

Trends of Adult and Pediatric Neuropsychology in the United States Legal System

Melissa LaVan

A Dissertation Submitted to the Faculty of
The Chicago School of Professional Psychology
In Partial Fulfillment of the Requirements
For the Degree of Doctor of Psychology

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2017

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Abstract

Clinical neuropsychologists are becoming more involved in the United States legal system at exponential rates (Kaufmann, 2009; Sweet & Giuffre Meyer, 2012; Taylor, 1999). However, there is minimal current data on the specific rates of neuropsychology involvement in the court system, and there is a scarcity of data regarding the use of pediatric neuropsychology. This study attempted to address the existing paucity of data by examining the involvement of neuropsychology as a field in the US court system. It also investigated how often the pediatric domain was involved. This was achieved by reporting the frequency of cases by year, from 1945 to May 2015 of the results of a LexisNexis search for key neuropsychological terms. Additionally, these cases were examined for pediatric themes. It was expected that the use of adult and pediatric neuropsychology would show growth over the years and, indeed, both have shown exponential growth. Additionally, the majority of these cases, for both adults and children, were civil rather than criminal in nature. They were also heard more in federal courts than in state courts. Social Security was mentioned often in adult cases, whereas the pediatric cases were related to school issues. Furthermore, the content of each case from 2014 was reviewed to investigate the capacity in which the domain of neuropsychology was used in legal settings. The content analysis revealed that neuropsychology was most often included in an assessment capacity, but also in testimony, reports, as consultants, or as treating professionals. There was overlap between these categories, indicating that neuropsychology may serve multiple roles when it is called for in a case. The results of this review could inform forensic training practices for both adult and pediatric neuropsychology.

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Chapter 1: Nature of the Study

Introduction

Over the past few decades, the interest in the intersection of neuropsychology and forensics has shown tremendous growth (Kaufmann, 2009; Sweet & Giuffre Meyer, 2012; Sweet, King, Malina, Bergman, & Simmons, 2002; Sweet & Westerveld, 2012; Taylor, 1999). In the United States legal proceedings, the frequency of cases that reference neuropsychological terms has increased each decade. Additionally, academic inquiry into forensic topics by neuropsychologists has also increased between 1990 and 2000 (Sweet et al., 2002). Although there are multiple ways neuropsychology can be included in forensics, such as through assessment, expert testimony, or presentation of neuropsychological research, there is minimal data depicting how neuropsychology was used in legal proceedings. As such, the current study was designed to explore the year-by-year growth of the use of neuropsychology in the US legal system while identifying main topics that are referenced in these cases.

Additionally, pediatric neuropsychology has only recently has been formally recognized as a subspecialty by professional boards of psychology in the United States (Lucas, Mahone, Westerveld, Bieliauskas, & Baron, 2014). It has not been specifically addressed in previous research about the relationship between neuropsychology and the US legal system. Given that, the current study adds to the existing body of literature by exploring the year-by-year frequencies of the use of neuropsychology with the pediatric population in US court cases.

Psychology in the Legal System

The field that involves the use of psychological knowledge and expertise in the legal system is called forensic psychology (Weiner & Otto, 2013). Within the realm of forensic psychology, psychologists may be asked to use their expertise in order to assist the legal system

in a variety of ways. This includes, but is not limited to, offering services to persons involved with the legal system, assisting the courts in decision making, and collecting and disseminating psychological research that is relevant to legal matters. Some broadly place these functions into three categories: advisors, evaluators, and reformers (Costanzo & Krauss, 2010). As advisors, psychologists are asked to use their expertise to assist with particular aspects of cases. As evaluators, psychologists work as program evaluators to assess the efficacy of legal curriculum or interventions (e.g., prison deterrents). Finally, as reformers, psychologists disseminate their research to the various parts of the legal system. Psychologists can fulfill these functions in a variety of ways: through expert testimony, cross-disciplinary training (between psychology and law), Amicus Curiae Briefs (documents filed to assist directly in a legal proceeding), publication in academic journals, and influencing public policy.

Neuropsychology

Neuropsychology is the scientific study of the relationship between the brain and behavior (Horton & Wedding, 2008). Practitioners in the field understand that neuropsychological performance can be affected by many different variables. Clinical neuropsychology uses the knowledge of brain-behavior relationships to understand normal and abnormal brain development and how damage to the brain can affect cognitive, emotional, and behavioral function (Bodin, Roper, O'Toole, & Haines, 2015). Neuropsychologists can then apply this understanding to the assessment, diagnosis, treatment, and rehabilitations of patients with issues stemming from neurological, medical, psychological, and learning disorders.

Clinical neuropsychologists who work with adults are licensed psychologists who have received training in both clinical psychology and neuropsychology (American Academy of Clinical Neuropsychology, 2016a). These professionals utilize a variety of tools to evaluate a

patient's strengths and weaknesses and plan interventions. Pediatric neuropsychologists are also licensed psychologists who have received training in both clinical psychology and neuropsychology (American Academy of Clinical Neuropsychology, 2016b). In order to help them serve the pediatric population, they have special training in the development of the brain. With this training, pediatric neuropsychologists help parents, teachers, and children to understand how problems with the brain affect children's behaviors at school, home, or elsewhere.

Training in the neuropsychology and pediatric neuropsychology specialties typically begin with the completion of a doctoral degree in psychology and an internship in a clinically relevant area of psychology (American Academy of Clinical Neuropsychology, 2016a). Practitioners are required to have at least two years of additional specialized neuropsychology training and they must be licensed in the state in which they wish to practice. Although board certification is not a strict requirement for clinical neuropsychologists, it does provide evidence of competency in the field because board-certification requires four rigorous stages of peer review (American Board of Professional Psychology, 2016a). The process involves a committee reviewing how the applicants acquired their neuropsychological knowledge (American Board of Professional Psychology, 2016b). The board looks for the existence of didactic experiences in basic neurosciences, functional neuroanatomy, neuropathology, clinical neurology, psychological assessment, clinical neuropsychological assessment, psychopathology, and psychological intervention. They also evaluate where post-doctoral training occurred. To achieve board certification in pediatric neuropsychology, neuropsychologists must have the qualifications of a board-certified clinical neuropsychologist as well as additional training in pediatric concerns (American Board of Professional Psychology, 2014).

Previous Research of the Use of Forensic Neuropsychology

There have been two approaches to determine the prevalence of the use of neuropsychology in the forensic setting: examining the trends in research and examining the trends in legal proceedings. Heilbronner (2004) suggested that one of the best ways to measure the growth of a particular field is through the dissemination of research in the area. An increase in research indicates an increase in the interest in the field. Sweet et al. (2002) used this idea to provide evidence that demonstrated the growth of the field. He and his colleagues examined the contents of the three most popular clinical neuropsychology journals from 1990 to 2000: *Archives of Clinical Neuropsychology*, *Journal of Clinical and Experimental Neuropsychology*, and *The Clinical Neuropsychologist*. Their goal was to compare the relative proportions of articles directly related to forensic neuropsychology as compared to other topics. In 1990, only 4% of the articles published in these journals were either partially or substantially forensic in nature. That percentage increased to 14% in 2000, suggesting that these topics were gaining interest among clinical neuropsychologists.

Sweet et al. (2002) also identified the specific topics covered within these published articles about forensic neuropsychology. They reported that the most frequently covered topic was malingering (86%), followed by measures of cognitive abilities (82%), and decision making (58%). Additionally, they noted that there were a greater proportion of articles related to civil versus criminal proceedings.

The other method that demonstrated the increase of the use of neuropsychology in forensics was examining the content of court cases (Sweet & Giuffre Meyer, 2012). There are electronic databases [such as LexisNexis (LexisNexis, 2015a)] that contain historical documentation of legal proceedings in the US. Taylor (1999) utilized these databases to examine

the frequency of cases that mention the word “neuropsychologist.” He discovered that, prior to April 1997, only 401 state and federal cases mentioned this term. He noted that a majority of these cases was from appellate courts and about 70% were civil actions. The first reported case with the term, neuropsychologist, was in 1954. However, 98% of these cases were between 1980 and 1997, leading Taylor to conclude that neuropsychologists have, only recently, become important expert witnesses.

Using these results, Taylor (1999) provided some possible contributing factors as to why neuropsychologists recently emerged as litigation experts. The first factor is that medical advancements have led to an increasing number of people who survive brain injuries. The survivors, therefore, utilize neuropsychologists to assist them in personal injury lawsuits. The second factor was the creation of traumatic brain injury (TBI) advocacy groups. These organizations are composed of survivors, attorneys, and health care providers who seek to inform the public about the usefulness of presenting neuropsychological evidence in legal proceedings. Another factor that Taylor attributed to the recent increase of neuropsychologists in court cases was the greater availability of trained professionals to provide their expertise. Finally, he postulated that the positive response to neuropsychological evidence by the legal system has encouraged more attorneys to seek their expertise and promote legislation that allows it.

