

**The Neuropsychological Effect Of Expert Testimony Language Complexity On Legal
Factfinder Decision-Making In The Mild Traumatic Brain Injury Case**

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ABSTRACT

Due to the ambiguous nature of mild traumatic brain injury, it is one of the most frequently litigated and tried issues within the forensic neuropsychological arena. The neuropsychological assessment and subsequent testimony used to explain mild traumatic brain injury to the legal fact-finder is relatively technical and complex functional evidence. This discussion will extrapolate the effect of expert testimony language complexity on legal factfinder decision-making in the mild traumatic brain injury case.

Chapter I Introduction

“When I use a word,” Humpty Dumpty said, in rather a scornful tone, “it means just what I choose it to mean – neither more nor less.”

“The question is,” said Alice, “whether you can make words mean so many different things.”

“The question is,” said Humpty Dumpty, “which is to be master – that’s all.”

-- **Lewis Carroll**, *Through the Looking-Glass, and What Alice Found There* (1871)

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 the physical pathology. The forensic neuropsychologist’s declarations pertinent to employment, academic and social issues often have a great influence on the value of a civil litigation case. Disability attributable to neurological impairment can also have a significant impact on the *mens rea* of a defendant during the commission of a crime and can greatly persuade judge and juror decision-making related to guilt, sanity, and sentencing issues.

Although other disciplines may also address the subject-matter associated with the claimant’s neurobehavioral disability, the stringency of a comprehensive neuropsychological examination consistently confers superior credibility and significance to the opinions advanced by the forensic neuropsychologist’s reports and testimony. Nonetheless, to perform as a skilled forensic expert, the neuropsychologist need not only be competent as a clinician but furthermore be experienced in the particular considerations that go into practicing effectively in the forensic arena.

Knowledge is only a prerequisite to being of service to the court. The effective dissemination of information, at least at a practical level, is as important to courtroom functioning as having the knowledge. In other words, a competent expert must, in addition to being knowledgeable, be persuasive. In order to be persuasive in the courtroom setting, a neuropsychological expert witness must be perceived by the judge and jury as being a credible source of information. Ideally, the most credible expert witness is the one that most accurately educates the factfinder. However, a number of factors extraneous to the accuracy of the expert testimony significantly affect judge and jury perceptions of expert witness credibility. It has been posited that these extra-evidentiary factors have been found to increase in effect as evidence becomes increasingly ambiguous or incomprehensible (Bank & Poythress, 1982).

Of particular interest are the effects of presentation or style of delivery. Legal experts are well attuned to the importance of presentation of style:

“In the context of the traditional adversary proceeding, the personality of the expert becomes more important than the subject about which he is testifying. The jury is more easily persuaded to a desired line of thinking by personal or friendly experts....This is true whether or not what he says is technically or medically truthful. Thus, a pleasant demeanor may mean more to a juror than the experts knowledge” (Moenssens, 1974).

An intriguing series of studies by William O’Barr (an anthropologist) and his colleagues Allan Lind (a psychologist) and John Conley (a lawyer) has shown that certain speech styles carry greater credibility than others. O’Barr’s research group identified four specific contrasting styles of speech that occur frequently in the courtroom and significantly affect factfinder decision-making: 1. powerful vs. powerless speech; 2. narrative vs. fragmented testimony; 3. hypercorrect speech; and 4. simultaneous speech (O’Barr, 1982).

Of even more particular interest is the effect of complexity of language on factfinder decision-making. It has been found that language containing technical terminology and jargon or using infrequent words and grammatic structures may be difficult for the layperson to comprehend and subsequently less credible (e.g., ABA, 1989; Christy, 1979; Dietz, Cooke, Rappeport, & Silvergleit, 1983; Forsterlee, Horowitz, Bourgeois, 1993; Shuman, Champagne, & Whitaker, 1996). However, other studies have shown, that it is not quite that simple; other factors both contribute to and mediate the effects of argument comprehensibility, most importantly are source characteristics, such as expert witness status or credentials (*see for example*, Cooper, Bennett, Sukel, 1996; Hafer, Reynolds, & Obertynski, 1996). These studies show that when arguments are easy to comprehend, attitudes are more favorable when the arguments are strong versus weak; and when arguments are difficult to comprehend, attitudes are more favorable when the source is of high versus low status. In other words, as the argument strength weakens, the effects of message comprehensibility give way to other factors, such as, source status.

Due to the ambiguous nature of mild traumatic brain injury, it is one of the most frequently litigated and tried issues within the forensic neuropsychological arena. The neuropsychological assessment and subsequent testimony used to explain mild traumatic brain injury to the legal fact-finder is relatively technical and complex functional evidence. However, neuropsychological testimony of mild traumatic brain injury continues to be recognized as a powerful explanatory tool of persuasion by attorneys. This discussion will extrapolate the effect of expert testimony language complexity on legal factfinder decision-making in the mild traumatic brain injury case. In particular, although neuropsychological testimony of mild traumatic brain injury is relatively technical and complex evidence, when language is comprehensible by jurors, jurors assessments of the expert’s credibility increase, as the effects of source characteristics (source status in this case) decrease.

Overview of Being an Expert Witness:

Laws are constructed to supply formal proceedings for resolving disputes in order for society to preserve order (Rawls, 1997). By definition, any dispute will have conflicting or

adversary positions. Within this adversarial setting, it is the position of the factfinder (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 decisionmaking. 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.

