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EXPERIENCES WITH WRITING AND READING NEUROPSYCHOLOGICAL REPORTS: NEUROPSYCHOLOGIST AND PARENT PERSPECTIVES

Zsofia Imre
Southern Illinois University Carbondale, zsofiaimre@outlook.com

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Zsofia Imre

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Approved by:

Michelle Y. Kibby, Ph.D., Chair

Kathleen Chwalisz, Ph.D.

Jeffrey Kellogg, Psy.D.

Debra Pender, Ph.D.

Valerie Boyer, Ph.D.

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Southern Illinois University Carbondale
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MAJOR PROFESSOR: Dr. Michelle Y. Kibby

Researchers have described common problems with psychological reports over the past several decades. Some of these issues can contribute to difficulties for neuropsychologists (e.g., efficiency, insurance reimbursement). Additionally, these problems contribute to difficulties with feasibility, readability, and satisfaction for the readers of psychological reports. However, research has been limited on the perceptions of neuropsychological reports specifically, especially related to parent experiences with neuropsychological reports. Hence, this study sought to understand the current report-writing trends, parents' experiences and satisfaction, and neuropsychologists' openness to adjusting their report-writing styles. Data were obtained through surveying parents and neuropsychologists on their experiences reading and writing neuropsychological reports, respectively, and changes these neuropsychologists would find acceptable and parents would find helpful. Data were analyzed utilizing a mixed methods approach. Results indicated that many of the common problems with reports have persisted, but there were some more pressing difficulties. Specifically, parents and neuropsychologists wanted to improve report-writing efficiency and reducing reading levels would be beneficial changes. Furthermore, parents experience significant difficulties with implementing recommendations. Additionally, neuropsychologists feel that they lack guidance on how to appropriately adjust their report writing. Thus, future research should continue to examine these factors to enact beneficial changes more appropriately in report-writing practices of neuropsychologists.

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CHAPTER 1

INTRODUCTION

Many researchers have examined psychological and psychoeducational reports with respect to client satisfaction, characteristics, usability, and readability. Findings have often revealed common problems among these types of reports. Several of these issues have been studied or considered since the 1940s (Taylor & Teicher, 1946), but it appears that despite this research many of the issues have persisted over time.

Specifically, researchers have stated that reports are often too long to read (Brenner, 2003; Bucknavage, 2007; Groth-Marnat, 2009; Harvey, 2006; Mayman, 1959; Michaels, 2006; Pei et al., 2011; Seagull, 1978; Squire, 2019; Taylor & Teicher, 1946; Umaña et al., 2019). Reports are also often too difficult for most readers to understand (Brenner, 2003; Bucknavage, 2007; Groth-Marnat, 2009; Harvey, 2006; Mayman, 1959; Michaels, 2006; Pei et al., 2011; Seagull, 1978; Squire, 2019; Taylor & Teicher, 1946; Umaña et al., 2019) and take an excessive amount of time to write (Allott et al., 2011; Baum et al., 2018; Bennett-Levy et al., 1994; Harvey, 2006; Pei et al., 2011; Postal et al., 2018; Schoenberg et al., 2018; Seagull, 1978; Sweet et al., 2003; Zimmerman & Jucks, 1983). Many readers have complained that reports lack individualization to the client (Axelrod, 2013; Bram, 2013; Brenner, 2003; Evans et al., 2019; Mastoras et al., 2018; Pei et al., 2011; Postal et al., 2018; Umaña et al., 2019) and are written in confusing or unhelpful formats (e.g., test-by-test format; Brenner, 2003; Mastoras et al., 2011; Schoenberg & Rum, 2017; Schoenberg et al., 2018; Zimmerman & Jucks, 1983). Furthermore, some studies have shown that these characteristics can contribute to difficulties with insurance reimbursement for services, given the excessive amount of time spent writing the reports

(Kanauss et al., 2005; Sweet et al., 2003). These problems also have many implications for the clients and families with which psychologists work.

Parents are a large group of readers of psychological, neuropsychological, and psychoeducational reports, and they must understand and implement the information (e.g., recommendations, diagnoses) provided in these reports (Mastoras et al., 2018). Thus, it is concerning that many readers report difficulties in understanding the reports. It is important to understand consumer expectations (e.g., parents', teachers', and clients themselves where applicable), as well as the helpfulness of the reports, for those who must use the information to improve the lives of clients, especially considering the many problems seen with reports.

Although many researchers do examine common characteristics of reports (e.g., consumer satisfaction, readability), most concern psychoeducational reports written by school psychologists for educators. Studies conducted outside of a school setting are generally focused upon private practice psychologists conducting psychological assessments across a wide range of fields and clinical populations. In contrast to psychological and psychoeducational reports, there is a dearth of studies directed toward neuropsychological reports specifically, and few of these studies examine the issues of readability and usefulness, especially for parents. These reports tend to focus on feedback from physicians, rather than the long-term implications of the report in daily life for those that must implement the recommendations.

Based on these issues, there appears to be a need for more specific studies on child/adolescent evaluation reports as read by parents and for neuropsychological reports in general. Hence, this study is an examination of common report-writing practices of neuropsychologists, as well as their openness to changing common styles of report-writing. Further, this study assessed parent preferences, satisfaction, and perceptions of usefulness to

determine areas of concern, as well as possible avenues for improvement. Because literature on this topic is scant, much of the review focused on psychological and psychoeducational reports. Research on neuropsychological reports and practices was included when it was available.

CHAPTER 2

REVIEW OF THE LITERATURE

The present study is an examination of the common report writing practices of neuropsychologists, parent perceptions of neuropsychological reports, and the acceptability of specific changes to report writing practices of neuropsychologists. The first section of this review will focus on a brief history and overview of the practice of neuropsychology. Following this, the review will discuss common report-writing practices for neuropsychological reports, as well as psychological and psychoeducational reports since the literature on neuropsychological reports is sparse. This review will detail the perceptions and satisfaction of common readers of reports (e.g., teachers, parents). It also will discuss issues of report readability, including implications for health literacy, readability formula calculation, and readability of reports. Moreover, this review will detail common problems with reports and recommendations for change. Finally, this section will conclude with a review of the purposes of the present study and hypotheses.

Neuropsychology

Neuropsychology is concerned with the relationship between the brain and behavior (Kolb & Whishaw, 2015). The practice of neuropsychology is generally focused on the use of assessment measures to determine the presence of brain dysfunction, as well as cognitive functioning of individuals (Lezak et al., 2012). Casaletto and Heaton (2017) provided a brief review of the history of assessment approaches in the practice of neuropsychology. The authors described the advancements of Luria in understanding the relationships between brain and behavior, and the early development of neuropsychological assessment. This led to the development of measures to assess problems related to brain dysfunction (e.g., cognition, memory, executive functioning).