More recently, Kaufmann (2009) conducted a search in LexisNexis (LexisNexis, 2015a). This differed from Taylor’s (1999) search strategy by using the root “neuropsycholo-” instead of the full term neuropsychologist. There was a total of 4,358 cases that were revealed using this search strategy. Kaufmann (2009) noted that, in this sample, 71% of the cases occurred in the previous decade. Interestingly, Kaufmann compared this growth to similar areas of expertise, such as forensic psychology, forensic psychiatry, and neuropsychiatry. He noted that referencing

neuropsychology in court cases has overtaken these other specialties and remarked that this growth was accelerating.

Jerry Sweet and his colleagues have been the most recent to investigate the growing trend of the use of neuropsychology in the legal system (Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012). They, too, expanded on Taylor's (1999) methods. They noted that Taylor's (1999) search term of neuropsychologist was not sufficient in addressing the field of neuropsychology in general. It only accounted for when a neuropsychologist was referenced. In order to improve on this, Sweet and colleagues (Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012) also conducted LexisNexis database searches, but in addition to searching for the term neuropsychologist, they also used the search terms, "neuropsychological," or "neuropsychology." They reported their results by decade. In the 1980s, 222 cases mentioned one of these terms. In the 1990s, there were 1130 cases and between 2000 and June 2010, 3,786 cases were identified using one of these terms. The researchers concluded that the involvement of neuropsychology in US court proceedings has increased dramatically.

Sweet and Giuffre Meyer (2012) also used LexisNexis Academic (LexisNexis, 2015a) to conduct this same search, neuropsychologist, neuropsychological, or neuropsychology, to explore its archive of legal materials that are primarily for, and written by, attorneys. They reported their results by decade. In the 1980s, 18 publications mentioned one of these terms. In the 1990s, there were 193 and between 2000 and June 2010, 559 publications were identified using one of these terms. Just as with the case documents, there was rapid growth in this area as well. Sweet and Giuffre Meyer (2012) asserted that this curvilinear growth in the use of neuropsychology in the legal system cannot continue in this manner and, probably in the next 10 to 20 years, will reach a stable level of growth.

Problem Statement and Statement of Purpose

The previous research about the use of neuropsychology in the forensic setting revealed that this area has been growing considerably (Kaufmann, 2009; Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012; Taylor, 1999). Separate lines of research have provided information about the forensic topics in which neuropsychologists are academically interested (Sweet et al., 2002). However, these two directions of inquiry have not revealed which topics of neuropsychology actually occur in court proceedings.

Therefore, the purpose of this research project was to investigate the growing trend of the use of neuropsychologists in forensic settings by updating previous research data (i.e., Kaufmann, 2009; Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012; Taylor, 1999), which included cases through 2010. The present study includes cases through May 2015. In addition, the previous research did not specifically investigate the trends of the use of pediatric neuropsychology in forensic practice. However, cases involving children can be different from those involving adults. Therefore, in the current study, the pediatric and adult cases were considered separately.

Research Questions

1. What were the annual frequencies of cases in the US that utilize the profession of neuropsychology in any capacity from the 1950s to May 2015?
2. What were the trends of how neuropsychology (e.g., witness, consultant, assessment) was used in US court cases in the most recent full year of data (2014)?
3. What were the annual frequencies of cases in the US that utilize the profession of pediatric neuropsychology in any capacity from the 1950s to May 2015?

Hypotheses

1. Based on the reported trends from previous research, it was expected that the use of the profession of neuropsychology would increase with each year.
2. Because of a lack of previous data in this area, a hypothesis was not formed to describe how neuropsychology was used (e.g., witness, consultant, assessment) in the forensic setting in 2014.
3. Although previous data did not exist regarding the use of pediatric neuropsychology in forensics, based on the previously reported trends of the use of general neuropsychology, it was expected that the use of pediatric neuropsychology would also increase with each year.

Usefulness

Previous research has demonstrated that neuropsychology is being utilized more in the US legal system. The data presented in this research hope to confirm that the growth is still continuing. Additionally, the data include pediatric cases, providing an indication of how often pediatric specialists might become involved. Currently, there are no specific requirements to receive legal training in order to participate in forensic activities. However, if the growth of the use of neuropsychology continues as it has previously, then it would be likely that neuropsychologists will be asked to provide their expertise at some point in their career. Therefore, depending on the results of this study, it may be prudent to recommend that basic legal training be incorporated into the curriculum of psychology programs.

By looking at the content of these identified cases, the field may gain a better understanding of the involvement of neuropsychology in the legal system. It might be able to reveal if the focus of neuropsychology in these cases is broad or narrow. If there are specific

areas of neuropsychology that are mentioned more frequently, then the research might be able to inform neuropsychologists who wish to practice in forensics where to concentrate their training. For example, if TBIs were involved in most cases, then future forensic neuropsychologists would want to make sure that their training included a focus on TBIs.

Chapter 2: Literature Review

The Legal System in the US

In the United States, the legal system involves an adversarial system of justice (Wrightsmann, Greene, Nietzel, & Fortune, 2002). An adversarial system is a system that allows parties involved in a dispute to present evidence to a neutral third party. This third party will then decide the outcome of the dispute based on the evidence and arguments presented by the parties and considering any relevant precedents. In the US, the court system operates under the doctrine of *stare decisis*, which dictates that when a court makes a litigation decision, it creates a precedent for how to decide all future cases involving the same facts (American Bar Association, 2016).

The legal system in the US has a hierarchical structure with the US Supreme Court at the top (Costanzo & Krauss, 2010; US Department of State, 2004). The role of the US Supreme Court is to act as a policy maker by interpreting decisions of lower court cases. Public policy issues arrive at the Supreme Court in the form of legal disputes that must be resolved. The nine Supreme Court Justices review a small number of cases annually based on the potential implications the result would have on American society. Their judgment on these cases is the final word on the law in the US.

Below the US Supreme Court, there are two branches of court systems: state and federal (Costanzo & Krauss, 2010; US Department of State, 2004). Each branch of government has its own set of courts. State courts handle the issues related to local and state laws and federal courts hear cases that fall under federal, rather than state, jurisdiction.

The US court system also allows for parties to ask for a second opinion on the results of their cases (Costanzo & Krauss, 2010). In both state and federal courts, there is a three-level

hierarchy of courts. Trial courts are where cases start. If there is a legal basis for an appeal, one party can ask a higher-level court to review the decision of the trial court. The appellate courts can confirm the decision of the lower court or determine that the case be retired at the lower court. The highest courts in the hierarchy are the courts of last resort. These courts hear any final appeals and make a final decision on the cases that they hear. The US Supreme Court is an example of a court of last resort.

In the US, cases heard in the state and federal courts are classified into two different systems of law – civil and criminal (Costanzo & Krauss, 2010; US Department of State, 2004). Most of the cases in the US are civil proceedings. Civil cases involve a conflict between persons or institutions. One party seeks monetary compensation, or something else, from the other party. Examples of civil cases include consumer problems, arguments between neighbors, family problems, such as divorce, child custody, and child support. The other category of cases is criminal proceedings. Criminal courts involve situations where someone has broken a law or committed a crime against society. Therefore, the state or federal government is always a party in criminal cases. The burden of proof to demonstrate guilt in criminal cases is higher than in civil cases because the penalty for guilty parties in criminal cases has the potential to be greater. In civil cases, the burden of proof needs to show that guilt is “more likely than not,” whereas in criminal cases, guilt must be proven “beyond a reasonable doubt.”

Parties Involved in the Court System

There are many different types of parties involved in the court system during a trial, including judges, juries, lawyers, plaintiffs, defendants, and witnesses (Wrightsmann et al., 2002). Civil cases begin with a person or organization filing a complaint with the court against another person or organization. The party filing the complaint is called the plaintiff. The party whom the

complaint is against is called the defendant. Sometimes, such as in domestic disputes, the person filing the complaint is called the petitioner and the person whom the complaint is against is called the respondent. In criminal cases, the defendant is the person accused of committing a crime. In the appellate courts, the party that wants to appeal the decision of the lower court is called the appellant or petitioner. The other party is the appellee or the respondent.

