, and education of the expert witness to an understanding of the issue/s of neuropathological existence and causation.



Application to causation. As follows from the above discussion, inquiry into the qualification of the individual neuropsychologist to testify regarding neuropathological causation requires a more specific investigation of the neuropsychologist's scope of educational experience. This investigation must be specific to the etiological determinative process utilized in general and specifically to the type of pathology the plaintiff is alleged to have suffered.

As elucidated in Chapter II, neuropsychological etiological determinations are based on numerous factors including pattern analysis of functional deficits in the context of the patient's history, patterns of recovery, consideration of psychological factors, timelines of the alleged incident and cognitive changes, analysis of the incident itself (e.g., analysis of the neurophysics of a MVA), etc., while utilizing the expertise of the medical community to confirm and rule out other possible causes which may be less amenable to behavioral diagnostics. These factors must not necessarily be based on the neuropsychologist's own observations or their own area of expertise, rather, they must only have a reasonable basis on which they may rely in forming their opinion (FRE 703). By integrating data gleaned from these numerous factors neuropsychologist may be able to determine, within varying levels of certainty, both the type and extent of an underlying physical injury and its likely cause/s. For example in closed head impact injuries, certain areas of the brain are particularly vulnerable to damage regardless of the site of impact, and characteristic patterns of deficits can be expected (Feinberg & Farah 1997, Lezak, 1995, & Vanderploeg, 2000).

The inquiry requires that the neuropsychologist's scope of educational experience include an understanding of the processes and factors utilized both in general neuropsychological etiological assessment and the specific pathology with which the case is concerned. This includes an examination of the processes of determination of the existence of any injury, creation of a best estimate of premorbid functioning, comparison of premorbid and current functioning to determine changes in functioning, and establishing a causal nexus which connects the changes in either the neurology of the brain or its behavioral manifestations to phenomena. Some of the factors utilized in these processes of etiological determination are common knowledge (i.e., timeline of the alleged injury causing incident), however, queries regarding education with the integration of such knowledge with more specialized knowledge may be necessary. To require a judge to become an amateur scientist in such matters is unnecessary, however, some level of education and research may be necessary. As the scope and diversity of the factors and processes utilized in neuropsychological etiological determination is extremely broad, it is beyond the scope of this dissertation. The complexity of these processes is far too great to offer any general rules of thumb, however, for a brief description of these processes the reader is referred to Chapter II.

Conclusion. It becomes evident that the necessary scope of educational experience of an individual neurologist, neuropsychologist, or psychologist to reasonably understand and offer a qualified opinion is highly dependant on the background of pathology type or issue for which that opinion is offered. Ultimately, determinations of the relatedness of an individual practitioner's scope of educational experience to the issue at bar are case specific and requires some level of discretion on the part of the trial judge. This discretion should be exercised from the standpoint that the rules for qualification are quite liberal and meant to include all relevant

evidence. However, as will be discussed in the following section, the depth of the expert's educational experience must also be a factor in qualification.

To what extent is the depth of knowledge, skill, experience, training, and education of this individual neuropsychologist sufficient to reasonably understand the neuropathological issue/s for which he will testify? The resolution of this element necessitates an inquiry into the depth of the individual neuropsychologist's educational experience. Figure 2 illustrates that the sufficiency of an individual neuropsychologist's educational experience to reasonably understand the neuropathological issue/s is dependent on the depth of that experience. As such, it is necessary for determinations of qualification to be made by judges with, at least, a general understanding of the possibilities for educational experience attainable.

The knowledge, skill, training or education of the professional who is proffered as a neuropsychological expert witness should have been extensive and rigorous. Regrettably, this is not the case for all experts.

The label of "clinical neuropsychologist" does not guarantee proficiency. A considerable number of individuals engaged in clinical neuropsychological practice today are, as one observer has remarked, "psychologists who have taken three-day workshops learning to administer the Halstead-Reitan or Luria- Nebraska batteries(Smith, 1994)."

As discussed in Chapter II, as a specialty within psychology, neuropsychologists are required to complete graduate doctoral programs in clinical psychology or neuropsychology. Ordinarily, doctoral programs in neuropsychology produce clinical psychologists with thorough training in traditional clinical psychology and varying levels of education in brain-behavior relationships. The quality of these graduate programs varies considerably (Smith, 1994). In addition to graduating from a doctoral program, a psychologist may not offer psychological services independently until, depending on the jurisdiction, licensure or certification. All jurisdictions in the U.S. require licensure or certification. Licensure and certification, once again depending on the jurisdiction, generally require a specified amount of supervised postdoctoral training, in addition to passing either a written or oral exam, or both. As well, to the extensive training prerequisite to being a fully licensed practitioner, a neuropsychologist may attain diplomate status after five years of additional experience, peer review and an examination by the American Board of Professional Psychology.