Initially, all patients, regardless of presenting concerns, were administered the same comprehensive set of measures to assess functioning, known as a fixed battery approach. Halstead and Reitan were forerunners in this area, developing a battery of several neuropsychological measures that were given to all patients to determine the presence or absence of brain damage. Later, practitioners became more flexible in the batteries they used (Casaletto & Heaton, 2017). Fully flexible battery approaches are those in which practitioners select measures solely based on the individual (Rhodes et al., 2009). Currently, most neuropsychologists ascribe to a hybrid fixed-flexible approach that includes some fixed measures that are used with most clients, with additional measures added or subtracted based upon the presenting concerns (Casaletto & Heaton, 2017).

Today, neuropsychologists have many roles (Casaletto & Heaton, 2017). One role is to detect neurological dysfunction and guide differential diagnosis. This information can be used to ascertain the impact of neurological and/or medical dysfunction on client functioning. Neuropsychologists also assess cognitive strengths and weaknesses over time, often as related to neurodevelopmental or neurological disorders. These results frequently are related to functioning in daily life (e.g., school, job, driving). Finally, neuropsychologists typically provide recommendations to improve daily functioning (Casaletto & Heaton, 2017). Neuropsychologists can also be found in many settings (e.g., medical centers, private practice, schools).

The neuropsychological report is a key aspect of neuropsychological assessment (Postal et al., 2017), given that it is a tool used for making major decisions about the client/patient (e.g., school recommendations, services). Neuropsychologists have several goals for their reports. Reports should provide a picture of the patient, both in terms of assessment performance and other information (e.g., history, observations). In their reports, neuropsychologists discuss

strengths and weaknesses (Axelrod, 1999; Schoenberg & Scott, 2011), discuss etiology of areas of concern (Axelrod, 1999; Schoenberg & Scott, 2011), answer referral questions (Axelrod, 1999), and provide information on diagnosis (Schoenberg & Scott, 2011), prognosis and recommendations (Axelrod, 1999).

Assessment Report Writing

General Report Writing Trends

Most assessment reports share several common characteristics, many of which have been observed as far back as the 1940s. Taylor & Teicher (1946) outlined specific elements for psychological reports, which included the reason for referral, observations of behaviors (e.g., cooperation, effort, attention, speech), test results with statements regarding the validity of the findings, test analysis that varies based on reason for referral, and a summary that links to the referral question. Similar patterns of psychological report-writing were seen in the 1970s. Applebaum (1970) noted that reports were meant to be highly persuasive in terms of both the findings and recommended services. Seagull's (1978) description of psychological report formats remained similar, stating that one should include a precise reason for referral, behavioral observations, test results, and summary. However, additional sections also were included, such as a history of the client based upon the reason for referral, a list of assessment procedures used, interpretations, conclusions, and recommendations. The recommendations were described as the most important part of the report, and it is suggested that they be written as prescriptive (Seagull, 1978).

More recently, little has changed in psychological report formats. Sattler (2014) suggested a similar sequence of sections, including assessment procedures, reason for referral, clinical history, behavioral observations, testing results, clinical impressions, recommendations,

and summary. Here, the author asserted that addressing referral questions is the most valuable piece of the report, rather than the recommendations as discussed above.

Several authors have discussed other recommendations for psychological reports. Seagull (1978) suggested that one use standard language, check for errors, and avoid informal language (e.g., "slang") so as not to damage credibility. Sattler (2014) also discouraged unnecessary jargon, with consideration for the primary audience of the report. Specifically, the test analysis section should be tailored to the reader (e.g., physicians versus parents), with consideration for the level of detail needed. Also, it is important to gather information from multiples sources to get the whole picture of the child in different settings (Pei et al., 2011). Sattler (2014) emphasized that integration of information is a key component of a report.

In one study of psychoeducational report characteristics and reading level, observations and test results were generally more than half of the report (Mallin et al., 2012). The recommendations section comprised approximately 15% of the total report, and this section generally had the highest reading grade level, where the average reading level of the report was 10.8th grade and the recommendations section was written at the 12.7th grade. Mallin and colleagues further found that reports may contain either thematic (i.e., by skill or ability area) or test-by-test formats of discussing the test results, but thematic writing often has a higher reading grade level, which the authors assert may be due to the small number of thematic report examples (five).

Neuropsychological Reports

Few studies were found regarding common characteristics of neuropsychological reports. Donders (2001) conducted a large-scale survey study resulting in a two-part publication of common report writing trends among neuropsychologists. Neuropsychologists were surveyed on

aspects of their practice and setting as well as their report writing. Participants were primarily recruited through random sampling 750 members of the American Psychological Division 40 Clinical Neuropsychology. Of those samples, 414 survey responses were gathered and used in the study. In Part I of the study, Donders (2001a) found that most neuropsychologists included information related to who referred the client, what information the referring provider was seeking, and a clinical description of the patient. In the testing sections, most neuropsychologists included a list of tests administered, as well as descriptive terms (e.g., average, above average) when describing performance. There was considerable variability in whether and how normative systems (e.g., T-scores, standard scores) were described or explained in the report. Those who did provide explanations often worked mostly with pediatric populations and/or were board-certified practitioners (Donders, 2001a). Another study revealed significant variation among board-certified neuropsychologists in how standard scores in the lower ranges of functioning were classified, where standard scores received between 6-23 different qualitative descriptive terms (e.g., below average), and they suggested that neuropsychologists work toward a more uniform description and classification of scores (Guilmette et al., 2008). Guilmette and colleagues were primarily focused on qualitative descriptors used across reports, and they also used a survey distributed via professional listservs to obtain 227 neuropsychologist participants. The focus of the survey was the use of various qualitative descriptors.

In Part II of Donders' (2001b) study, more specific characteristics of the reports were examined (Donders, 2001b). The author found that most neuropsychologists included numbers within their reports. Specifically, reports included standard scores and percentile ranks rather than age- and grade-equivalents in reports. Test result narratives typically were organized in sections either by test or skill area. Some neuropsychologists did not discuss every test

administered, and reports that did include every test were, unsurprisingly, much longer. The author stated that after examining several factors (e.g., employment setting, reimbursement), no meaningful relationships emerged to explain why some did not discuss every test. A majority of reports addressed the referral questions in the summary section. With respect to recommendations, these were generally included in a separate section, with significant variability on whether they were written as narrative descriptions or itemized lists, even for the same neuropsychologist (Donders, 2001b).