The judge is in charge of the courtroom (American Bar Association, 2014). If there is a jury, then the judge delivers instructions to the jury and provides information about the law that pertains to the case. The jury will then determine the verdict of the case based on the evidence presented in court. If there is no jury, then the judge will decide the verdict.

Juries are chosen from a pool of eligible citizens (American Bar Association, 2014). Depending on the type of case, juries consist of either six or twelve members who have been interviewed by the judge, as well as the lawyers of both sides of the dispute. They do this to ensure that the juror has no prior knowledge of the case or previous experiences that would cause them to hear the evidence with prejudice. Once the lawyers agree upon a jury, the jurors are instructed to listen to the evidence and to not draw premature conclusions. Jurors generally do not have the right to directly ask the witnesses any questions. In the past, juries had to unanimously decide the verdict. However, some courts have begun to decide verdicts based on two-thirds or three-fifths majorities of the jurors.

Lawyers for both sides of a dispute are also officers of the court (American Bar Association, 2014; US Department of State, 2004). Lawyers follow a professional code of conduct and act on behalf of the best interest of their clients by presenting evidence to support their clients' claims. The evidence consists of physical evidence and the testimony of witnesses.

Lawyers also have the opportunity to cross-examine, or ask questions of the witnesses provided by the opposing counsel.

A witness is someone who is called to testify what he or she has seen, heard, or otherwise observed (American Bar Association, 2014). There are two types of witnesses: general and expert. General witnesses are asked to provide the facts of what they have seen or heard. They may be asked to identify any items that have been entered into evidence. They are not usually qualified to give their opinions or make conclusions about what they have observed. Expert witnesses are qualified in a particular field and may give their opinions or make conclusions based on their qualifications. Expert witnesses may be asked to provide the reasons for their opinions or conclusions.

There are a few different standards set by the legal system that describe what allows an expert opinion to be accepted as evidence in a case (Richards & Tussey, 2013). The *Frye* standard, generated in 1923, does not allow an expert opinion unless the technique used to obtain the opinion is generally accepted as reliable in the relevant scientific community. The Federal Rules of Evidence, introduced in 1975, permits the expert opinion if it is helpful to the case and is accepted by the specialized professional community. The *Daubert* rule, formed from three US Supreme Court Cases in the 1990s, allows a judge to make a determination about the admissibility of expert testimony based on whether it meets criteria for an opinion that is scientifically valid and accepted by the profession. Currently, *Daubert* is commonly used in legal proceedings; however, the other two standards or some variation of the standards are still used in some jurisdictions.

History of Psychology in the Legal System

Psychology has not always had an influence in the legal system. It was not until the early 20th century that psychologists began to provide their opinions on the legal process (Costanzo & Krauss, 2010). In 1906, Freud warned Austrian judges that their decisions could be biased by what Freud described in his theory as “unconscious processes.” He also opined that his theory could provide insight into criminal behavior and improve the legal system. Despite that, psychologists were still slow to envision the possible applications of their field to the legal system. In 1908, a psychologist named Hugo Munsterberg wrote a book called *On the Witness Stand* that suggested that the intersection between psychology and law was a neglected field that needed rigorous investigation. The book was not well received by the legal community. A 1909 critique of the book attacked Munsterberg’s ideas, stating his claims for the capabilities of psychology in the field were exaggerated. In effect, Munsterberg failed to inspire legal scholars or research psychologists to investigate the field. Despite the lack of recognition in his lifetime, Munsterberg is acknowledged as a founding father of psychology and law.

In 1908, another important event for the insertion of psychology into law occurred. The court case, *Muller v. Oregon*, was about limiting the workday for women in factories (Costanzo & Krauss, 2010). In this case, the lawyer, Louis Brandeis, filed his famous Brandeis Brief, which cited evidence that overworking women led to poorer health in future mothers, leading to higher rates of infant mortality and child neglect. This evidence would not be considered rigorous science by today’s standards, but the court took the brief under consideration in the ruling. This set the precedent for allowing the use of social scientific evidence in the US Courts.

The investigation into the intersection of psychology and law remained dormant for two decades (Costanzo & Krauss, 2010). In the late 1920s, the emergence of the *legal realism*

movement inspired growth in the field of social science and law. Legal realism developed as a divergence from the status quo of judicial decisions that reflected the principles found in nature. The established method had led to judges using careful logic to deduce the one correct decision in the case. The legal realists believed that judges create their own understanding and interpretations of the law. Therefore, the social context and social effects of the laws were important factors that were not previously considered. These ideas of legal realism led to an insistence that the behaviors of lawyers and judges be carefully and rigorously examined.

As evidence of the changing climate of the field, Yale Law School appointed a psychologist to the faculty of the department in 1927 (Costanzo & Krauss, 2010). This created excitement about the potential of what could be achieved in the partnership between the two disciplines. Scholars were no longer disregarding the contributions of psychology to law. By 1930, The American Bar Association proclaimed that psychology must be recognized as part of the legal system. Despite the enthusiasm regarding this new partnership, scholars were not very successful in encouraging the legal system to use their research findings. However, the social and political climate of the 1950s and 1960s helped further the field of psychology and law. The US Supreme Court included research by social scientists that essentially stated that separate facilities led to a feeling of inferiority for its decision in *Brown v. Board of Education*, which ultimately led to the racial integration of schools.

The American Psychology-Law Society was established in 1969 (Costanzo & Krauss, 2010). This society represents the optimism regarding the partnership between psychological and law research. Its major journal, *Law and Human Behavior*, began publishing in 1977 and is still publishing research as of 2016. The focus of this journal is to have a forum where multidisciplinary researchers discuss issues surrounding the relationship between human

behavior and the law, legal system, and legal processes (American Psychological Association, 2016). Interest in the field continues to expand and several other journals that feature research between the two disciplines have also been established. Among these, include *Behavioral Sciences & the Law*, *Criminal Justice and Behavior*, *Law & Society Review*, and *Psychology, Public Policy, and Law*.

Role of Psychologists in the Legal System

There are three distinctive roles that a psychologist can have in the legal system: advisors, evaluators, or reformers (Costanzo & Krauss, 2010; Wrightsman et al., 2002). One of the simpler roles of psychologists can have is as an advisor. As advisors, lawyers and judges accept the perspectives of psychologists through testimony in court. This is a simpler role because the nature of the relationship is already defined by the legal system. In their testimony, psychologists speak to a particular aspect of the case. For example, lawyers hire psychologists to assess whether a defendant meets criteria for the legal definition of insanity. Other times, the lawyers will ask psychologists to evaluate a defendant's competency to stand trial or to assess perceived dangerousness of defendant in the future. Psychologists do not have to provide testimony to fulfill a role as an advisor. They can act as trial consultants. Using their knowledge of the psychological concepts that underlie the processes of a trial, psychologists assist lawyers with jury selection, witness preparation, and trial strategy in order to help create outcomes that are more favorable for their clients.

The second role that psychologists can have in the legal system is as an evaluator (Costanzo & Krauss, 2010). In their role as evaluators, psychologists conduct research on the effectiveness of various aspects of the legal system. One example might be evaluating whether prison is a deterrent for crime or whether drug education programs succeed in preventing

substance use in children. Evaluation research can also be used to investigate how well juries understand instructions that are given to them. Evaluation research comes in two forms: formative and summative. Formative evaluations assess the effectiveness of a program on a continual basis. These evaluations serve to guide program development by identifying where adjustments can be made to improve effectiveness. Summative evaluations occur after the completion of a program. These evaluations determine how well a program has met its goals and whether the program should be continued in the future.

The third role that psychologists can have is one of reformer (Costanzo & Krauss, 2010). Reformers integrate results of psychological evaluations and research into the legal system. As reformers, psychologists are not just conducting research to satisfy intellectual curiosity, but they are also identifying ways to implement their findings.

In their roles as advisors, evaluators, or reformers there are five possible pathways where psychologists can influence the legal system (Costanzo & Krauss, 2010; Wrightsman et al., 2002). The first pathway is through expert testimony. During court proceedings, witnesses give opinions based on the facts in evidence and may give a reason for that opinion based on their expertise. Experts can be either *fact witnesses* or *opinion witnesses*, depending on their prior involvement with a litigant. Fact witnesses are involved in the care of a litigant prior to the court proceedings. Opinion witnesses are not involved with the care of the litigant and their participation is to comment on various aspects of the case. Depending on the jurisdiction, in order for testimony to be admitted into evidence, it has to be scientifically valid and generally accepted by other professionals in their field (i.e., the Frye test or Federal Rules of Evidence) or a judge can decide using Daubert standards (Richards & Tussey, 2013).