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, expert witness evidence is grounded upon observations after the fact.

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 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; and second, the expert witness must possess proficiency, scholarship, and experience in their purported field of expertise.

Expert Opinion. As a result of the assumption that the expert can regard the facts in his/her field of expertise unambiguously, it is further accepted that the expert can identify the legal difference between fact and opinion. In neuropsychology, as in other disciplines, this inflexible differentiation between fact and opinion is troublesome to preserve as in reality there is more of a continuum rather 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. Consequently, the neuropsychologist will deduce from literature and experience, together

with evaluative and experimental data, to submit an expert opinion. Neuropsychological opinion may be rendered on a number of issues including, but not limited to, whether an individual has a cognitive, sensory-motor or emotional disturbance, whether such disturbances conform to the severity and 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/she is only assisting the factfinder, rather than establishing the facts of the case.

Expert Advice. Lastly, a court may request an expert to render his/her advice as to actions to be made by the court. For example, expert advice may be requested in criminal proceedings where an individual has been found guilty. The court may request for advice concerning sentencing, 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.

Under the Federal Rules of Evidence, expert testimony must meet two requirements to be admissible. First, the expert must be qualified. 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 (FRE 702). 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). Most experts derive their expertise from both of these factors, but either will suffice if it makes the witness more knowledgeable about a specialized field than a layperson (*see, U.S. v. Johnson*, 575 F.2d 1347 (5th Cir. 1978) where 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 our discussion, we will only be referring to 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.

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 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).

In addition to the above requirements, in federal courts, when the results of a scientific test or principle are sought to be introduced, the proponent must show that the test or principle is "scientifically valid" or "scientifically reliable" (*Daubert vs. Merrell Dow Pharmaceuticals, Inc.* 113 S. Ct. 2786 (1993)). The federal courts will consider the following factors, among others, in deciding whether the test or principle is "scientifically valid: whether it can be

reliably tested; whether it has been subjected to peer review and/or publication; whether it has a reasonably low error rate; whether there are professional standards controlling its operations; whether it is generally accepted within its' field; and whether it was developed for purposes other than merely to produce evidence for the present litigation (Mueller & Kirkpatrick, 1995). State courts are not required to follow *Daubert*, however, some 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 and Minnesota) (Dreyfuss, 1995). However, a few courts have flatly rejected the decision (e.g., Arizona, Florida, & Nebraska) (Dreyfuss, 1995).

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*, 463 U.S. 880, 901, 1983).

A number of courts presume that jurors appraise the credibility of experts in accordance with the expert’s domain of expertise. In *Barefoot (Id.)*, 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 (*Id.*). 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,” (*Id.*) allowing “the adversary system to sort out the reliable from the unreliable evidence and opinion about future dangerousness....”(*Id.* at 929). The Court did not subject the testimony to the *Frye* standard of “general acceptance within the relevant scientific community” (see, *Frye vs. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923) 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 (see, FED. R. EVID. 401, 402, 403).

The Supreme Court, once again, addressed expert testimony on a similar vein in *Daubert vs. Merrell Dow Pharmaceuticals, Inc.* (113 S. Ct. 2786 (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 epidemiologic 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.*, 951 F.2d 1130-31 (9th Cir. 1991). Without mentioning *Barefoot (Id.)*, 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 only 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.

The assumption that jurors are ingenious enough to recognize the limitations of “soft” but not “hard” science 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. (*See, People vs. Beckley*, 456 N.W.2d 391 (Mich. 1990) (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); *People v. McDonald*, 690 P.2d 709 (Cal. 1984) (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,” because 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 the jurors can understand and assess the evidence and merely apply the standards of relevance that govern all evidence (*see, FED. R. EVID.* 401, 402, 403). However, research on juror perceptions of expert witness credibility furnishes scarce support to these assumptions. Instead, research identifies expert’s physical characteristics and demeanor as significant influences.

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. A deficient performance in court can have far reaching implications, not only for the individual neuropsychologist’s reputation, but in addition, for the reputation and practice of psychology as a whole. A case specific court decision can establish a general principle under common-law, one court’s decision can affect the admissibility of psychological testimony in other courts.

Overview of Presentational Style and Persuasion:

There is no dearth of literature as relates to schooling experts on testifying (*for example see*, Brodsky, 1995) and equipping attorneys with strategies for cross-examination (*for example see*, Ziskin, & Faust, 1995). However, debate continues over the appropriate role of the expert witness: educator, advocate, or adviser (Saks, 1990).

The following arguments submit that experts are obligated to be persuasive advocates for their expert opinions (not advocating for a litigant):

1. One can be the leading authority in their area of specialization, however, if they are unable to clearly and convincingly communicate that expertise, then its' worth will be severely limited to the fact-finder;
2. The cross-examining attorney will endeavor to impeach credibility regardless of whether it is legitimate to do so; and
3. Ethically, experts are responsible for ensuring that their testimony (a product of their scientific and professional judgment) is not misused (Bank, 1996).

Expert witnesses are therefore obliged to become advocates for maintaining the integrity of their opinions. If neuropsychologists wish to provide accurate and useful evidence they must:

1. Develop the skills of presenting evidence in a clear and undistorted fashion;
2. Learn to counter the tactics of attorneys who might wish to frustrate this goal; and
3. With tantamount honesty, experts must admit to their deficiencies and defend their opinions against attacks.