Although increasing the likelihood of competency and, therefore, qualificability of a neuropsychologist, neither licensure in clinical psychology, nor board certification in neuropsychology absolutely guarantees suitable depth of educational experience. In view of the fact that the range of competency existent within the population of those labeling themselves as neuropsychologists is quite broad, it is recommended that a thorough review of the proffered expert's formal educational training, practical experience and scholarly works be conducted for support of expertise in the specific areas for which he will be proffered to testify. As the similarity of this inquiry between all pathologies and issues, including causation of

To what extent is the testimony to be offered helpful to the fact-finder in determination of the neuropathological fact at issue? The resolution of this element (“helpfulness”) requires a three-part analysis: 1) An inquiry into the probative value of the neuropsychological opinion proffered for fact-finder determinations (“probative value”); 2) An inquiry into the capacity of the lay fact-finder to determine the issue at bar (“lay capacity”) and 3) An inquiry into the extent which neuropsychological expert opinion overlaps with a lay capacity to evaluate the issue/s at bar. Helpfulness can be expressed by the following formula:

$$\text{Probative Value} - \text{Lay Capacity} = \text{Helpfulness}$$

Figure 3 illustrates the relationship of these factors in the analysis of the element of helpfulness to the fact-finder.

As previously discussed in Chapter II, determination of neuropathological issues may be determined by investigation and analysis of numerous factors. By integrating data gleaned from these numerous factors neuropsychologists may be able to determine, within varying levels of certainty, both the type and extent of an underlying physical injury and its likely cause/s. Some of these factors may have significant overlap with the factors commonly utilized by lay fact-finders in their determinations. For example, the temporal proximity between the alleged causative incident and the onset of the alleged behavioral changes or deficits may be useful for both the neuropsychologist and the fact-finder in determining a causative nexus between the alleged incident and the damages thereby suffered by the plaintiff. Therefore, helpfulness may be considered as the degree to which the expert’s specialization through its understanding and integration of the data can augment the fact-finder’s recognition and understanding of the issues at bar.

Figure 3 illustrates the relationship between helpfulness to the fact-finder (“helpfulness”) and the extent to which the probative value of neuropsychological expert opinion (“probative value”) overlaps with a lay capacity to evaluate the issue/s at bar (“lay capacity”). There is an inverse relationship between helpfulness of an expert opinion and the extent to which that opinion overlaps with a lay capacity to evaluate the issue. In other words, as the degree to which the probative value of neuropsychological expert opinion surpasses a lay capacity to evaluate the issue/s at bar, so increases the probability that the opinion will be helpful to the fact-finder in the determination of the issue/s at bar.

The first step in determining helpfulness must be a consideration of the probative value of the proffered expert opinion. Probative is defined as “Tending to prove or disprove.” (Black’s Law Dictionary, 1999). The probative value of an expert opinion is, therefore, the extent to which the opinion tends to prove or disprove the issue for which it is proffered. Figure 3(a) illustrates the relationship between probative value and helpfulness. As probative value increases, so does the extent to which the opinion becomes helpful to the fact-finder in its determinations. This may seem redundant, however, the difference between helpfulness and probative value lies in the

possibility for an expert opinion to be probative yet not be helpful. This may be explained by the situation in which an expert opinion, although probative of an issue, may possibly add nothing beyond the fact-finder's capacity to recognize and understand the issue; such may be the case where there is total overlap between the probative value of an expert's opinion and that of the lay fact-finder to evaluate the issue at bar.

A full discussion regarding determinations of probative value is beyond the scope of this dissertation. It is however, sufficed to say, that in determining probative value, it is necessary to examine the processes and factors utilized in developing the underlying logic of the expert opinion, as well as, the substance of the opinion itself. Such an examination will by nature range from one focusing on general processes and substance of neuropathological issue determination to the more pathology specific, and finally to the case-specific details. In other words, the trial judge must determine the probative value based on the following questions: 1) If the tests and processes used by this expert are valid and reliable, may there be a logical relation between their results and the existence of any fact that is of consequence to the determination of the issue?; and 2) To what extent does the expert opinion have a tendency to make the existence of any fact that is of consequence to the determination of the issue more probable or less probable? It is important to note, that such determinations should not be made with considerations of validity and reliability of the processes and factors to determine the issue. Rather, the validity and reliability must be assumed.