Overall, the median length of reports was six pages, although this varied widely (Donders, 2001b). Employment setting was related to the length of the report, with longer reports being found in private practice settings and shorter reports in medical settings. Further, pediatric reports were generally the longest (Donders, 2001b). The author suggested that longer pediatric reports may be related to factors such as a need for more detailed explanations and client/patient backgrounds to answer diagnostic questions seen in pediatric populations. Postal and colleagues (2018) found similar variation in report lengths, with an average length of eleven pages for pediatric, seven for adult, and six for geriatric populations. Similar to Donders' study, Postal and colleagues also used a survey method to collect participant data, but they also included referral sources in addition to neuropsychologists. Participants were recruited through emailing members of professional listservs and membership in relevant LinkedIn groups (e.g., University of Florida College of Public Health and Health Professions). These authors contained a considerably larger sample with 726 neuropsychologists and 434 medical referral sources. Findings also indicated variation in turn-around time for neuropsychological reports, with an average of over three weeks for pediatric, 2-4 weeks for adult, and under two weeks for geriatric populations (Postal et al., 2018). These researchers also found that pediatric reports most often took between 5-20

hours to write, which is consistent with previous findings, and pediatric reports are often the longest. Adult and geriatric reports were most often involved less than two hours of writing time.

Participants of the Donders (2001b) study reported that they never changed their reports for the audience (e.g., doctors, patients, schools). Furthermore, 61.84% of neuropsychologists reported they only occasionally provided a written report to patients and families. There was also significant variation in whether the report was reviewed with the patient and/or family before sending it to them. When this did occur, it was most often in pediatric populations (Donders, 2001b).

In sum, neuropsychological reports follow a similar format to other psychological reports, with major sections related to the reason for referral, history, test results, impressions, and recommendations. There is significant variation across the length of reports, with pediatric reports being the longest. There is also variation in how scores are included in reports (e.g., in narrative, appendix), but most include the scores. Finally, reports varied in whether testing results were discussed in thematic or test-by-test formats.

Regarding the state of the research, most researchers focused on neuropsychological report writing utilized survey methods specific to neuropsychologists with professional association memberships. Given that these surveyed samples are not necessarily representative of all neuropsychologists, conclusions of the broad practice of neuropsychological report-writing may be limited. Furthermore, the use of surveys limits what can be said about concerns such as the readability of reports. Specifically, analyses are limited to characteristics such as page length and numbers and do not include analyses of characteristics that may be more related to report quality, and results may be skewed by neuropsychologists' views of their reports given the subjective nature of responses. It would be helpful to see broader methods of sampling outside of

professional association memberships as well as methods in addition to surveys to examine reports more closely (e.g., report samples).

Report Perceptions and Satisfaction

Overall, research on satisfaction with assessment services has been positive. Bennett-Levy and colleagues (1994) found that neuropsychological assessments were viewed as overall positive by readers. Similarly, Allott and colleagues (2011) reported that referral sources are generally satisfied with neuropsychological reports and that they found them helpful. Specifically, reports assisted with access to appropriate services. Most participants that indicated dissatisfaction were specific to the long waitlist for services, rather than the report itself. Recommendations and cognitive strengths and weaknesses were cited as the two most helpful components by referral sources. To sum, readers are generally satisfied with neuropsychological reports, although there appears to be some variation satisfaction by specific readers.

In the report-writing literature, perceptions of the reports have been measured in several ways, including satisfaction, preferences, and usefulness. Many researchers surveyed satisfaction with the report received. Findings from preference-related studies have indicated specific recommendations, including which characteristics and formats were favored by individuals surveyed across these studies. Finally, many researchers discussed perceptions of usefulness, which broadly is related to the help provided by the report and its subsequent effects on outcome (Bodin et al., 2007). The dimensions of satisfaction, preferences, and usefulness provide a framework for this review of the report perception literature.

Reports for Parents

Parents have an important role in implementing the recommendations provided in reports (Mastoras et al., 2018), so it is important to ensure they are satisfied with, and can understand,

the report. Interestingly, one study found that although feedback given directly to the neuropsychologists by patients and families was positive, feedback given indirectly via referral sources (e.g., physicians) was less so, describing unhelpful recommendations and difficulty in understanding the report for families (Postal et al., 2018). Thus, the findings below should be interpreted in light of this, as other studies generally gathered direct feedback. Nonetheless, several areas of concern have been noted by parents across studies, even with direct feedback.

Many researchers have found that parents reported difficulty in understanding psychological and psychoeducational assessment reports overall (Hite, 2017; Rahill, 2018; Tharinger et al., 2008). Tharinger and colleagues (2008) noted that traditional psychological reports (i.e., technical, high reading level) are less helpful to parents because of jargon and that they do not succinctly address parent concerns. Another study found that jargon significantly impacted parents' ability to remember the information in psychoeducational reports (Bucknavage, 2007). In another survey, 100% of parents stated that reports contained too much jargon, and only 19% said that psychoeducational reports were written in a way that was easy for them to understand (Rahill, 2018). Although there are few studies in this area, they have found that reports often contain too much jargon and are too difficult for parents to understand.

Some researchers have found that parents are satisfied with the understanding of their child following the report. Studies of neuropsychological reports have found that parents report a better knowledge and understanding of their child, their condition, and their needs after reading the report (Austin et al., 2019; Farmer & Brazeal, 1998). Farmer and Brazeal (1998) used a survey method to recruit parents of children receiving neuropsychological evaluations within the hospital setting. Austin and colleagues (2019) conducted a longitudinal study surveying self-reported satisfaction and understanding beginning at the outset of the assessment process to

several weeks after the feedback session. However, one study revealed an interesting phenomenon in which education was negatively related to satisfaction with a neuropsychological consultation when using an interview method to collect satisfaction-related data four months after the conclusion of the evaluation (Kirkwood et al., 2017). Another group of researchers described similar results (Bodin et al., 2007). However, the majority of parents still reported high levels of overall satisfaction with the consultation. The authors hypothesize that this may be related to higher expectations. Other studies did not examine this connection. Parents also found that psychoeducational reports increased their understanding of their child and his/her needs (Nugent et al., 2014). Another study of psychological assessments noted that parents viewed diagnosis as a strength to access services (Pei et al., 2011). Thus, most researchers reported that parents' understanding of their children improved following reading the reports, although parents with high levels of education may experience slightly lower levels of satisfaction.

Apart from understanding, some researchers also have studied satisfaction related to the effects of neuropsychological reports for their children. One study found positive effects, including improvements in school services following assessment services, where parents reported high satisfaction with the assessment services and ranked the report as the most helpful aspect, when compared to time spent with the professional and the feedback session (Farmer & Brazeal, 1998). Another study specific to neuropsychological consultation for post-concussive symptoms found that a majority of parents were generally satisfied with the neuropsychologists' provision of help (Kirkwood et al., 2017). Interestingly, Bodin and colleagues (2007) found that parents were satisfied with the neuropsychological evaluations; however, the services were not as helpful as they originally anticipated. The reason for this disconnect is unclear.