By understanding the adversary process and courtroom communication, neuropsychological experts can help maintain the fidelity of their testimony.

In spite of the fact that the expert may be earnestly attempting to assist the court in uncovering the truth, his/her impression on the factfinders may be more an effect of factors of persuasion than from the legitimacy of his/her analyses. Indeed, the most banal testimony may be remarkably persuasive if it is vigorously presented (Naftulin, Ware, and Donnelly, 1973). On the other hand, exceptionally valid testimony may be left unheard. If participation in a trial is perceived as it actually is, a process of persuasion, then the expert witness must operate as an honest and proficient communicator by preparing for court realistically.

The process of testifying persuasively and ethically remains the same, regardless of the legal issue before the court (Bank and Poythress, 1982). The effective expert is an effective communicator. The effective expert is foremost capable of communicating his/her opinion accurately and thereby precluding testimony from being twisted from what he/she actually meant during direct examination, cross-examination, and closing arguments.

To be persuasive in the courtroom setting, a neuropsychological expert witness must be perceived by the judge and jury as being a credible source of information. Ideally, the most credible expert witness is the one that most accurately educates the factfinder. However, a number of factors extraneous to the accuracy of expert testimony significantly affect judge/jury perceptions of expert witness credibility.

The effect of extra-evidentiary factors on legal factfinders (judges/jurors) has been investigated in a number of recent studies. The majority of these studies maintain the conjectural impression of legal pundits as concerns the expert witness in court:

“The witness with the cultivated courtroom manner, rather than with the superior knowledge and greater integrity, may make the best appearance and carry the jury. The premium thus placed on personality and patter is so great that lawyers become more interested in retaining a good testifier than in retaining a good doctor” (Moenssens, 1974).

An amusing and insightful study was designed by Naftulin, Ware, and Donnelly (1973) in which the researchers employed an actor to perform as the fictitious “Dr. Fox.” A bogus, but believable vita was manufactured for “Dr. Fox” and he was then instructed in the delivery of a lecture on a subject-matter about which he knew nothing of substance. The lecture was deliberately comprised of an inordinate quantity of double-talk, neologisms, non sequiturs, and contradictory statements. The lecture was communicated in a comfortable, learned manner, enhanced with occasional humor and allusions to irrelevant topics. Despite the lack of substance communicated in the lecture, the presentational style or charisma of “Dr. Fox” was so convincing that three separate audiences of sophisticated educators, many with advanced degrees, reviewed the lecture quite favorably.

Other studies have investigated particular characteristics and mannerisms of speakers which may be related to their persuasive efficacy [*for example see*, Chaiken (1979) (concluded that physically attractive speakers have significantly superior persuasive impact on both the verbal and behavioral levels of their audiences, than do unattractive speakers.)]

Since it is language that the expert witness must use to educate, it follows that linguistic style is one of the most powerful extra-evidentiary factors toward affecting a juror’s perceptions of the expert and what he has to say.

In a study by Aune and Kikuchi (1993), a positive correlation was evident between the degree of similarity of a source’s and receiver’s use of language intensity and attributions made about the source of a message. In this study, a sample of 286 subjects, whose use of language intensity had been assessed, were asked to read a persuasive message composed with either high or low language intensity. Actual similarity between subjects’ and stimulus language intensity was positively correlated with subjects perceptions of source credibility (sociability/character, extraversion). Perceived similarity in language intensity was also positively correlated with credibility perceptions (competence, sociability/character,

composure) as well as intimacy. Both actual and perceived similarity were correlated with increased message agreement.

The Law and Language Project at Duke University has produced what may be the most comprehensive studies on language in the courtroom (see O'Barr, 1982, for a comprehensive survey of this project and its findings). Within this project, Erickson, Lind, Johnson, and O'Barr (1978) investigated variations in natural speech based on examination of courtroom testimony that had been audiotaped and transcribed. Their investigation disclosed discrete clusters of linguistic features which fluctuate in conformity with the social power and standing of the speakers. Individuals classified as low in social status and low in social power were more inclined toward the frequent use of intensifiers (e.g., *I surely did; you bet*), hedges (e.g., *It's sort of hot in here; I'd kind of like to go; I guess; It seems like*), especially formal grammar (i.e., the use of bookish grammatical forms and formal enunciation), gestures (e.g., the use of hands, and spoken expressions, such as, *over there*), questioning intonation in declarative contexts (for example, in response to the question, *When will dinner be ready? An answer like Around 6 o'clock?*, as though seeking approval and asking whether that time will be okay.), superpolite forms (e.g., *I'd really appreciate it if...; Would you please...; If you don't mind*), tag questions (e.g., *He's here, isn't he?* instead of *Is he here?*), speaking in italics (intonational emphasis equivalent to underlining words in written language; emphatic *so* or *very*; and the like), and empty adjectives (e.g., *Divine, charming, cute, sweet, adorable, lovely*).