The second pathway a psychologist can use to influence the legal system is through cross-disciplinary training (i.e., psychologists can obtain a degree in law in addition to their degrees in psychology or lawyers can obtain a degree in psychology; Costanzo & Krauss, 2010). Cross-disciplinary training could help lawyers become more aware of scientific rigor and the psychology involved in testimonies. For psychologists, it could help provide knowledge of various laws and a better understanding of how legal proceedings work.

The third pathway a psychologist can influence the legal system is through Amicus Curiae Briefs (Costanzo & Krauss, 2010). These “Friend of the Court” briefs educate other participants of the legal system about psychological issues. Psychologists are able to present the information that is pertinent to a particular case without being directly involved in the case. The fourth pathway is by publishing their research findings. Psychologists can investigate the legal system or the impact of social issues on the legal system. Unlike the Amicus Curiae Briefs, this research is broadly disseminated, rather than presented directly to the legal system. The fifth pathway is by influencing legislatures and public policy. Psychologists can act as consultants or advisors to those creating and enforcing laws.

Neuropsychology

Neuropsychology is the study of the relationship between the brain and behavior (Kolb & Whishaw, 2009). It combines knowledge from many different disciplines including anatomy, biology, biophysics, physiology, philosophy, and pharmacology to help better understand this relationship between the brain and behavior. Clinical neuropsychologists have specialized knowledge of functional neuroanatomy, principles of neuroscience, brain development, neurological disorders and how normal and abnormal brain functioning manifests in behaviors.

They use this knowledge to assess, diagnose, and treat patients who have developmental, neurological, medical, or psychiatric conditions.

The concept of neuropsychology and the link between brain and behavior is not a new idea. Historically, the concept is often attributed to Hippocrates, who identified the brain as the site that controls all of the senses and is responsible for human intellect (Kaszniak, 2002). Franz Gall, an important scientist in the field, theorized that there was localization of function (specific areas of the brain are responsible for specific functions). Other important figures in neuropsychology were Broca, Wernicke, and Jackson who provided evidence that speech and language were associated with the left hemisphere.

Using the term, neuropsychology, to describe the relationship between brain and behavior is relatively new (Benton, 2000; Bruce, 1985). It was first used by Sir William Osler in 1913 (Zillmer, Spiers, & Culbertson, 2007). It gained more popularity after Karl Lashley began using it around 1936 and D. O. Hebb in his book in 1949. In the 1950s, neuropsychology replaced the more archaic terms for this concept, such as “psychoneurology” and “brain pathology” (Benton, 2000; Bruce, 1985).

In 1935, Ward Halstead established the first neuropsychological lab at the University of Chicago in order to study the effects of brain damage (Sternberg, 2003; Weiner, 2003). Halstead proposed one of the early theories of brain function that suggested four biologically based abilities located in the cortex of the frontal lobes. From observations in his laboratory, he concluded that there was not a single psychological test that could completely demonstrate the scope of dysfunction from brain damage. Therefore, he created a series of tasks to assess different aspects of cognitive, perceptual, and sensorimotor deficits. These tasks became the basis for the first assessment battery of cognitive functioning, called the Halstead-Reitan

Neuropsychological Test Battery, which was normed for adults in the 1950s. This battery would later be adapted to include children as young as five years old.

Until World War II, very few psychologists researched and treated people with brain disorders (Boake, 2008). These issues were seen as primarily medical and therefore fell under the purview of physicians. After the war, the field of psychology gained recognition and acceptance in other fields. Psychologists made major contributions to the investigation of cognitive deficits caused by brain damage. Interest in the field grew rapidly. In the early 1960s, the first journals dedicated to neuropsychology were created. The International Neuropsychological Society, which was the first organization of members that study the brain-behavior relationship, was founded in 1967. Clinical interest in the field kept growing exponentially, with many societies, journals, conferences, and training programs dedicated to neuropsychology. Of note, the National Academy of Neuropsychology began in 1975. Division 40 (Clinical Psychology) began in 1980 and is now one of the largest divisions of American Psychological Association (APA).

In 1996, clinical neuropsychology became recognized as a specialty of psychology by the APA (Boake, 2008). As a specialty, neuropsychologists serve different populations, address different problems, and use different methods of assessment than clinical psychologists. In their typical training, clinical psychologists do not encounter the specialized knowledge of brain-behavior relationships competencies that are required to serve this population. In 1997, the Houston Conference on Specialty Education and Training in Clinical Neuropsychology established training guidelines for this specialty.

Currently, clinical neuropsychology is best understood as a combination of a scientific and a clinical field. In the scientific arena, neuropsychology investigates the brain-behavior

relationships through descriptive studies of people with brain disorders. In the clinical arena, neuropsychologists assess and treat people with brain disorders.

Neuropsychology in Legal Settings

Neuropsychologists can also apply their specialized knowledge to proceedings that can be adversarial in nature (Sweet & Giuffre Meyer, 2012). This particular use of neuropsychology in the legal system is called forensic neuropsychology. Clinical neuropsychologists have been practicing in forensics for decades (Sweet et al., 2002). The field has seen considerable growth in both the participation of neuropsychologists in legal proceedings and publications in relevant journals.

The growth of forensic neuropsychology was not consistent between the civil and criminal systems (LaDuke, DeMatteo, Heilbrun, & Swirsky-Sacchetti, 2012). Initially, the use of neuropsychologists in forensics rapidly grew in the civil courts. There has been an increase of their use in criminal cases only in the past decade. LaDuke et al. (2012) cite this as a problem because much of the research has investigated the role of neuropsychologists in the civil court system, leaving the understanding of neuropsychology in criminal cases largely unknown.

A survey of clinical neuropsychologists with experience in the forensic context revealed that neuropsychologists participate in the following legal questions: personal injury, civil competency, criminal competency, sentencing, insanity, and child custody (LaDuke et al., 2012). Civil competency questions include assessing someone being able to make personal or financial decisions, being able to testify, and being able to consent to treatment. Criminal competency questions include assessing competency to stand trial, testify, waive Miranda rights, plead guilty, be sentenced, represent one's self, and be executed. The neuropsychologists who participated in this survey also responded to questions regarding the sources of their training. Their

neuropsychological knowledge most commonly came from their graduate training. Their forensic training was commonly received through continuing education. Many followed the training trajectory of early specialization in neuropsychology followed by post-doctoral forensic training. The training pattern suggests that those who practice forensic neuropsychology spend more time becoming experts in neuropsychology than in forensics. This is consistent with the thought that expert witnesses should be highly trained in their field of expertise, rather than in forensic issues. However, forensic neuropsychology experts (e.g., Heilbronner, 2004) note that since there are essential differences between clinical and forensic assessments, training in forensics is necessary. Additionally, neuropsychologists should engage in ongoing training in forensics in order to understand changing legal standards and the application of current neuropsychology research in the legal system.

Pediatric neuropsychology is a subspecialty of neuropsychology that studies the relationship between the brain and behavior in children (Lucas et al., 2014; Sherman & Brooks, 2012). This area of neuropsychology examines the effect of developmental disorders on the brain and resulting behaviors, in addition to the effects of trauma and disease. With this and some other factors, children add an additional layer of complexity that is not seen with adults when they become involved in forensic evaluations (Sweet & Westerveld, 2012). For example, evaluations of children also include parents or caregivers, who may have responsibility for the injury through either abuse or neglect. Additionally, while adults are usually evaluated for an injury or illness with a proximal cause, evaluations of children may include impairments that resulted from a more distal cause, such as a neurodevelopmental disorder (e.g., autism).

Ethical Challenges

As clinical neuropsychology continues to become more involved in forensics, it is important to consider the ethics related to this involvement (Sweet & Giuffre Meyer, 2012; Wong, 2006; Wrightsman et al., 2002). Neuropsychology in forensic settings creates ethical challenges that are unique to that particular field. Wrightsman et al. (2002) recommend that forensic training for neuropsychologists needs to include ethics so that the neuropsychologists can decide if they are able to accept the different ethics that may be found in the legal system. If they cannot, then they should not participate in forensics. One important ethical factor to consider is that the forensic setting is very different from clinical or academic settings. Forensic settings are adversarial in nature, which is quite opposite to the collaborative atmosphere in the other settings. Additionally, psychologists will interact with many other disciplines in the forensic setting. An ethical dilemma that neuropsychologists may face is working with individuals who do not possess the same values as psychologists.

Neuropsychologists must also contend with the intricacies of having a dual role as a clinician and as a forensic specialist (Sweet & Westerveld, 2012). In some cases, neuropsychologists may find that an individual with whom they have worked has filed a lawsuit and requires their expert testimony. In this example, typical issues of confidentiality between a patient and clinician no longer apply.