In other words, if an expert utilizes specific tests and processes in forming an opinion relevant to an issue, and if such an opinion can be reasonably formed by using such tests and processes (assuming they are valid and reliable), then the expert opinion may be considered, for purposes of qualification, as having probative value. At best, determinations of probative value are rough approximations based on the expert's propositions regarding his or her capacity for determination of the issue within a reasonably logical framework. If brought to bar, issues of admissibility based on the validity and reliability of the basis of the expert opinion are, therefore, to be determined post-qualification.

Arising out of the necessity for assuming validity and reliability in determinations of probative value is the following problem: "Can the probative value of an expert's opinion be determined without considering the validity and reliability of the tests and processes utilized in forming that opinion?" It seems counterintuitive to consider an expert opinion as probative of an issue when the underlying basis of their testimony may be invalid and/or unreliable. From the proposed balancing test, one could theoretically qualify a phrenologist (a person who claims to be able to determine an individual's personality by the bumps on their head) as long as the phrenologist had the educational experience regarding an issue at bar. The rationale, however, for applying such a test as proposed emerges out of the judicial system's need to separate matters of individual expert qualification and admissibility based on the validity and reliability of the underlying scientific tests and processes used in forming an expert opinion. By separating these issues, the initial task of qualification becomes simplified and less demanding of the time and resources of the court.

Simplification occurs because of the lack of extra inquires into separate constructs in an already complex balancing test. To consider the validity and reliability of the underlying basis of an expert opinion would require consideration of two separate yet related constructs: 1) the capacity of the individual expert to educate and opine, from the perspective of their field of study, regarding a relational or existential phenomena; and 2) The capacity for that field of study to “truly” describe and/or predict phenomena within certain probabilities. Although both of these considerations are relevant to the “actual” probative value of an expert’s testimony, to combine them would likely create greater confusion in an already difficult judicial situation. This is not to say that combination of these issues is implausible, but rather it may be argued, that like the scientific paradigm of deconstruction and nosological categorization of phenomena for increased understanding, judicial determinations of qualification and admissibility may become less erroneous and equitable when broken down into their more constituent parts.

The sequence of consideration of the issues with qualification of the individual expert being followed by issues of admissibility is founded on the significantly more complex inquiry, and therefore, greater expense possible in resolving issues of admissibility regarding the validity and reliability of the underlying scientific method of which the expert’s opinion is based upon

Following consideration of probative value, must be deliberation regarding the capacity of the lay fact-finder to evaluate the issue/s at bar. See Figure 3(b) for an illustration of the relation between lay capacity and helpfulness. Expert testimony is presumptively helpful unless it is within the capacity of the lay fact-finder to evaluate the issue at bar. Matters within everyday knowledge and experience are within the purview of the fact-finders capacity (Kopf v. Skyrm, 1993). Expert testimony is properly excluded "when it is not needed to clarify facts and issues of common understanding which jurors are able to comprehend for themselves." (Hibiscus Assocs. v. Board of Trustees, 1995; CMI-Trading, Inc. v. Quantum Air, Inc. (1996); Roback v. V.I.P. Transp. Inc. (1996); London v. MAC Corp. (1995), cert. denied, 116 S. Ct. 99 1995); Beech Aircraft Corp. v. United States, (1995); Justice v. Carter, (1992); Persinger v. Norfolk & W. Ry., (1990). Therefore, following inquiry into the probative nature of the expert opinion, must be an investigation into the capacity for the lay fact-finder to evaluate the issue at bar. The possible types and breadth of factors which may go into lay fact-finding are inherently specific to the facts and issues of the case and the evidence to be presented in supporting or refuting those facts.

Finally, there must be an inquiry into the extent which the probative value of the neuropsychological expert opinion overlaps with a lay capacity to evaluate the issue/s at bar. This examination must be conducted with the goal of answering the following question: “To what extent can the fact-finder reach the same conclusions with a similar level of certainty?” The factors involved in determination of this question are inextricably linked to the specific facts of the case and the particular expert opinion. In addition, the breadth and complexity of possible factors involved may be quite complex. Ultimately, the determination of the extent of overlap between the expert opinion and the lay capacity to evaluate the issue at bar must rely on a reasonably based qualitative decision-making process, relying on an informed understanding of