One study yielded quite negative results related to satisfaction of psychoeducational reports (Rahill, 2018). In this survey, only 17% of parents said they were satisfied with the report. A majority of parents also rated the report as unreadable, said that it did not adequately answer the referral question, said it did not answer questions about cognitive or behavioral functioning, and said it did not adequately discuss strengths and weaknesses. A notable difference between this study and those previously reviewed may be related to the profession. Most studies examining satisfaction were not targeting school psychologists' reports, rather they focused on neuropsychologists and clinical psychologists, whereas studies conducted by Rahill (2018), and Nugent and colleagues (2014) examined school psychologists' reports.

Furthermore, although the findings of the Rahill study noted that many reports were unreadable, psychoeducational reports in the Nugent and colleagues' study were deemed generally readable by their participants, as compared to findings from Rahill. It may be that the sample of reports in Rahill's study was particularly difficult for parents to understand, and this greatly affected their satisfaction. To sum, a majority of parents indicated that the reports they received were helpful, and they were mostly satisfied, but this may be sensitive to readability. Readability studies were only found for psychological and psychoeducational reports, and nearly all studies found reports were difficult to read. Further, studies related to neuropsychological and psychological reports generally reported satisfaction with services, whereas satisfaction with psychoeducational reports was more variable.

Some researchers have detailed the specific preferences and suggestions that parents noted following the reading of their report. These were relevant across psychological, psychoeducational, and neuropsychological reports. With regard to the recommendations, one review article across studies related to report-writing and oral feedbacks described those parents

appreciated concrete suggestions that can be done at home (Tharinger et al., 2008). A survey study of 118 parents noted that parents preferred recommendations to be clearly and concretely written (Farmer & Brazeal, 1998). In psychological reports for children referred for Attention-Deficit/Hyperactivity Disorder evaluations, results through a standardized adherence interview indicated that the 95 parents were the most likely to comply with recommendations to visit professionals outside of psychology (e.g., medical professionals) as well as self-help recommendations (Dreyer et al., 2010). In contrast, they were least likely to follow through on recommendations for psychological services. When compared to traditional, technical report formats, parents preferred a consumer-focused report, which had a lowered reading grade level and integrated, thematic testing results sections (Hite, 2017). This consumer-focused format also was rated as more useful and usable by parents. Hite's (2017) study was conducted with 153 parents who read a traditional and consumer-focused report on a fictional child, and then rated their understanding and utility with a questionnaire developed by the researcher.

It should be noted that many individuals often also receive an oral explanation of the report and testing results (i.e., oral feedback; Postal et al., 2018). Some researchers also described conducting and questioning related to feedback procedures within their study, but included assessment reports and feedbacks together, sometimes referring to both as forms of feedback (Allott et al., 2011; Bennett-Levy et al., 1994; Bodin et al., 2007; Dreyer et al., 2010; Farmer & Brazeal, 1998; Nugent et al., 2014). Other researchers described procedures that separated feedback sessions from the overall report process by asking questions specific to each (Austin et al., 2019; Bodin et al., 2007; Kirkwood et al., 2017; Postal et al., 2018). Findings related to satisfaction discussed above do not appear to vary by the inclusion of a feedback session, but this is unclear given the lack of specific differentiation between reports and

feedbacks in some studies. Receipt and quality of oral feedback may skew perceptions of written reports. Therefore, findings on satisfaction with services and perceptions may be interpreted in light of this.

In summary, parents often reported problems with understanding the reports they received as well as excessive jargon. Despite high reading levels, reports still appeared to be helpful for parents, who reported increased understanding and positive impacts of reports. In general, parents would prefer recommendations to be clearer and more feasible for the home. Many of the researchers mentioned above also utilized survey methods to gain information related to satisfaction, usefulness, and preferences. While this appears common when assessing usefulness of reports, it could limit the amount and scope of information that one can gain from participants. It would be helpful to shift research methods to more interview-based methods (Dreyer et al., 2010; Kirkwood et al., 2017) to have a more complete view of experiences with reading reports and implementing their suggestions. Survey-based methods also may be expanded to gather more in-depth information from report consumers.

Reports for Teachers

Teachers are another prominent group of report readers, and there is a wealth of studies examining issues related to teacher understanding, satisfaction, and perceptions. Although teachers will not be surveyed in this dissertation, findings on teacher perceptions are reviewed given the wealth of literature related to report experiences among teachers. It should be noted that these studies are most often related to psychoeducational reports written by school psychologists as teachers are generally the main readers of such reports (Mastoras et al., 2011).

Concerning understanding and readability, teachers appear to be affected by the level of jargon included in the report across psychological, neuropsychological, and psychoeducational

focuses (Cheramie et al., 2007; Fletcher et al., 2015; Keenan et al., 2019; Lindelauf et al., 2018; Nugent et al., 2014; Pelco et al., 2009; Umaña et al., 2019; Wiese et al., 1986). When examining psychoeducational reports, jargon affects teachers' ability to apply the findings of the report to their classroom (Lindelauf et al., 2018) and to perceive the report as useful (Cheramie et al., 2007). Further, although long-career teachers may be somewhat less affected by jargon, possibly due to more exposure to the jargon throughout their teaching careers (Umaña et al., 2019), jargon still affects teachers' understanding at all teaching levels (Fletcher et al., 2015). Teachers were more satisfied with reports written with less jargon (Fletcher et al., 2015), and they strongly preferred reports to be written with less jargon and technical language (Fletcher et al., 2015; Umaña et al., 2019). In contrast, Nugent and colleagues (2014) reported substantially fewer teachers finding reports difficult to understand, where the reports sampled in this study appeared to be more readable than other psychoeducational reports across most other studies.

In terms of psychological reports, one study was focused on the effects of jargon. Pelco and colleagues (2009) provided 104 elementary school teachers with models of reports that were theme-based or test-by-test based and had either high or low levels of jargon. Teachers were then asked about their satisfaction and understanding, as well as describe their interpretation of the difficulties in the model reports and offer possible interventions based on the model reports. Results indicated that jargon affected teachers' ability to generate their own appropriate interventions based on the report findings (Pelco et al., 2009). Another study found that comprehension and readability were affected by levels of jargon, but usefulness, relevance to educational setting, and descriptions of students were not (Wiese et al., 1986). The authors proposed several possible explanations, such as past experience with reports and jargon, skimming reports because they do not understand, or presence of high-quality report

characteristics (e.g., logical conclusions, organized format) leading to less critical views of the report. Finally, only one study was found on neuropsychological reports and jargon for teachers, which noted that jargon affected perceptions of report usefulness (Keenan et al., 2019). Given these findings, it appears that although jargon affects teachers to varying degrees based on several factors, most teachers' understanding of reports is compromised to some extent by higher levels of complicated language across professions.