Another ethical challenge that neuropsychologists may face in forensic settings is that of objectivity and bias (Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012). What this means is that it is commonly believed that witnesses, including neuropsychologists, abandon objectivity and become advocates for whichever side hired them. While this is consistent with ideologies that state that psychologists should advocate for their clients, it presents problems

within the forensic setting, which attempts to consider all the facts of the case, not just the conclusions presented from one side. One final ethical challenge that neuropsychologists encounter is related to the level of certainty that is asked of them (Sweet & Westerveld, 2012). In forensic settings, there is a legal burden of proof that may require neuropsychologists to be more certain of their conclusions than what they would have to be in their clinical practice.

Chapter 3: Research Design and Method

Overview

Sweet and Giuffre Meyer (2012) used the search terms neuropsychology, neuropsychologist, and neuropsychological of the LexisNexis Academic (LexisNexis, 2015a) database to illustrate the growth of the use of neuropsychology in the US legal system. This study seeks to replicate and extend this research by including an additional five years and generalizing the search strategy. Sweet and Giuffre Meyer may have missed neuropsychological terms, such as “neuropsychodiagnostic” or “neuropsychoeducational.” Additionally, the present research delves deeper into the litigation to discern issues and topics that are relevant to the role of neuropsychology in the legal system as well as examining pediatric cases.

Research Questions and Hypotheses and their Rationales

The purpose of this study was to investigate the use of the profession of neuropsychology in any capacity in the US legal system since the 1950s. It was expected, based on the reported trends from previous inquiries on this subject (Kaufmann, 2009; Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012; Taylor, 1999), that the use of neuropsychology will increase with each year. These previous research studies did not address the capacity in which neuropsychology was used nor did they examine pediatrics. Therefore, a hypothesis could not be formed to describe the role neuropsychology played in the cases in 2014. However, based on the previously reported trends of the use of general neuropsychology, it was expected that the use of pediatric neuropsychology has also increased with each year.

Research Design

This research involves the use of the methodology of empirical research in law (Cane & Tushnet, 2005). It has been used with increasing frequency since the 1990s, especially when there is a combination of legal and psychological research questions (Eisenberg, 2004). This form of scholarship directly examines court proceedings in order to better answer questions about the law and legal institutions that cannot be answered through the examination of secondary sources. This technique, in particular, was chosen for this research because it directly informs investigators about the use of neuropsychology in court cases without anecdotal, secondary, or tertiary biases that may occur with other research methods.

Population and Sample

LexisNexis Academic (LexisNexis, 2015a) is an online academic research database with a comprehensive collection of primary and secondary legal research sources. Of particular importance to this dissertation are the federal and state court decisions for all 50 states and territories dating back to the 1790s. The present sample was identified using the search term “neuropsych!”. This term allowed us to identify all cases that mentioned any word with the stem neuropsych.

Procedures

The sample retrieved from LexisNexis Academic (LexisNexis, 2015a) was downloaded into Microsoft Word (Microsoft Office Professional Plus 2010, Version 14.0.7166.5000). These documents were then imported into QRS International’s NVivo 10 Software (NVivo 10; QRS International Pty Ltd., 2012) for computer assisted coding of the court cases. For this research, coding was completed using a “Text Search” query, meaning that NVivo 10 identified all occurrences of a word, phrase, or concept within each case. A list of terms that were coded,

along with their frequencies, can be found in Tables 1-5. The results of the coding matrix were exported into SPSS (IBM SPSS Statistics, Version 23.0.0.0) for further analysis. Not all terms could be coded with the NVivo 10 query tool. Important case qualities, such as the year, whether the case was heard in state or federal court, and the court level were manually coded and added to the dataset in SPSS (IBM SPSS Statistics, Version 23.0.0.0).

To address the research question related to pediatric neuropsychology, several search terms were child-related (child, juvenile, minor, pediatric, and youth). The context of the terms is unknown when using the Text Search query in NVivo 10. For example, the term *minor* could refer to a minor injury or a person who is not an adult. Therefore, the cases where these terms were present were inspected manually. The approach to this inspection was that a case was coded as pediatric if a child (defined as a person under the age of 18) had an interaction with neuropsychology that was described in the case. The outcome was added to the overall dataset in SPSS (IBM SPSS Statistics, Version 23.0.0.0).

SPSS (IBM SPSS Statistics, Version 23.0.0.0) was used to produce descriptive statistics of the dataset and conduct an ANOVA to test the polynomial trend of the data over time. Microsoft Excel (Microsoft Office Professional Plus 2010, Version 14.0.7166.5000) was used to visualize these statistics. Lastly, in order to obtain a current trend for the capacity in which neuropsychology has in the court cases, the most recent full year of court cases (2014) was analyzed manually to identify the context in which neuropsychology was presented in the case.

Instrumentation

LexisNexis Academic provides access to US federal and state court decisions dating back to the 1790s (LexisNexis, 2015b). Because LexisNexis Academic data is publicly available, it offers many advantages to psycholegal research. It is available in over 2,000 universities,

allowing access to millions of students and thousands of faculty and researchers. It is also available in many community libraries. It allows for collection and analysis of data that would not ordinarily be collectible otherwise. Since the transcripts of court proceedings are reviewed by multiple parties, interviewer bias is reduced. Problems with access to subjects and informed consent are eliminated. It permits transparency in the collection and coding of the data. The behavior of individuals and various organizational/societal contexts can be collected. It also allows for the longitudinal collection of data. It eliminates the problems of conducting experimental designs. It is relatively well accepted by grounded theorists, allowing for deduction and subsequent contributions to the theory development.

Data Processing

The litigated cases from LexisNexis academic were systematically coded by NVivo 10, which is a form of software called ‘Computer Assisted Qualitative Data Analysis Software (CAQDAS). Other similar software exist, but NVivo 10 was selected over its competitors due to its credibility within the discipline of psychology (Leech & Onwuegbuzie, 2011). This software is used by 1,500,000 users to organize unstructured information, such as what is found in litigated cases. It allows for analysis of more data and discerning of more variables and interrelationships. For example, the current study contains over 100,000 pages of information, which would not be efficiently analyzable otherwise. A disadvantage of NVivo 10 is that context could be lost while coding terms, although it does allow for searching of terms within a context of other terms, known as a “Word Proximity Search.”

Assumptions

The major assumption of this research is that not every single court case that is heard in the United States is published to LexisNexis. The assumption is that the population of cases that

is not published to LexisNexis is similar to the population that is, thus making the research generalizable.

Limitations

Similar to a review of literature methods, a limitation of using LexisNexis is that the researcher is not directly involved in collecting the data. Court officials who write up the case summaries determine which data is present in the documents. Since these are court, and not psychology documents, the legal aspects of the case are the significant feature. Additionally, these officials may or may not have any psychological knowledge, which would also affect what they decide is important information to include. The other limitation of using LexisNexis is that the case documents would not mention instances when lawyers consulted with neuropsychologists about the cases and did not disclose their participation. Neuropsychology would have been involved in these cases, but researchers would not be able to identify them. A limitation of coding using NVivo 10's Text Search query tool is that terms may have been missed if they were misspelled by the court officials who wrote the documents.

Ethical Assurances

The dataset was comprised of cases that originate from information that is considered public record. An email correspondence with the Institutional Review Board at The Chicago School of Professional Psychology dated October 7, 2014, verified that this research would not need to be submitted for review since it would fall under the category of Comprehensive Review and Evaluation of Literature. Since this research does not involve human or animal subjects, and involves a review of existing and publicly available data, according to pages 4-5 of the *IRB Policies & Procedures Manual*, no further review of the project is required (Institutional Review Board, 2012). This was confirmed directly with the Institutional Review Board of The Chicago

School of Professional Psychology (Turah Flowers, Institutional Review Board Assistant, personal communication, October 7, 2014).

Additionally, there may be some concern about protecting the privacy of children involved in legal proceedings. Observations of the dataset noted that cases involving children often did not disclose their identities. They remained anonymous through use of initials and pseudonyms for their parents.

Summary

In a replication and extension of previous research conducted by Sweet and Giuffre Meyer (2012), 9,362 US court cases that involved the use of neuropsychology were identified in LexisNexis Academic (LexisNexis, 2015a) using the search term neuropsych! between the years 1900 and 2015. The results were displayed to illustrate the trends of the use of neuropsychology in the legal system since 1945. Using Computer Assisted Qualitative Data Analysis Software, these cases were analyzed to code for specific terms that could provide insight into what role neuropsychology may have played in these cases. Additionally, cases were further categorized to identify ones that included a pediatric population to illustrate the trends of use of neuropsychology with children in court cases.