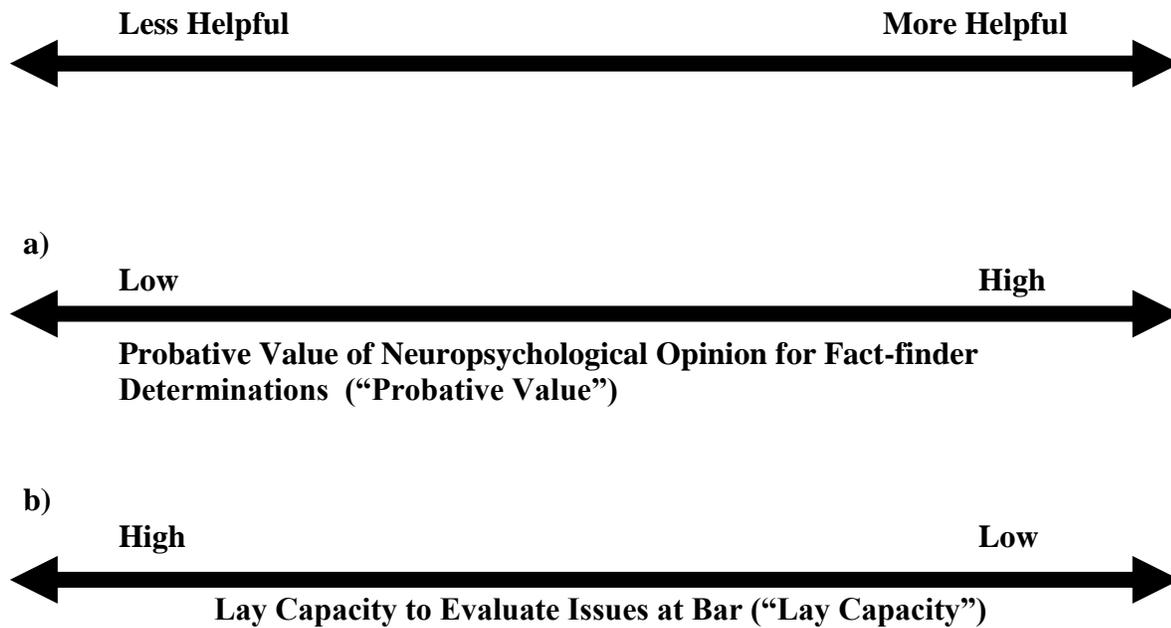
the scope and depth of the expert's educational experience, the scope and depth of lay decision-making capacity, the processes and factors which comprise the underlying basis of the expert opinion, and the specific facts of the case.

In an analysis of helpfulness, although much of the basis for an expert's opinion may be within the understanding of the lay person (e.g., temporal proximity between incident and onset of functional deficits), it becomes important to recognize that the extent of overlap is not to be determined by the mere quantity of factors or the sheer volume of information utilizable by both the expert and the fact-finder in their determinations, but rather, the extent to which the expert's specialization through its understanding and integration of the data can augment the fact-finder's recognition and understanding of the issues at bar. From this perspective, a positive determination of helpfulness can be concluded, even though all the factors and information utilized by the expert in forming an opinion were utilizable by the fact-finder in its determinations.

Although not directly related to the qualification of expert witnesses, it must be noted, that once qualified FRE 403 gives the trial judge the power to discretionarily exclude testimony if "...its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

Figure 3

Helpfulness to the fact-finder in determination of a neuropathological fact at issue.



Formulaically:

$$*Probative Value - Lay capacity = Helpfulness*$$

Application to causation. As follows from the above discussion, inquiry into the qualification of the individual neuropsychologist to testify regarding neuropathological causation requires a more specific investigation of the helpfulness of the proffered expert opinion. In determining the helpfulness of a neuropsychologist's expert opinion regarding neuropathological etiology, the processes and factors utilized in etiological determination must be considered in terms of both their probative value and the extent to which they overlap with the capacity of the lay fact-finder to determine causation.

As elucidated in Chapter II, neuropsychological etiological determinations are based on numerous factors. By integrating data gleaned from these numerous factors neuropsychologist may be able to determine, within varying levels of certainty, both the type and extent of an underlying physical injury and its likely cause/s.

The determination of the probative value of the neuropsychologist's expert opinion regarding neuropathological causation must be based on the capacity of the etiological determinative process utilized in general and specifically to the type of pathology the plaintiff is alleged to have suffered, and the specific facts of the case. At best, since the validity and reliability of the tests and processes used as a basis in forming the expert opinion must be assumed, determinations of probative value are rough approximations based on the expert's averments regarding his or her capacity to determine causality within a reasonable logical framework. In other words, the trial judge must determine the probative value based on the following questions: 1) If the tests and processes used by this neuropsychologist are valid and reliable, can there be a logical relation between their results and the causation of the alleged neuropathology?; and 2) To what extent does the neuropsychologist's opinion tend to prove or disprove the causal nexus between the alleged incident and the alleged neuropathological damages?