In terms of teachers' satisfaction and usefulness, results were quite varied, but all three of these studies were conducted with psychoeducational reports only. One study found that the level of complexity of reports led most teachers to avoid reading them and reporting much lower satisfaction with reports (Rahill, 2018). In contrast, another study found that a majority of teachers stated they read the entire report carefully, and they reported much higher levels of satisfaction and readability (Nugent et al., 2014). In another study there was no difference in perceptions of the report whether written by a private practice psychologist or one employed by the school district (Cheramie et al., 2007). The variation in satisfaction, once again, appears to be strongly related to the readability of the report, with more readable reports garnering higher levels of satisfaction among teachers. Studies further break down teacher satisfaction with reports by the information discussed below.

Many teachers indicated that the reports helped them understand their students when reading psychoeducational (Lindelauf et al., 2018; Nugent et al., 2014) and psychological reports (Pei et al., 2011). School personnel (teachers, administrators, and allied professionals) viewed diagnosis received as a guide to inform their work with the student (Pei et al., 2011), and teachers viewed reports as a primary agent in acquiring additional funding and services (Lindelauf et al., 2018). Another survey found that most teachers felt their psychoeducational

reports adequately described students, and it helped them better understand the child (Nugent et al., 2014). Teachers also indicated that the results and background sections helped inform their planning (Lindelauf et al., 2018). So, it seems that all studies reported satisfaction with the picture painted of the student, although there are relatively fewer studies in this area, and no neuropsychological reports were found in this area.

Many more studies examined teachers' satisfaction with the recommendations provided within the report. When examining psychoeducational reports, significant problems are reported with the recommendations. Specifically, some teachers described recommendations as impractical, lacking utility, too few, and lacking in concreteness for application (Hagborg & Aiello-Coultier, 1994). Another study found similar results, stating that 88% of teachers did not feel that recommendations provided helpful information for instructional planning and Individualized Education Plan (IEP) development, and 55% did not find that reports contained helpful information for designing interventions (Rahill, 2018). Teachers also complained that it was difficult to translate assessment data (e.g., testing results) into actual classroom strategies, and they would benefit from a clearer connection between findings and translation into classroom strategies (Rahill, 2018). Another study found poor follow-through in recommendations for remediation, with the best follow-through in content-related (e.g., academic subjects) rather than ability-related (e.g., problem-solving, attention, language) areas (D'Amato & Dean, 1987). The authors proposed this may be because teachers are often most familiar with these academic content areas, and ineffective communication in written reports may affect follow-through with less familiar areas (e.g., ability-related areas). One study found on neuropsychological reports indicated that teachers described recommendations as vague and

hard to understand, with several systematic (i.e., resource-based) barriers to implementing the recommendations, and they would prefer more practical recommendations (Keenan et al., 2019).

While most studies across disciplines found that recommendations were not as helpful or as practical as they would like, one study found more positive responses to recommendations, stating that teachers used information provided in psychoeducational reports to inform their teaching (Lindelauf et al., 2018). Teachers in this study valued the recommendation section of the report, and these were used to develop interventions and adapt teaching. Reports also were used in conjunction with other information gathered about the student generally (e.g., teachers' experiences with the student). Similarly, another study found the recommendations, along with the summary, to be useful (Nugent et al., 2014). Some teachers did note preferring more open-ended, general recommendations to allow them flexibility in implementation (Lindelauf et al., 2018), although it appears a majority of teachers would prefer specificity (e.g., Brenner, 2003; Groth-Marnat, 2009; Harvey, 2006; Umaña et al., 2019).

Overall, teachers benefitted from the descriptions of the student (e.g., diagnoses, results). However, recommendations were generally lacking and would benefit from more adjustments. When considering variability among findings, Lindelauf and colleagues (2018) and Nugent and colleagues (2014) were the only researchers that reported positive responses to recommendations. The Lindelauf study was conducted with school psychologists in Australia, and Nugent and colleagues' work focused on Irish psychoeducational reports. The ones reporting dissatisfaction were largely conducted on psychoeducational reports within the United States (D'Amato & Dean, 1987; Hagborg & Aiello-Coultier, 1994; Rahill, 2018), as well as one study in Ireland with neuropsychologists (Keenan et al., 2019). Australia and Ireland may have better report writing practice standards for their school psychologists, and this may contribute to some

discrepancy between preferences reports by teachers. Further, as described above, reports in the Nugent study often were more readable, which may have led to more positive perceptions. Therefore, readability, again, appears to be related to views of reports.

It is important to understand teacher preferences, perceptions, and understanding of reports to ensure students receive adequate care (Umaña et al., 2019). Teachers preferred that psychologists minimize jargon and use more definitions, descriptions, or examples (Umaña et al., 2019). Studies also asserted several suggestions for format changes. New teachers and special education teachers preferred theme-based, non-technical reports to traditional psychoeducational reports, and they found them more useful (Fletcher et al., 2015; Umaña et al., 2019). In contrast, experienced teachers found test-by-test formats more useful, possibly because of previous exposure to these more traditional formats. Teachers also preferred interpretive/descriptive terms over scores, and they may actually favor longer reports that provide more details and answer referral questions, provided it includes more descriptive, detailed, and specific information (Umaña et al., 2019).

In terms of recommendations, teachers preferred specific and detailed recommendations (Umaña et al., 2019). Further, recommendations were more likely to be implemented if they were specific, detailed, practical, and easy to implement (Lindelauf et al., 2018; Umaña et al., 2019). Teachers also preferred recommendations written in behavioral terms and with explanations and examples, so longer recommendations may be appropriate (Umaña et al., 2019). However, one study did note that teachers preferred more open-ended recommendations, specifically to allow them flexibility in implementation (Lindelauf et al., 2018). Again, geographical variability in studies may contribute to these researchers finding different preferences among its teachers. It should be noted that all of these suggestions are proposed by

studies specific to psychoeducational reports, and other professions should conduct studies on report preferences and suggestions to gain better understanding of how psychologists and neuropsychologists can improve their reports.

In conclusion, teachers reported significant difficulty with understanding reports, and many did not find the recommendations provided to be helpful. However, they were generally satisfied with the clinical descriptions (i.e., summaries) of their students. Teachers preferred recommendations that are clearer, concrete, and practical, and they preferred reports written at a more understandable reading level. A consideration in interpreting the results of the above studies is the amount of the report that was read. Many teachers admitted that they did not read the entire report, or they read only the summary and recommendations sections (Keenan et al., 2019; Rahill, 2018; Zins & Barnett, 1986). In contrast, Nugent and colleagues (2014) found that teachers read the entire report carefully, but geographical variability and more positive views of readability in this study may be contributing to these discrepant findings. Thus, this should be considered when interpreting teachers' results of understanding and satisfaction. It also should be noted that a majority of the studies cited in the parent and teacher sections are based upon school psychologists' psychoeducational reports, so there is less information about how parents and teachers respond to neuropsychological reports specifically. There is also a dearth of research that examines the differences in preferences between parents and teachers of the same report to inform how different styles may be more or less beneficial for different audiences. These are both areas for further research.