Due to the prominence of these features in the speech of low-power witnesses, Erickson et al. (1978) labeled this speech style *powerless* speaking. Other speakers with comparatively high social power and standing in court, such as, law enforcement officers, physicians, and other professionals, utilized the above mentioned features only occasionally and expressed themselves in a more direct manner. This style was labeled *powerful* speech. To evaluate the effect of these speech styles on juror perceptions of witness credibility and attractiveness, four different experimental tapes were prepared in which either a male or a female actor reproduced the same information in either a *powerless* or *powerful* style. Subjects who either listened to the audio tapes or read a transcript rated the witnesses who spoke with the *powerless* speech style as less credible and less attractive than witnesses who spoke with the *powerful* speech style.

A number of subsequent studies have corroborated the above findings as to the effects of powerful versus powerless speech styles on source credibility (e.g., Bradac, Hemphill, & Tardy, 1981; Lind & O'Barr, 1979); while other researchers (e.g., Bradac & Mulac, 1984; Hosman, 1989) have investigated the relationship between certain of the individual components of the powerless speech style (i.e., superpolite forms, hedges, gestures, hesitations, and intensifiers). Most consistent have been the findings that hedges and hesitations negatively impact perceptions of credibility and attractiveness. The effect of intensifiers seems to depend on the presence or absence of other components of powerless speech. When intensifiers occur in conjunction with other powerless components (i.e., hedges and hesitations), they correspondingly become components of powerless speech, themselves. However, in the absence of other powerless components, intensifiers become a powerful aspect of speech style.

Language Complexity. In addition to the effects of presentational style already mentioned, an expert witness' testimony is frequently comprised of language which uses technical terminology and jargon or infrequent words and grammatical structures. Such language may be troublesome to the layperson's comprehension of the intended message and thereby affects their process of juridical decision-making (*see*, Christy, 1979; Elwork, Sales, & Alfini, 1977; Forsterlee, Horowitz, and Bourgeois, 1993).

As expressed by Meloy (1992), in the context of Rorschach testimony:

“The expert witness should be able to explain the meaning, or validity, of the Rorschach test in clear, concise, and easily understood language. When testifying before a jury, Rorschach data should be presented as though they were being taught to a high school class. When testifying before a judge, one's testimony should be designed for the college educated layperson. If Rorschach data cannot be presented at this level of language, the expert witness does not understand his validity research or cannot translate it in a way that is meaningful to the average person. To paraphrase Thomas Edison, ‘if you can't explain it to your newspaper boy, you probably don't know what you talking about’.”

Dietz, Cooke, Rapperport, and Silvergleit (1983), asked 67 judges, 78 forensic psychiatrists, and 126 forensic psychologists to complete questionnaires designed to measure the perceived value of specific technical terminology for psycholegal reports. Judges rated the degree to which specific technical terminology aids their comprehension of the issue, and clinicians were asked for ratings of the likelihood that they would use specific terminology in a report to the court. Rank-ordered ratings of 45 terms were highly correlated among the three subject groups, indicating that forensic clinicians are frequently aware of the problem of using incomprehensible psychojargon. With a few exceptions, it appeared that judges preferred terms with common meanings.

More specifically focussed in the testimonial context, subsequent to an investigation of nine civil and criminal jury trials, an American Bar Association (ABA) committee on jury comprehension discovered that the witnesses perceived as the most credible were those who communicated information comprehensibly (ABA Special Committee on Jury Comprehension, *Jury Comprehension in Complex Cases* 40,42, 1989). Highly technical and complex witnesses were not persuasive.

Likewise, another study reported that experts who delivered information in a non-technical manner and more decisive in their conclusions were more readily seen as credible than other expert witnesses (Champagne, Shuman, & Whitaker, 1991). Speaking skills and willingness to commit to firm conclusions were seen as the two most significant factors toward expert witness credibility while education, experience, pleasantness, and physical attractiveness were viewed as less crucial to perceptions of credibility. The study also revealed that the capacity to communicate technical knowledge in a non-technical manner was the principal consideration for jurors, followed by a decisiveness in making conclusions.

Paul Rosenthal, who interviewed the jurors in the first California case to use a voice spectrogram to identify a speaker (*People vs. King*, 266 Cal. Rptr. 478, 1966), discussed the effect of extra-evidentiary factors on juror perceptions of scientific credibility and juror decision-making (Rosenthal, 1983). Rosenthal examined eight members of a twelve-person jury, and concluded that as evidence becomes more complex, jurors rely on extra-evidentiary factors such as physical appearance and non-content communicative skills.

In the *Rosenthal* study, the witness considered the most scientific by the jurors was also the most specific to the facts of the case. In addition, Rosenthal found that jurors also relied on “fluidity, vocal inflexion, and appearance” to assess witness credibility. Rosenthal concluded that the jurors who understood little about the technical aspects of voice printing shifted their attention toward something what could be understood, the personal and professional attributes of the experts.

The Function of Attribution in Linguistic Complexity. An intuitive analysis of the effect of linguistic complexity on persuasion might lead one to the conclusion that the use of complex language in a counter-attitudinal appeal would cause the message to become ineffective because such language lowers comprehension thereby lowering message comprehension which is a prerequisite for persuasion (*as argued in*, Hovland, Janis, & Kelley, 1953). However, research reveals that comprehension is not a necessary prerequisite to persuasion (*e.g.*, Eagley & Chaiken, 1993) thereby controverting the above analysis.