Chapter 4: Findings

Descriptive Statistics

The search for cases from LexisNexis Academic began with the year 1900. However, the term was not found before 1944. A May 14, 2015 search of LexisNexis Academic from the years 1900 to December 31, 2014 yielded 11,257 cases. A subsequent search to include cases from 2015 was drawn on August 22, 2015, which yielded an additional 513 cases. Thus, the total number of cases that were retrieved from LexisNexis Academic is 11,770. However, 2,408 cases were eliminated because the search term neuropsych provided cases that contained terms related to neuropsychiatry that did not mention neuropsychology. Therefore, the total number of cases in the dataset was 9,362.

Of the total of 9,362 neuropsychology cases in the dataset, 1,083 (11.6%) were verified as pediatric, leaving 8,279 (88.4%) identified as adult cases. Tables 1-5 display the adult and pediatric subset of frequencies for different variables, organized into these categories:

Organization in the Legal Hierarchy, Legal Issues, Neuropsychological Issues, Sources of Neuropsychological Injury, and Other Important Case Features.

Table 1

Frequencies of Adult and Pediatric Cases involving Neuropsychology from 1945 to May 2015 in the US Legal Hierarchy

| | System of Law | | Court Branch | | | Court Level | | | |
|-----------|---------------|-----------------|--------------|----------------|--------------|----------------------------|----------------------------------|----------------|--------------|
| | <u>Civil</u> | <u>Criminal</u> | <u>State</u> | <u>Federal</u> | <u>Other</u> | <u>District/ Trial</u> | <u>Intermediate/ Appeals</u> | <u>Supreme</u> | <u>Other</u> |
| Adult | 5282 | 2997 | 3513 | 4726 | 40 | 4063 | 2855 | 1120 | 305 |
| Pediatric | 956 | 127 | 421 | 662 | 0 | 593 | 329 | 88 | 9 |
| Total | 6238 | 3124 | 3934 | 5388 | 40 | 4656 | 3184 | 1208 | 314 |

Table 1 displays the frequencies of adult and pediatric cases according to their US legal organization from 1945 to May 2015. For both adult and pediatric cases, neuropsychology is utilized more in civil cases than in criminal cases (63.8% and 88.3% for adults and children, respectively). Additionally, for both adult and pediatric cases, neuropsychology is included more in Federal Courts (57.1% and 61.1%) and mentioned in more cases heard in District/Trial Courts (49.1% and 54.8%).

Table 2

Frequencies of Adult and Pediatric Cases involving Neuropsychology from 1945 to May 2015 Involving Legal Issues

| | <u>Adult</u> | <u>Pediatric</u> |
|---|--------------|------------------|
| Americans with Disabilities Act | 280 | 72 |
| Death Penalty Issues | 2005 | 43 |
| Employee Retirement Income Security Act | 563 | 12 |
| Friend of the Court | 153 | 36 |
| Individuals with Disabilities Education Act | 32 | 358 |
| School Cases | 236 | 446 |
| Social Security | 2200 | 107 |
| Sexually Violent Predator Issues | 156 | 1 |
| Third Party | 736 | 76 |
| Vaccine | 66 | 72 |
| Workers compensation | 1016 | 40 |

Table 2 displays the frequencies of both adult and pediatric US court cases from 1945 to May 2015 involving specific legal issues that might be of interest to the court. It shows that neuropsychology in adult cases more often contained social security (26.6%) and death penalty issues (24.2%). However, in pediatric cases, neuropsychology was mentioned more often in school cases (41.2%) and, relatedly, the Individuals with Disabilities Education Act (33.1%).

Table 3

Frequencies of Adult and Pediatric Cases involving Neuropsychology from 1945 to May 2015 that Reference Neuropsychological Issues

| | <u>Adult</u> | <u>Pediatric</u> |
|------------------------|--------------|------------------|
| Autism | 146 | 196 |
| Brain Damage | 2944 | 181 |
| Dementia | 646 | 18 |
| Disability | 5158 | 758 |
| Epilepsy | 429 | 62 |
| Feigning | 304 | 8 |
| Malingering | 1348 | 24 |
| Memory | 3806 | 292 |
| Psychosis | 1429 | 63 |
| Traumatic Brain Injury | 902 | 63 |

Table 3 displays the frequencies of both adult and pediatric US court cases from 1945 to May 2015 that mention specific neuropsychological topics. It shows that, for both adult and pediatric cases, neuropsychology was mentioned most often in cases involving disability (62.3% and 70.0%, respectively). Memory is also a neuropsychological issue that was often mentioned in both these types of cases (46.0% of adult cases and 27.0% of pediatric cases). Interestingly, issues of autism were mentioned next most frequently with pediatric cases (18.1%). However, brain damage was next most often for adults (35.6%).

Table 4

Frequencies of Adult and Pediatric Cases involving Neuropsychology from 1945 to May 2015 that Reference Sources of Neuropsychological Injury

| | <u>Adult</u> | <u>Pediatric</u> |
|-------------------------|--------------|------------------|
| Accident, Motor Vehicle | 466 | 25 |
| Accident, Other | 2452 | 158 |
| Collision | 404 | 28 |
| Electricity | 720 | 54 |
| Insecticide | 18 | 2 |
| Lead Paint | 25 | 80 |
| Pesticide | 44 | 7 |
| Seizure | 881 | 118 |
| Teratogen | 10 | 5 |
| Toxic | 583 | 85 |

Table 4 displays the frequencies of both adult and pediatric US court cases from 1945 to May 2015 that contain information about possible sources of neuropsychological injuries. Accidents, other than motor vehicle, are mentioned most for both adult and pediatric cases (29.6% and 14.6% respectively). The second most common injury for both adult and pediatric cases are seizures (10.6% and 10.9%, respectively). Electricity injuries (8.7%) and exposure to toxic substances (7.0%) occur next most frequently in adult cases, whereas toxic substances (7.8%) and lead paint (7.4%) are next most frequent in pediatric cases.

Table 5

Frequencies of Adult and Pediatric Cases involving Neuropsychology from 1945 to May 2015 that Reference Other Important Case Features

| | <u>Adult</u> | <u>Pediatric</u> |
|---------------------|--------------|------------------|
| Competency/Capacity | 4023 | 459 |
| Credibility | 4348 | 424 |
| Guardianship | 204 | 42 |
| Impairment | 5950 | 585 |
| Insurance | 3246 | 209 |
| Malpractice | 273 | 80 |
| Murder | 2358 | 80 |
| Parental Rights | 256 | 74 |
| Relief/Leniency | 1912 | 37 |
| Vocation | 2553 | 162 |

Table 5 displays the frequencies of both adult and pediatric US court cases from 1945 to May 2015 that mention other important features of legal proceedings. It shows that there is a variety of issues that neuropsychologists involved in adult cases may encounter. Less frequently, neuropsychology is involved with malpractice, parental rights, and guardianship issues. In pediatric cases, neuropsychology most often deals with issues of impairment, competency, and credibility.

Hypothesis 1

The first hypothesis was that it was expected that the profession of neuropsychology would increase each year. Figure 1 illustrates the continued growth of neuropsychology in the legal system, beginning in 1968. Prior to 1968, there was one case in 1954 that mentioned neuropsychology. In analyzing the growth curve between 1975 and 2014, there was a significant quadratic trend, $F(7,32) = 188.09, p < 0.0005$. This indicates that there is exponential growth in the rate of the use of neuropsychology in the US legal system.