Determination of the lay capacity to evaluate neuropathological etiology requires a general understanding of the factors within the common knowledge of lay people generally utilized in determining causation. Although the possible types and breadth of these factors are largely specific to the facts and issues of the case, one factor is common to causative determination in brain injury cases: The temporal contiguity between the alleged causative incident and the alleged damage (e.g., brain injury, cognitive deficits). Otherwise, there is little else within common knowledge that is generally utilized in determination of brain injury causation.

Lastly, there must be an inquiry into the extent which the probative value of the neuropsychological expert opinion overlaps with a lay capacity to evaluate the issue of causation. As the factors involved in etiological determination are inextricably linked to the specific facts of the case and the particular expert opinion, and the breadth and complexity of possible factors involved may be quite complex. Ultimately, the determination of the extent of overlap between the expert opinion and the lay capacity to evaluate the issue of causation must rely on a reasonably based qualitative decision-making process, relying on an informed understanding of the scope and depth of the expert's educational experience related to causative determination of neuropathology, and the scope and depth of lay decision-making capacity.

Conclusion:

In summation, the fields of neurology, neuropsychology, and psychology specialize in understanding the human brain. Each of these fields offers its own specialized perspective through which to understand brain injury. The neurologist focuses on the physical nature of the brain, the neuropsychologist on the brain-behavior relationships, and the psychologist on behavior and personality. Each of these fields may, and frequently does, rely on each others' understanding of brain injury to form expert opinions regarding issues such as existential diagnosis and etiological determination of brain injury. Each may be helpful to the trier of fact in determinations of neuropathological issues.

The determination of expert witness qualification regarding any issue, including neuropathological causation, must require a case-by-case balancing test. The question should not be "Are neuropsychologists (or neurologists or psychologists) qualified to testify regarding the issue at bar?" Rather, the question must be "Is this specific neuropsychologist (or neurologist or psychologist) qualified to testify regarding the issue at bar?" Such a test must consider and weigh against each other 1) the scope of the individual's knowledge, skill, experience, training, or education in the context for which that person will be proffered as an expert, 2) the depth of that knowledge, skill, experience, training, or education, and 3) the helpfulness of that individual to the trier of fact in determination of an issue at bar. Essential to this process is, at least a minimal, understanding of the scope and type of educational experience of the field of the proffered expert's specialization, and the processes by which that specialization bases its determinations of the specific issue at bar.

As each brain injury case brings with it issues that may only be answered from within that context. It must therefore be recognized that the guidelines offered are a starting point which like any test must be applied to the specific situation. As such, the guidelines do not cover the entire gamut of questions that a judge may utilize in determining qualification. Rather, they are a starting point to assist in recognition of the relevant questions in a qualification inquiry. A balancing test, such as the one offered, may be applied to issues of causation or any other issue for which a neuropsychologist may be qualified. Qualification of any expert regarding any issue may not be simply boiled down to a simple calculus of the factors involved, but rather requires an informed and educated understanding of the knowledge available within a given field of study, its value when logically applied to the issues; and an intuitive and experiential understanding of the lay capacity to evaluate issues, both simple and complex.

A number of recommendations can be made to further improve the status of clinical forensic neuropsychology in the courtroom, and therefore increase the likelihood of its qualification and admissibility. These include: 1) Enhancing understanding of both attorneys and neuropsychologists as to the divergent roles of clinical and forensic practice; 2) Increasing the use of probabilistic information in the legal decision making context; 3) Augmenting persuasive ability of forensic neuropsychological testimony, by creating reasonable standards of certainty within the field allowing for fair and ethical, yet more definitive testimony; 4) Furthering

research as to more validly and reliably objectify and categorize neurobehavioral pathologies; 5) Continuing research toward establishing more valid and reliable neuropathological base rates; 6) Supplementing research on the validity and reliability of assessment techniques; 7) Increasing use of more standardized assessment techniques in the forensic arena; 8) Establishing standardized and valid history taking procedures to increase validity and reliability of determination of prior functional status; 9) Intensifying research and development of tools for detecting both unconscious and intentional faking and malingering; and 10) Utilizing technological advances to integrate complex data in neuropsychological decision-making.

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