Contemporary research on cognitive approaches to persuasion provides a different perspective to the possible effects of complex language. Specifically, guided by the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1981 1986) and the Heuristic Systematic Model (HSM) (Chaiken, 1987; Chaiken, Liberman, & Eagley, 1989), it can be maintained that complex language in a counter-attitudinal appeal may induce attitude change by influencing the kind of processing jurors engage in.

According to the ELM and the HSM, persuasion can result from two types of processes. First, persuasion can occur as a consequence of effortful processing of the arguments in the communication. When people carefully and effortfully evaluate the information relevant to the merits of the advocated position, they are said to be following the “central route” processing in the ELM and performing “systematic” processing in the HSM. Second, in contrast to the careful and effortful processing of the “central route/systematic processing,” persuasion can also occur as a result of attention to some other message irrelevant cue. Examples of these cues are the education, experience, physical attractiveness, charisma, or popularity of the persuasive source, source expertise, and message length (*e.g.*, Chaiken, 1979; Naftulin, Ware, & Donnelly 1973). The HSM emphasizes heuristics as mediating factors in cue-based persuasion (*e.g.*, “I can believe what educated people say”), therefore, referring to this type of processing as “heuristic”. The ELM attempts to explain all processes not depending on evidential scrutiny: heuristics, classical conditioning, operant conditioning, etc. The ELM’s term for this expansive class of mechanisms is “peripheral route” processing. Although the ELM and the HSM differ in their scope of persuasion explanation, they both hypothesize that persuasion can be the result of corresponding processes. These processes are the cognitive elaboration of the arguments in the message and the utilization of less cognitively effortful strategies such as the application of

extraneous cues to message validity (in the legal context, these can be extra-evidentiary factors)(*see*, Eagly & Chaiken, 1993; Petty, 1994). In general, these processing modes are correspondingly labeled “central route” and “peripheral route” processing. Cues that are extraneous to argument content, that however affect perceived message credibility, are termed “peripheral cues”.

The probability that argument scrutiny and elaboration will occur, to wit, the probability that persuasion will proceed via central route processing, is a function of both an individual’s motivation and ability to scrutinize the arguments included in the message. As motivation and ability increase, so does the probability that the arguments will be scrutinized and elaborated. In other words, central route processing will occur. Where central route processing occurs, persuasive effect will be a function of argument quality or strength. This is so, for the reason that argument quality presumably determines whether pro or anti-message thoughts predominate. As motivation and/or ability for argument scrutiny and elaboration decreases, persuasion becomes more a function of peripheral route processing. Under such circumstances, persuasion would depend more on the non/existence of peripheral cues, as well as, the strength of peripheral cues. Several investigations buttress the preceding propositions (*see for example*, Eagly & Chaiken, 1993; Petty & Cacioppo, 1986).

Language complexity in a counter-attitudinal appeal can also be understood as a function of a message receiver’s motivation and capacity to scrutinize and elaborate on message arguments. If a counter-attitudinal message is plainly and simply worded and, therefore easily comprehensible, recipients should scrutinize and elaborate on argument content. Therefore, message agreement should be a function of argument quality. Conversely, the use of technical jargon, rarely used words, and intricate grammatical structures should reduce an individual’s capacity to scrutinize the arguments in the message, thereby heightening their proclivity toward relying on peripheral cues to argument validity rather than on argument quality.

There is some evidence that arguments which are difficult to comprehend magnify the recipient’s proclivity toward relying on peripheral cues to argument validity. In two studies, Ratneswar and Chaiken (1991) investigated the effects of message comprehensibility and source expertise (a peripheral cue). In these studies, subjects were required to read a message promoting a new product. Comprehensibility was varied by length of message exposure time and amount of past knowledge about the product. In both studies, message exposure was followed by a measure of subjects’ attitudes toward the product and a measure of the thoughts the subjects demonstrated while reading the message. In both studies, when the message comprehensibility was low, subjects attitudes toward the product were more approving when the source was an expert than when the source was a novice. When the message comprehensibility was high, source expertise had no measurable effect on subjects’ attitudes.

In another study (Hafer, Reynolds, & Obertynski, 1996), the effect of complex language in counter-attitudinal appeals to laypeople were investigated within the framework of the ELM and HSM theories of persuasion. One hundred and four undergraduates listened to a counter-attitudinal speech that varied in argument strength, wording

complexity/comprehension, and source status. Subjects were then asked to respond to an attitude survey, a thought listing task, and to recall the arguments that were presented. When arguments were easy to comprehend, attitudes were more favorable than when the arguments were difficult to comprehend. When arguments were difficult to comprehend, attitudes were more favorable when the source was of high versus low status. Further analyses indicated cognitive elaboration influenced persuasion when comprehension was easy, however, cognitive elaboration in addition to less effortful peripheral/heuristic processing influenced persuasion when comprehension was difficult.

In another study, participants, serving as mock jurors, viewed a videotaped trial in which two scientific expert witnesses provided testimony on the possibility of a plaintiff's illness from PCBs (Cooper, Bennett, & Sukel, 1996). The complexity of the experts testimony and the strength of the experts credentials were varied in a 2 x 2 factorial design. After watching the videotape, mock jurors rendered a verdict and answered a number of attitude surveys related to the trial. The expert whose scientific testimony was complex was more likely to be believed when his credentials were impressive. Relative to an expert from a less prestigious institution with the same number of publications to his credit, the expert with impressive credentials was more convincing. The expert with more modest credentials presented precisely the same case, made the same arguments based on the same data. Like the expert with high credentials, the expert with modest credentials had a Ph.D., taught at a college, and published original research. Nonetheless, when the testimony was complex, mock jurors used the degree of the expert's credentials as the basis for their judgments. However, when the evidence was presented in more comprehensible language, the advantage of having impressive credentials disappeared. There was no significant difference in the verdict, confidence, or probability as a function of the experts credentials when the testimony was easy to understand.