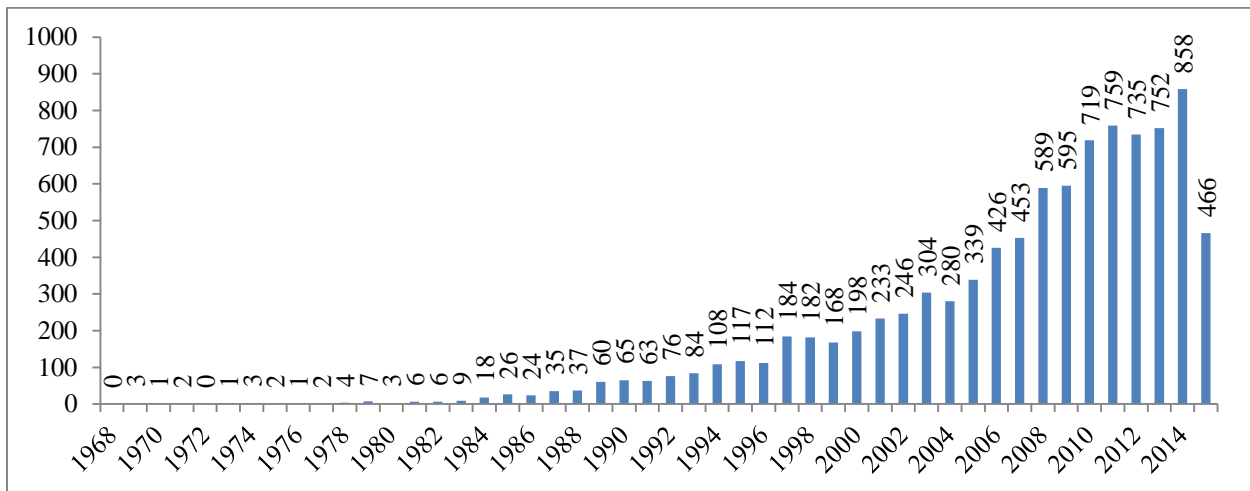


Figure 1. Frequencies of court cases by year that include neuropsychology terms from 1968 to May 2015. This figure displays the growth of the use of neuropsychology in the legal system.

Hypothesis 2

The second hypothesis was related to how neuropsychology has been used in the forensic setting. Recall that the three different roles that neuropsychology can enter into the legal system are as advisors, evaluators, or reformers (Costanzo & Krauss, 2010). Examining the 2014 court cases did not provide information about neuropsychology in an evaluator capacity. Eighty-two cases (9.6%) involved mentioning the integration of neuropsychological research, which is how neuropsychology could be used in a reformer role in legal proceedings. In an advising capacity, neuropsychology was used in 682 cases (79.5%). This can be broken down further into assessment, testimony, report, consultant, and treating (see Figure 2).

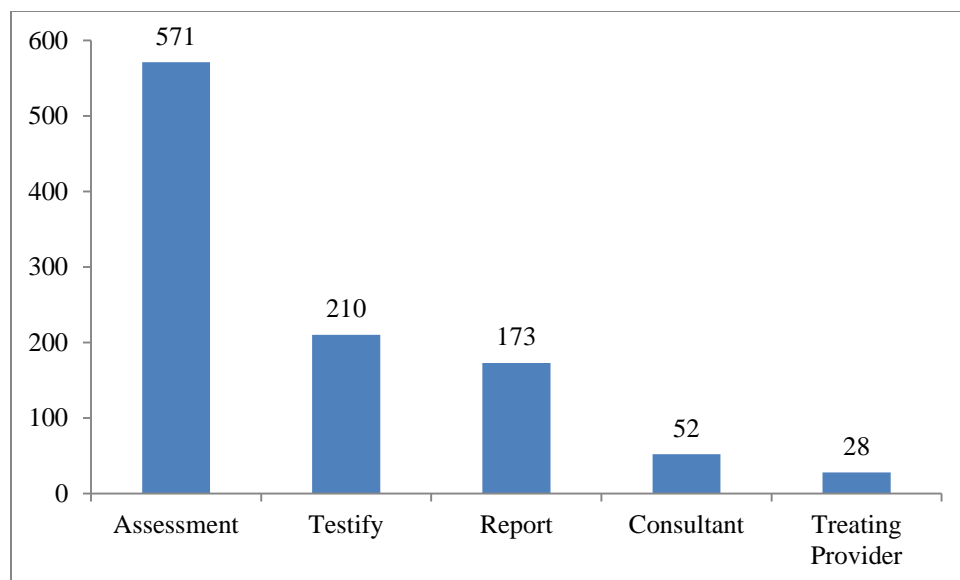


Figure 2. Frequencies of court cases in 2014 of neuropsychology in an advising role by how it was used in the case. There is some amount of overlap between these categories, indicating that neuropsychology is not introduced as part of a case in a singular capacity.

There was also a subset (150, or 17.5%) of cases where neuropsychology was mentioned, but not necessarily involved in that particular case. In particular, in 114 cases (13.3%), someone wanted neuropsychological involvement, but it was not included for any of several reasons: neuropsychology was still pending, neuropsychology was ordered, but identified patient did not appear for the appointment, a professional indicated that neuropsychology was not indicated, or no one ordered it (see Figure 3).

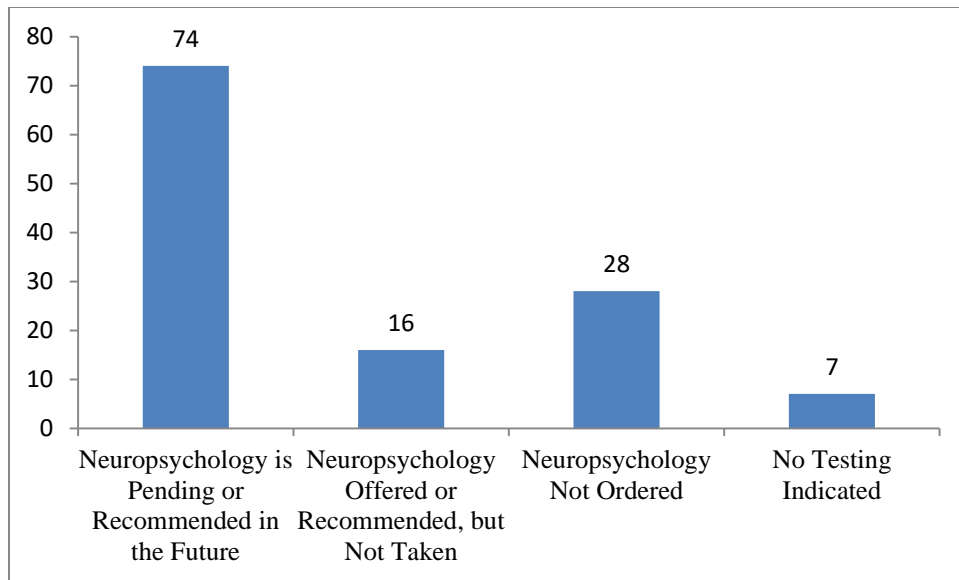


Figure 3. Frequencies of court cases in 2014 when someone involved in the case wanted neuropsychology, but it was not included. There were four possible avenues that were mentioned for how this could occur. There is overlap between these categories, which may result from someone addressing a concern about the lack of neuropsychological involvement.

Hypothesis 3

The third hypothesis was that it was expected that the use of pediatric neuropsychology would increase each year. Figure 4 demonstrates this growth, beginning in 1968. In analyzing the growth curve between 1975 and 2014, there was a significant quadratic trend, $F(7,32) = 110.45$, $p < 0.0005$. This indicates that there is exponential growth in the rate of the use of neuropsychology with children in the US legal system.

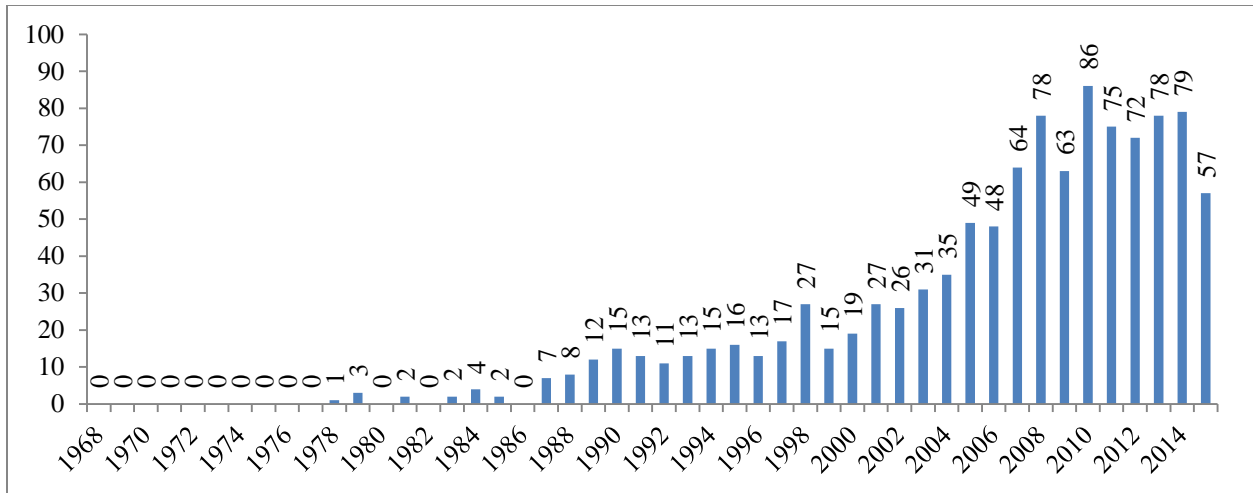


Figure 4. Frequencies of court cases by year involving children that include neuropsychology terms from 1968 to May 2015. This figure displays the growth of the use of neuropsychology with children in the legal system.