Reports for Physicians

Although the current study did not include physicians, a large number of studies related to satisfaction and preferences for neuropsychological reports are conducted with physicians.

Therefore, physician perceptions are briefly reviewed. All studies within this section are specific to neuropsychological reports. Most often patients are referred for a neuropsychological evaluation by physicians to establish or confirm a diagnosis (Temple et al., 2006). Overall, physicians and referring providers were highly satisfied with assessment services and reports (Mahoney et al., 2017; Temple et al., 2006; Tremont et al., 2002), and most physicians found reports useful (Tremont et al., 2002). Physicians generally agreed with the findings and impressions of the evaluation (Temple et al., 2006; Tremont et al., 2002), and they found the diagnoses, summary, and recommendations sections the most helpful (Postal et al., 2018). Physicians generally found recommendations useful and satisfying (Temple et al., 2006) and agreed with them (Mahoney et al., 2017), but they preferred behavioral, rather than medical, recommendations (Temple et al., 2006), as well as more specific recommendations presented in a succinct fashion to avoid overwhelming families (Postal et al., 2018)

Physicians generally reported moderate effectiveness in the written communication of the report (Mahoney et al., 2017; Postal et al., 2018). However, physicians felt that the writing was geared towards them and not the patients, and physicians did not find the history, behavioral observations, or emotional sections of reports helpful (Postal et al., 2018). Most physicians reported reading the entire report, although the background section was the one most often skipped when not read entirely (Mahoney et al., 2017). Unfortunately, 73% of referral sources reported that slow turnaround time negatively impacted their patients (Postal et al., 2018). It should be noted that there has been little evaluation of readability among physicians who receive psychological/neuropsychological reports, and further research may be warranted in this area.

Concerning preferences, many physicians preferred reports to include bulleted sections (Mahoney et al., 2017; Postal et al., 2018), as well as shorter report length and turn-around time

overall (Mahoney et al., 2017). Most also found the inclusion of scores in the report helpful (Postal et al., 2018). Many would prefer less jargon and a better explanation of any technical terms included (Postal et al., 2018). Finally, most physicians reported wanting neuropsychologists to provide in-person feedback to the patients (Postal et al., 2018).

In general, physicians were satisfied with the reports they receive from neuropsychologists. The main complaints appeared to be related to the efficiency with the completion of the report. Specifically, physicians would prefer shorter reports, as well as shorter wait times to receive the final reports.

Health Literacy

Previous report research revealed difficulties with understanding/jargon of reports and implementing recommendations based on how they were written (e.g., abstract, difficult to understand). Difficulties in understanding and using reports have implications for the health literacy of individuals and their families. Health literacy is defined as one's ability to understand their health information to inform decisions (Ratzan & Parker, 2000). The problems with readability are not unique to reports, and many health-related materials are difficult to understand for a large proportion of American adults, making it difficult to act upon the information they received from their healthcare providers (Nielsen-Bohlman et al., 2004). Many American adults are unable to read complex texts, and yet much of the health-related information is provided in this format. Limited literacy also impacts access to health information (Rudd et al., 2000).

It is important to understand the reading level of most adults to understand the appropriate writing level of reports. The National Adult Literacy Survey (Kirsch, Jungeblut, Jenkins, & Kolstad, 2002) was a large-scale study that sought to examine the general reading levels of adults in the United States. Of the 191,289 individuals who took part in this study, the

majority were Caucasian, with oversampling of African American and Hispanic individuals to resemble the American population distribution more closely. Ages ranged from 16 to over 65, and there was a roughly even gender split. The authors indicated that there was a wide range of socioeconomic status, assessed by parent level of education, and there was a sub-sample of participants from a prison population. Despite the wide range of education and SES represented, the authors found that 21-23% of American adults fell into the lowest of five levels of literacy, which entails reading at the simplest and shortest prose. Adults reading at the lowest level were not specific to any one demographic group, and they were able to function independently. Another 25-28% of adults fell into the next highest reading level, which involves slightly more complex prose than the first level and only basic inferential abilities. These two levels account for about half of the population sample, and these individuals in the two lowest reading levels generally had problems with comprehending more challenging texts written at higher reading levels. This has important implications for health literacy, including in the context of reports. That is, about half of the adult population might not be able to understand psychological reports.

However, health literacy is affected by factors beyond literacy skills of the individual, as even individuals with higher levels of education and reading levels struggle to actively engage with their medical information (National Action Plan to Improve Health Literacy, 2010). Furthermore, health literacy is affected by systematic efforts to ensure patient understanding and the provision of actionable information (National Action Plan to Improve Health Literacy, 2010), which has contributed to some researchers proposing organization-based models to improve information delivery (Koh et al., 2013). In addition to general literacy, health literacy requires additional skills and knowledge, including more specific knowledge related to anatomy, behaviors, and systemic knowledge as it pertains to one's health (National Action Plan to

Improve Health Literacy, 2010). Additionally, communication skills, listening skills, and demographic factors (e.g., language, socioeconomic status) interact with literacy and knowledge to influence an individual's ability to effectively communicate and engage with their health information (National Action Plan to Improve Health Literacy, 2010). Given these factors, there have been some suggestions in the literature aimed at improving health literacy.

According to one study, patients may absorb information more effectively when some time has passed since the initial diagnosis (Abou-Diab et al., 2019). Although the authors did not provide an explanation for why patients may absorb information better, I suggest it may be related to factors such as shock from the initial diagnosis or the amount of information provided in the appointment with the diagnosis. However, the authors of the study noted that patients no longer have access to the professional to explain information following the initial diagnosis (Abou-Diab et al., 2019). For psychological and neuropsychological evaluations, they may have the report to answer additional questions. However, given that many found the report difficult to understand (e.g., Rahill, 2018), this may offer little support in making decisions.

The National Action Plan to Improve Health Literacy (2010) noted that the responsibility is placed on health professionals to effectively communicate health-related information. They asserted that professionals must provide information in a clear, plain language, and easy-to-understand manner that is usable for decision-making. They also stated that there is a considerable discrepancy between the knowledge of the professional and what is understood by the consumer. The implications for the lack of understanding of health materials are important, as individuals have the responsibility of making health-related decisions independently while navigating complex information that may not have been clearly discussed with the provider.

With these concerns in mind, the Centers for Disease Control (2009) published guidelines to improve communication with the general public when discussing medical information. Specifically, the CDC recommended: (a) considering your audience, (b) listing key points first, (c) avoiding overly lengthy explanations, (d) avoiding too many messages in one context,(e) providing actionable recommendations,(f) presenting information in an easy-to-understand format, (g) avoiding jargon, (h) avoiding abbreviations, (i) avoiding acronyms, (j) avoiding statistics,(k) reducing the reading grade level, and (l) testing the readability of documents to adjust, as necessary. Using these recommendations can help to make health information more accessible to the general population. Thus, guidelines can be used to both for making medical information including psychological reports more readable for individuals.