In summary, these studies support the notion that language complexity and, therefore, message comprehensibility, influences the extent to which individuals rely on peripheral cues in assessing the validity of a message. In addition, these studies address how message comprehensibility mediates the influence of arguments on persuasion.

Due to the difficulties inherent in valid and reliable neuropsychological assessment of mild traumatic brain injury, it is one of the most frequently litigated and tried issues within the forensic neuropsychological arena. The neuropsychological assessment and subsequent testimony used to explain mild traumatic brain injury to the legal fact-finder is relatively technical and complex functional evidence. However, neuropsychological testimony of mild traumatic brain injury continues to be recognized as a powerful explanatory tool of persuasion by attorneys. This leads to a possible picture of divergence between research and current utilization of expert testimony in mild traumatic brain injury cases. In addition to the enormity of the costs to society and the individual of mild traumatic brain injury, the consequent litigation make it an important area on which to apply the preceding research. In the next section, the neuropsychology of traumatic brain injury, and more specifically mild traumatic brain injury, will be examined.

Neuropsychology of Mild Traumatic Brain Injury:

Approximately, 1,000,000 people and growing are hospitalized with traumatic brain injuries (TBIs) in the United States each year (Center for Disease Control, 1999). Of these, 80,000 people continue life with lingering physical, emotional and/or cognitive disabilities (Center for Disease Control, 1999). These disabilities frequently disallow those suffering from them from resuming their pre-injury life. 5.3 million Americans are living today with disability as a result of a TBI for which they were hospitalized (Center for Disease Control, 1999). A half to three-quarters of those who suffer a TBI sustain what is commonly labeled a “mild” or “minor” TBI, on the basis of numerous indices; including Glasgow Coma Scale rating, amount of time unconscious, and/or the clinical presentation at the time of initial evaluation (Center for Disease Control, 1999). Approximately four out of five patients who sustain a mild TBI receive only out-patient treatment, or no treatment at all (Center for Disease Control, 1999). Adolescents and young adults (ages 15 to 25) make up the highest risk group for TBI with males being significantly more prone than females (Center for Disease Control, 1999). TBI is the leading cause of death and injury-related disability among children and young adults (Center for Disease Control, 1999). The significance of TBI in young people is underscored by the fact that 150,000 to 200,000 school-aged or younger children are hospitalized each year in the United States with head injury (Center for Disease Control, 1999). Of those 15,000 to 20,000 require extended hospitalization (Eiben, Anderson, Lockman, Matthews, Dryja, Martin, Gottesman, O’Brian, & White, 1984). Adolescents age 19 and younger sustain over 30 percent of all head injuries (Gross, Wolf, Kunitz, & Jane, 1985). Traumatic brain injuries in the U.S. cost more than \$25 billion annually (Center for Disease Control, 1999).

Traumatic brain injuries can follow either open or closed head trauma. Open head injuries are those in which the skull has been breached. Most commonly these are a result of missiles, such as bullets, and are less common in peace time than are closed head injuries. Closed head injuries are those in which the skull has not been breached, typically resulting from the rapid acceleration/deceleration of the head (Levin, Benton, & Grossman, 1982). Most frequently they are the result of motor vehicle accidents, but also occur as the result of bicycle accidents, falls, sports accidents, assault, and, in the case in young children, abuse (Center for Disease Control, 1999). Due to the usual severity of open head injuries, mild TBI is almost exclusively associated with closed head injury.

Brain lesions result in a broad scope of consequent neurobehavioral symptoms. Primary impact damage (injuries directly related and immediate to the damaging forces) can be comprised of surface lacerations and contusions. These can penetrate to anywhere in the brain, but most frequently occur in brain areas that are adjacent to rough and or protruding interior surfaces of the skull (e.g., the temporal and frontal lobes) (Levin, Goldstein, Williams, & Eisenberg, 1991). Primary damage can also include diffuse axonal or multifocal shearing lesions. This is damage of stretching or tearing caused by rapid rotational inertial forces. In addition, primary damage can include diffuse heterogenous tearing of neural tissue caused by cavitation within the brain, and focal penetration of brain tissue associated with depressed skull fracture (Bigler, 1987). Secondary brain damage (injuries indirectly related to the damaging forces and following as an effect of primary damage) may result from intracranial bleeding, swelling/edema and associated increases in

intracranial pressure, and hypoxic ischemia (cell death due to lack of oxygen) (Bigler, 1987).