Discussion of Findings for Hypothesis 1

The first hypothesis predicted that the use of neuropsychology in the US legal system would continue to increase each year. The data in this research reflect that it has grown exponentially since at least 1975, which is about the time when the term began to appear consistently every year. In the 1970s and 1980s, neuroimaging technologies became more sophisticated and the research community recognized the potential benefits of their use (Bulkeley, 2005). This culminated to a pivotal point in 1990 when President George H.W. Bush declared the coming decade as “The Decade of the Brain,” encouraging more emphasis on programs to advance our knowledge (Bush, 1990). The exponential growth seen after this decade could be related to the increased awareness of neuropsychology as a field. Additionally, the growth of the use of neuropsychology could be a reflection of the changing medical environment, as Taylor (1999) asserted. Specifically, it could be that with an increase in TBI survival rates, neuropsychology became more relevant to post-injury evaluation and care, which subsequently expanded into the forensic realm.

When people were unable to survive their injuries, they were not seeking neuropsychologists for functional evaluations. However, it is probably much more complicated than a higher number of litigants available to request neuropsychological services. The growth is also likely related to the doctrine of *stare decisis* in the legal system, which stipulates that the court system uses the results of previous litigation to inform future decisions in related cases. Therefore, the acceptance of the utilization of neuropsychology in legal proceedings depends on how it was perceived in previous litigation. The growth of neuropsychology in legal proceedings

suggests that previous court officers recognized the value of neuropsychology's contribution to the cases, thus encouraging its future use.

The exponential growth of the use of neuropsychology in the court system could lead to a higher demand for qualified experts to fulfill this need. As more neuropsychologists become available to meet this need, neuropsychology would be able to be called upon more often in the legal system. However, the growth is not likely to continue like this. It is likely that there will eventually be a time when there are more neuropsychologists than the court system will be able to utilize. At that point, when the market is saturated, neuropsychologists who wish to continue their forensic practice will need to make sure they have focused their training and experience to match the needs of a specific legal domain.

Discussion of Findings for Hypothesis 2

It seems that neuropsychologists often assume the role of advisor in court proceedings. This seems like a reasonable finding after considering the definitions of the various roles that neuropsychologists have in the legal system. Advisors primarily use their expertise to assist with particular aspects of cases. It is unlikely that evaluators would present their findings as part of legal proceedings. As reformers, it is possible for research to be integrated into court cases and there were a few instances of that occurring. However, reformers can also disseminate their research through publication in journals and influence policy makers without the use of the courts.

In their role as advisors in court cases, neuropsychologists were most often requested to conduct assessments. This is not surprising given the deep historical roots that neuropsychology has with assessment (e.g., Halstead-Reitan). However, there were other ways that neuropsychology provided advising in the court cases. The important result was that there is

some amount of overlap between these categories. Therefore, when neuropsychology is incorporated into a case, it is not only done for a singular purpose. Neuropsychologists may need to be prepared to fulfill multiple duties when requested for forensic services. Additionally, they are much less frequently identified as treating providers in the cases. This suggests that often the only interaction neuropsychologists may have with the litigants is through the assessment requested by the attorneys or judges.

Discussion of Findings for Hypothesis 3

The third hypothesis predicted that the use of neuropsychology in pediatric cases would also continue to increase each year. As this is a relatively new branch of the field, it is no surprise that the frequencies were still relatively small as compared to the adult proceedings. However, just as with the overall use of neuropsychology, this area is also growing exponentially.

Comparison to Previous Research

This investigation was intended to replicate and extend the findings of previous research in this area (Kaufmann, 2009; Sweet & Giuffre Meyer, 2012; Sweet & Westerveld, 2012; Taylor, 1999). However, the frequencies obtained in this investigation do not correspond to the data reported by these researchers. This can be accounted for, in part, by the utilization of a different search strategy. The previous research chose different search terms in their surveys of LexisNexis. Taylor (1999) only searched for neuropsychologist. Kaufmann (2009) searched using the root “neuropsych-.” Sweet and Westerveld (2012) and Sweet and Giuffre Meyer (2012) conducted their search with three search terms: neuropsychology, neuropsychologist, and neuropsychological. This research searched for the stem neuropsych, which allowed for the inclusion of more terms related to the field, such as neuropsychometric or

neuropsychodiagnostic, or neuropsychoeducational. The search for the stem also allowed for the chance that whoever wrote up the case might have just used the abbreviation of neuropsych when referencing the field.

Important Issues Related to General Neuropsychology Training

Neuropsychology is involved in court cases in both systems of law, all branches of courts, and at all levels. This is seen in both adult and pediatric cases. Therefore, neuropsychologists who wish to pursue forensics may want to include training to gain familiarity with procedures in all of these court systems, including civil and criminal, as well as state and federal court procedures. However, it is assumed that professionals interested in forensics would pursue this level of training anyway. Considering the growth of the use of neuropsychology in the legal system so far, it is likely that neuropsychologists will be asked to provide their expertise at some point in their career, regardless of whether they initially had a professional interest in forensics. For example, this could happen through being a treatment provider to a patient who ends up in the legal system. Therefore, it may be prudent to recommend that basic legal training be incorporated into the curriculum of psychology programs to help all future psychologists understand the role they may play in the legal system.

Important Issues Related to Adult Neuropsychology Training

The research also revealed some topics that appeared more frequently than others and may serve as a guide for where future forensic neuropsychologists may want to focus some of their training. Adult neuropsychologists are most frequently involved in cases related to social security, death penalty issues, and workers' compensation. These legal issues may have specific demands of neuropsychologists in how they determine disability. Familiarity with these constraints would be beneficial for participation in these cases. In addition to having an

understanding of disability, adult neuropsychologists also more frequently provide their expertise in cases that mention brain damage, memory, injuries from seizures, and injuries from electricity. If this is indeed the areas where neuropsychology is called upon in court cases, then future forensic neuropsychologists may wish to include these areas as a focus in their training.

Important Issues Related to Pediatric Neuropsychology Training

Unsurprisingly, pediatric neuropsychologists are most frequently involved in school-related cases. An understanding of the conditions of the Individuals with Disabilities Education Act would probably help guide neuropsychological practice for these cases. Disability and memory were also frequently mentioned in the cases. Therefore, it would be important to train pediatric neuropsychologists to understand how to address these issues for the court.

Important Issues Related to Ethics

Previous researchers have presented a myriad of ethical challenges that neuropsychologists may encounter when they participate in the legal system (e.g., Kaufmann, 2009; Richards & Tussey, 2013; Sweet & Giuffre Meyer, 2012; Wong, 2006; Wrightsman et al., 2002). As neuropsychology continues to become more involved in the legal system, it is important for neuropsychologists to understand what is considered ethical behavior in legal settings. For example, it would be important for neuropsychologists to understand ethical issues such as informed consent, assent, limits of practice, competency, and protection of raw test data as they relate to the forensic field.

Limitations of the Research

As stated previously, there were limitations related to the instrumentation of the research. LexisNexis Academic is not an exhaustive database containing all of the court cases heard in the

United States. Therefore, it is possible that there is a branch of the court system that utilizes neuropsychology differently than what was reported here.

Another limitation is that, as advisors, evaluators, or reformers, neuropsychology could influence the legal system beyond the courtroom. The methods here are not able to address those pathways. An example of an advising role that would not be mentioned in legal proceedings might be if a neuropsychologist was asked to be a consultant for jury selection. Evaluation research is also not presented in legal proceedings. Neuropsychologists' roles as reformers when they are influencing lawmakers would also be an instance that would not appear in case summaries.

Future Directions

In the past few years since Sweet and Giuffre Meyer (2012) collected their data, it appeared as though the rate of growth was slowing down. However, the apparent tapering of the growth was not statistically different enough from the previous growth to warrant that this is indeed what has occurred. This anecdotal observation may just be an artifact of the natural ebb and flow of the data and in future years, the curve could continue to rise. However, since the field cannot grow at this rate ad infinitum, future investigations into this area will probably show the number of cases where neuropsychology was mentioned has reached an asymptote.

Other future directions of this field could include the development and evaluation of a forensic curriculum for neuropsychologists. As part of curriculum development, it might be important to survey court officials could inform the field about how they view the use of neuropsychology. Investigations could also be conducted to examine how neuropsychology influences the legal system outside of court cases.

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