It should be noted that no studies were found related to health literacy and its relationship to reports. Nonetheless, reports may be considered health documents, and it may be prudent to consider their effects on health literacy, as well as how one's health literacy affects their ability to understand and utilize psychological and neuropsychological reports. This specific connection should be studied further to fully understand the effects it has on individuals.

Readability

Given the potential literacy related issues noted in the previous section, it is important to further discuss the concept of readability in the context of psychological reports. Some researchers have objectively assessed the readability of reports. Report readability may be compared to the average reading grade level of adults (i.e., approximately eighth to ninth grade for most adults; Safeer & Keenan, 2005). Unfortunately, more recent literature on average adult reading level could not be found.

Calculation of Readability

Before discussing the readability of reports, a brief overview of the calculation of readability is warranted. Several formulas are available, and they have several common, underlying criteria. Lenzner (2014) provided a review of the major components of the formulas. One component of readability is word length, which can be characterized as either the average number of syllables per word or the number of words consisting of three syllables or more. Another major component is word frequency; specifically, the number of rarer or low-frequency words for the country. Sentence length is the final major component.

Three common formulas are discussed throughout the readability literature: the Flesch-Kincaid formulas (Flesch, 1948; Kincaid et al., 1975), the Gunning-Fog Index (Gunning, 1952), and the Dale-Chall formula (Chall & Dale, 1995). Others are available, but these appear to be the most discussed in the studies reviewed. The Flesch-Kincaid includes two formulas: the Flesch-Kincaid grade-level and Flesch-Kincaid reading ease. The formulas are based on the total number of words in a sentence and total syllables per word (for a review, see Zhou et al., 2017). Whereas these formulas are commensurate with subjective feelings about the ease of a reading passage (Quereshi, 1991), they are not predictive of text processing speed (Crossley et al., 2017).

The Gunning-Fog Index considers the total number of words per sentence and number of syllables in words, similar to the Flesch-Kincaid formula, but it also includes the number of complex words as defined by a list of the 3,000 most familiar words (for a review, see Zhou et al., 2017). However, one study found that reading grade levels calculated by Gunning Fog were always higher than those calculated by other formulas (Zhou et al., 2017).

Finally, the Dale-Chall formula is based on the sentence lengths and number of words not found on a list of common words (for a review, see Crossly et al., 2017). This formula is

generally a stronger predictor of text processing speed when compared to the Flesch-Kincaid formulas (Crossley et al., 2017). Another study found this formula to be better at predicting reading grade level when compared to other commonly used formulas (Begeny & Greene, 2014).

It is important to note that these readability formulas have specific limitations in their validity. Readability formulas do not account for important text or reader factors (e.g., content, format, background knowledge, individual differences among readers, organization), which has been a concern for many years (e.g., Anderson & Davison, 1986; Redish, 2000). Further, many traditional readability formulas are relatively weak indicators of actual text comprehension, text processing speed, and familiarity (Crossley et al., 2017). There is also significant variability between the formulas, and they can provide different readability scores for the same passage, sometimes by more than an entire grade level (e.g., Janan & Wray, 2014; Lenzner, 2014; Zhou et al., 2017). They also rely on only a few aspects of a text to calculate scores, and they are often too simplistic to adequately capture readability (e.g., Janan & Wray, 2014; Lenzner, 2014). Redish (2000) also noted that using readability formulas to rewrite passages may cause problems, as the lack of precision may not address the components that are rendering the text difficult to read. Zhou and colleagues (2017) concluded that despite these concerns, they still recommend that one use readability formulas to estimate readability. Readability scores should not, however, be considered precise calculations. Further, because many have similar issues, no one formula seems to stand out above the rest.

Zamanian and Heydari (2012) reviewed the pros and cons of readability formulas for consideration. They noted that readability formulas are quick, efficient estimates of grade level needed to understand a text; easy to calculate; and useful in lowering reading levels of difficult texts. In contrast, they do not give an estimate of how well an audience understands the text;

there is significant variability among formulas; and the criteria used in these formulas may not fully capture text difficulty.

To sum, there are many formulas to choose from, but each has problems, and they are only starting points for assessing reading difficulty. Studies utilizing readability formulas discussed below should be interpreted in light of this. There is also a lack of clear guidance on which of these formulas should be used when calculating the readability of a given text, and there appears to be more research needed on, and/or refinement of, these formulas.

Readability of Reports

After this more general consideration of readability, I turn to analyses of the readability of psychological and neuropsychological reports. Studies reviewed previously highlighted significant problems with jargon and understanding. Many researchers have identified difficult readability as a common complaint about psychological reports (for a review, see Groth-Marnat & Horvath, 2006). Reports from all professions are often written at a reading grade level that is above what is expected for the general population (Baum et al., 2018; Harvey, 1997; Singh et al., 2009), with studies reporting between 11th and 15th grade across psychological, neuropsychological, and psychoeducational reports (Baum et al., 2018; Harvey, 1997; Jones & Gross, 1959; Singh et al., 2009; Weddig, 1984). Therefore, they are in danger of being misunderstood or ignored (Harvey, 1997). It may be assumed that other professionals are the primary audience, or professionals are writing in line with their own level of education, which is often higher than the public (Harvey, 1997). However, studies of neuropsychological and psychological reports have found that reports are often too difficult to understand, even by other psychologists and mental health professionals (Brenner, 2003; Schoenberg et al., 2018).

In studies of attempts to improve readability and lower reading levels of reports, results were generally positive. Weddig (1984) compared modified psychoeducational reports, written at the 6th-grade level, to traditional reports, written at the 15th-grade level. The author gathered 50 psychological reports randomly from the special education files in a school and gathered information related to the reading level of the report, name of the writer, placement recommendations for the student, and date of report completion. A single report from the original 50 was selected as the traditional report model based on specific criteria (i.e., median reading level, time written, special education placement was recommended). The representative traditional report was then modified to lower the reading level to sixth grade, shortened to half of the original length, and reduced the amount of jargon. The report was then reviewed by a panel of experts in psychoeducational report utilization and special education planning to ensure that the report was still adequate. Parents (n = 114) were then surveyed on each of the two reports using a measure, constructed by the researcher, which assessed readability and overall effectiveness in communicating the findings. Following these procedures, the researcher found that the lower reading grade level reports were interpreted more accurately by parents. Another article reported that when examining shorter, simplified, focused neuropsychological reports (assessed through objective measures of readability and report characteristics), referral sources preferred these formats, and they were rated as useful by school intervention coordinators (Baum et al., 2018). This study exclusively sampled reports within the Cincinnati Children's Hospital Medical Center as part of an initiative to gather data related to the effectiveness of their reports. Archived medical record review was used to sample reports to yield a total of 240 reports. Reports were assessed for Flesch-Kincaid readability, percentage of the report utilized for impressions and recommendations, and chart examination to assess for changes in patient

outcome (e.g., billing changes, case flow). Subjective measures of quality were also conducted, which were assessed through questionnaires given to experts (i.e., school intervention coordinators) based on effectively communicating evaluation findings and provided recommendations. Based on these findings, the authors pointed out that the quality of reports is still high even for reports with more simplified formats.