There is great variety among individuals with TBI. This variety is grounded in the nature and severity of brain damage; pre-injury attributes including age, intellectual capacity, educational and vocational achievement, and personality; and post-injury care, family support, social support, and emotional and behavioral response (Ylvisaker, Kolpan, & Rosenthal, 1994). In personal injury suits pre-injury characteristics are regularly accentuated because of the idiographic nature of TBI. An inordinate abundance of adult TBI patients have a pre-trauma history of substance abuse and academic or vocational failure (Ylvisaker, Kolpan, & Rosenthal, 1994). In addition, an inordinate amount of children with TBI have a history of learning or behavioral problems (Ylvisaker, Kolpan, & Rosenthal, 1994). Attorneys for the defendant frequently utilize the absence of established pre-baseline information regarding these epidemiological facts to support their position that the plaintiff's deficits pre-existed the injury. This is done especially in the ambiguous case of mild traumatic brain injury.

The long-term prognosis is generally bright for a preponderance of those afflicted with a mild TBI, however, it has been well documented that there can be significant short-term behavioral, somatic, and cognitive sequelae (Silver & McAllister, 1997). Moreover, a significant minority of mild TBI patients advance into a more chronic and frequently incapacitating pattern of symptomology that can be troublesome to both evaluate and treat (Silver & McAllister, 1997). It is noteworthy to particularize some of the reasons for the confusion about the evaluation and treatment of mild TBI.

First, there is no completely recognized definition of mild brain injury. Clinical standards, including the length of unconsciousness and the duration of post-traumatic amnesia, are frequently employed for characterizing TBI severity. According to these standards, loss of consciousness (LOC) of less than 20 to 30 minutes and a period of posttraumatic amnesia of less than 24 hours are customarily indicative of a mild TBI (McAllister, 1994). Frequently utilized by emergency medical services, emergency departments, and trauma centers to diagnose TBI is the Glasgow Coma Scale (GCS). The GCS is an uncomplicated screening tool that evaluates a patient's best motor, oculomotor, and verbal responses on a 15 points scale. Scores of 13 to 15 are consistently indicative of a mild TBI. During initial evaluation, these patients often present as partially dazed, confused and detached. Confusion also emanates out of a paucity in accuracy of related terminology (e.g., concussion, post-concussive syndrome, minor head injury).

TBI presents itself along a continuum of severity. Whether mild, moderate, or severe, TBI follows a predictable profile of injury to the brain and clinical deficits in areas of sensorimotor function, cognition and behavior (Bohnen, Twijnstra, & Jolles, 1992). These injuries and deficits have an expected process of development and recovery. In mild TBI, determined by the most frequently employed standard (LOC, duration of posttraumatic amnesia and GCS score), the magnitude of damage is less than that seen in more severely injured patients. As would be expected, mild TBI patients have a better prognosis for recovery. The symptomology observed in a preponderance of patients after a mild TBI, demonstrate ongoing restoration of normal functioning during the ensuing one to three

months. In a small proportion of patients, deficits will remain twelve months or more after the injury (Silver & McAllister, 1997).

Even as there is disagreement about definitions and the etiology of long-term deficits of mild TBI, there is extensive coherence in the assertion that detriments subsequent to mild TBI present in somatic, cognitive, and emotional/psychological domains. Numerous studies indicate that a substantial majority of mild TBI patients have transitory deficits, lasting one week to one month. However, these studies have found a significant minority of mild TBI patients that suffer more enduring deficits, lasting months to a year or more after the injury (*see e.g.*, Bohnen, Twijnstra, & Jolles, 1992).

Nearly all investigations of cognitive functioning following mild TBI indicate that patients most commonly report and coincidentally exhibit difficulties with attention, concentration, memory, and speed of information processing (*see e.g.*, Bohnen, Twijnstra, & Jolles, 1992). Numerous studies have reported that mild TBI patients tolerate an elevated incidence of physical complaints, including dizziness, fatigue, headache, sleep disturbance, and light and noise sensitivity (*see e.g.*, Bohnen, Twijnstra, & Jolles, 1992).

Behaviorally, the most frequent complaints include anxiety, irritability, and depression (*see e.g.*, Bohnen, Twijnstra, & Jolles, 1992). Available data, both human and animal, suggest that mild TBI results in neuropathological changes that are less extensive than, but similar in quality and location to those seen in more severe brain injury.

Due to the inherent life-threatening nature of many of the various causes of traumatic brain injury, including motor vehicle accidents and assaults, there is an increased incidence of post-traumatic stress disorder (PTSD) (Ohry, Rattok, & Solomon, 1996). The typical symptomology of PTSD includes re-experiencing the traumatic event, social withdrawal, and autonomic hyperactivity (Ohry, et al, 1996).

Unfortunately, a favorable recuperation is not universal. A considerable number of patients continue to report and exhibit persistent difficulties 6 to 12 months and even longer after their injury (*see e.g.*, Bohnen, Twijnstra, & Jolles, 1992).

Several factors have been indicated as affecting the process and consequence of symptoms following traumatic brain injury. Although the available figures are principally from moderate and severe TBI patients, morbidity and mortality appear to be higher in the elderly population; and alcohol consumption appears to be a serious risk factor for TBI and has a negative effect on outcome (Silver & McAllister, 1997). Previous brain injury appears to also negatively affect outcome in areas of the patients life, such as, returning to work and severity of cognitive disability in the mild TBI population (Silver & McAllister, 1997). As previously suggested, the existence of depressed skull fractures, focal intracranial lesions, and significant extracranial injury have been specifically associated with below average recovery in mild TBI patients (Bigler, 1987).

Structural brain imaging studies frequently do not evidence significant abnormalities in mild TBI patients. Brain imaging techniques are most commonly used to establish the focus and magnitude of brain lesions. These approaches are frequently of great value in moderate to

severe TBI patients. Computed tomography (CT) is currently widely available and is often utilized in the documentation of structural brain injury caused by contusions, lacerations (more frequently in open-head trauma) and hematomas. The period during which imaging is conducted is of great import due to changes in neural lesions over time. Lesions may be discernible via imaging months after the injury that would not be visible during the acute phase (Cope, Date, & Mar, 1988). A significant number of severe TBI patients initially exhibit no lesions on CT scans that are detectable if CT scans are performed one and three months post-injury (Cope, Date, & Mar, 1988). Magnetic resonance imaging (MRI) has also demonstrated brain lesions in patients with severe TBI when CT scans have not displayed brain lesions (Levin, Amparo, & Eisenberg, 1987). MRI is particularly sensitive in detecting fronto-temporal lesions that are not discernible by CT. It is frequently these MRI detectable (CT undetectable) lesions which are the related loci to the neuropsychological outcome of the injury (Levin, Amparo, & Eisenberg, 1987). As regards mild TBI, MRI has occasionally been able to evidence diffuse axonal injury in patients who display a normal CT scan (Mittl, Grossman, Hiehle, et al, 1994). However, it is substantially more frequent for MRI and CT scans to exhibit no neural irregularities in patients with mild traumatic brain injury (Mittl, Grossman, Hiehle, et al, 1994).

It is frequently requested of the neuropsychological examiner to ascertain whether a current clinical condition is related to a specific incident. There are myriad components to the “current condition” which may be connected to brain injury, emotional or psychological reactions, or to social, occupational, or legal consequences of the incident. Persistent neurobehavioral symptomology is most commonly connected to multiple factors, including but not limited to brain injury, psychological/emotional conditions, chronic pain, and secondary gain. When the patient complains of cognitive difficulties due to a mild brain injury, the gravity of these symptoms may seem distorted as to the extent of the injury (Silver & McAllister, 1997). Patients’ difficulties may not be simply or precisely diagnosed as either functional or neurological. In actuality, the majority of symptoms appear as an interaction of various factors.

Patients who are referred for a forensic neuropsychological evaluation are, definitionally, involved in compensation or litigation. Ordinarily, such involvement does not seem to influence the process of recuperation following mild brain injury. The majority of all patients are able to proceed back to their pre-injury employment notwithstanding the persistence of neurobehavioral symptoms (Hugenholtz, Stuss, Stethem, et al, 1988). Nevertheless, in a study (Binder & Rohling, 1996), a meta-analysis was performed, accounting for a total of 1,277 subjects where there was data concerning the presence of head injury and potential pecuniary incentives. It was determined that neurobehavioral symptoms could be decreased by 22 percent if financial incentives were eliminated, particularly in the case of mild TBI.

Specific factors that increase the suspicion of malingering include: the litigation context, a marked discrepancy between clinical findings and subjective complaints, lack of cooperation with evaluation and treatment, antisocial personality traits or disorder, over-dramatization of complaints, a history of recurrent accidents or injuries, evidence of self induced injuries, vaguely defined symptoms, a poor work history, and the inability to work while retaining the capacity for pleasurable activities (Simon, 1994). However, many of these commonly

occur in those who has suffered brain injury. Many individuals with brain injury are or have been involved in some form of litigation. Preexisting antisocial traits may be present, and in fact may have been a factor in causing the injury. Many individuals with brain injuries have had prior injuries or concussions. A large portion of victims of brain injury are suspicious of forensic neuropsychological evaluations and view them as part of a process to deny benefits or needed treatment. Therefore, the presence of “suspicious” factors does not inevitably point to malingering.

Conclusion:

Due to the apparent discrepancy between the “mild” nature of mild traumatic brain injuries and their numerous symptoms and functional impairments, the issue frequently becomes a matter of dispute and litigation. Neuropsychological evaluations and expert witness testimony are frequently used in both criminal and civil cases to persuade judges and jurors of the veracity of a parties contention of existence/nonexistence of neurobehavioral dysfunction and in some cases its etiology. These evaluations and resulting testimony tend to be viewed as highly complex and technical, as they are based on functionality of the patient.

In other words, neuropsychological evaluations and testimony, especially in the case of mild traumatic brain injury, are circumstantial evidence of brain injury, requiring the factfinder to make inferences to reach a verdict.

The decision-making process that encompasses these inferences are especially prone to extra-evidentiary factors such as language complexity and source characteristics. Although research points to the probability that weak circumstantial evidence will lessen the effect of language complexity on juror perceptions of credibility while increasing the effect of source characteristics or other peripheral cues on juror perceptions of credibility, attorneys continue to effectively utilize these experts as explanatory tools of persuasion even in the most evidentiary ambiguous case such as mild traumatic brain injury.

This utilization is probably well based on practical skills as an attorney. It is supported by research, that jurors utilize both comprehension and peripheral cues such as source characteristics in their perceptions of expert witness credibility. Although neuropsychological evaluation and testimony surrounding mild traumatic brain injury is technical and complex, when language is comprehensible by jurors (lay language), jurors assessments of the expert’s credibility increase, as the effects of source characteristics (source status in this case) decrease.

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