It appears that the readability of reports is far above the average reading grade level of the adult United States population. This readability discrepancy leads to significant problems with the understanding of reports, which may subsequently impact patient comprehension, follow-through, and other important decisions. Studies examining reports written at lower reading levels have generally yielded positive effects. Thus, lowering reading grade levels may be a positive change to report writing. However, all studies used objective readability formulas which have many limitations, as discussed above. Therefore, findings related to readability formulas should be interpreted with caution. However, this is ameliorated by the inclusion of outside measures of understanding and readability such as parent self-reports.

Other Common Problems of Reports

Research has revealed several common complaints across psychological, neuropsychological, and psychoeducational reports (e.g., Rahill et al., 2018). Despite extensive findings regarding report quality, many of these problems have not changed significantly over time. Furthermore, there is substantial variation in how psychologists choose to write reports (Mayman, 1959). This section is a review of other specific report writing issues.

Length

Many researchers have found that reports are too lengthy for readers (e.g., Baum et al., 2018; Bennett-Levy et al., 1994; Mastoras et al., 2011), with report length increasing steadily

over time (Sweet et al., 2015), and this can be frustrating and tiring for report readers (Bennett-Levy et al., 1994). Several factors have affected the length of the reports, including the goal of the evaluation, stamina/health of the examinee, and age of the examinee (Sweet et al., 2015). Thus, Seagull (1978) suggested that one be clear about the purposes of the assessment to determine what information is relevant. Some suggested that many reports are far too comprehensive to be useful (Allott et al., 2011; Tharinger et al., 2008). Some report-writing scholars have suggested that the least information necessary should be given, with only information germane to the purposes of the report being included (e.g., Evans et al., 2019; Zimmerman & Jucks, 1983). One is encouraged to differentiate between essential information and information that is irrelevant but interesting (Zimmerman & Jucks, 1983). However, one study noted that length did not affect the recall of report information, which is more related to jargon and format (Bucknavage, 2007). All other experimental studies discussed in this section were on neuropsychological reports specifically while Bucknavage focused on psychoeducational reports, which may account for the discrepant finding. Nonetheless, the majority of studies indicated that reports are lengthier than necessary, often citing the inclusion of unnecessary information. However, no clear guidance has been found related to the ideal page length of reports and this should be researched further.

Writing Time

Some researchers have criticized the length of time that it takes to receive a completed report. Reports have been described as time-consuming to write, and this diverts from the professional's time to be available to provide more direct services (Harvey, 2006). The utility of the extensive time spent writing reports has been questioned (Zimmerman & Jucks, 1983), as well as concerns over lack of resources to spend such a large amount of time writing (Harvey,

2006). Postal and colleagues (2018) reported that few neuropsychologists believe that referral sources read the entire report, yet they spend considerable time writing sections that they believed will never be fully read. The authors also discussed that neuropsychologists may often feel that reducing the time spent on reports will reduce the quality. However, the authors stated that this assumption is incorrect and referring providers noted that the time taken to receive the report negatively impacted their patients while referral sources still found shorter reports to be helpful. Thus, quicker writing time has many benefits, as it may minimize the potential for communication errors and misunderstanding of reports (Schoenberg et al., 2018), provide an earlier diagnosis (Pei et al., 2011), and allow for faster receipt of interventions (Pei et al., 2011; Seagull, 1978).

The time spent on reports also affected insurance reimbursement, as there are limits on billing for report-writing hours (Baum et al., 2018). These reimbursement restrictions can cause difficulties for neuropsychologists, and it has led to lower incomes despite increases in client hours (Sweet et al., 2003) with less compensation for hours worked (Kanauss et al., 2005). This billing imbalance may affect the referrals that neuropsychologists take on, opting to take referrals for which services have a better chance of being reimbursed (Kanauss et al., 2005).

In sum, there are a myriad of negative effects that come with the length of time it takes to complete a report. These affect both the client, as well as the neuropsychologist. Fewer hours spent writing has the potential to increase both client satisfaction and opportunities for interventions, as well as the psychologist's or neuropsychologist's reimbursement.

Assessment Batteries

Although fewer in number, some researchers have criticized the choices of assessment batteries. One researcher criticized how, when using fixed batteries, the assessment and report

may not be related to specific referral questions and/or contain unnecessary measures that are irrelevant to the referral question (Brenner, 2003). Relatedly, Zins and Barnett (1983) asserted that the more tests are given, the more deficiencies are revealed, which may be redundant, and reduce the sense of efficacy that is felt by parents and interventionists. In general, these concerns are related to the provision of unnecessary information, which may be related to the concerns of length and writing time.

Writing Styles

Some aspects of writing styles have been criticized in the literature, but, overall, there are fewer such studies available. Mastoras and colleagues (2011) specifically criticized the utilization of test-by-test format, asserting that this format contributes to little individualization for the client/patient and jargon-heavy writing. Other researchers found that more thematic approaches are preferred among readers (e.g., Fletcher et al., 2015; Hite, 2017; Umaña et al., 2019). There is also some concern over the qualitative descriptors used within reports. Schoenberg and Rum (2017) found that qualitative descriptors are used variably. Specifically, there were different descriptors for the same score, and there was also an overlap of scores that have different descriptors for different systems, which can lead to significant confusion. Furthermore, there was concern of bias in report writing styles, as they generally focused on weaknesses with little attention to strengths (Mastoras et al., 2011).

Individualization to Client

Another area of concern is the lack of individualization of reports to the client. Reports have been criticized for generic implications and recommendations (e.g., Bram, 2013) and little connection to the individual (e.g., Mastoras et al., 2018). Mastoras and colleagues reported that the link between the specific referral questions, results, and recommendations are often unclear.

Templated report writing has been criticized for its contribution to more generic writing, unhelpful information, and slower completion times (Axelrod, 2013; Bram, 2013; Pei et al., 2018). Overall, reports should be more targeted to individual clients (Brenner, 2003), with more specific resources for families (Evans et al., 2019). There appears to also be a need for new strategies, as many recommendations are also generic and have already been tried by the family (Pei et al., 2011).

Jargon

Jargon is perhaps the most mentioned criticism of report writing, as discussed in sections detailing parent and teacher perceptions of reports. More generally, many studies reporting too frequent use of jargon within reports and suggesting that professionals opt for less jargon and technical writing (Brenner, 2003; Groth-Marnat, 2009; Kainz, 2002; Mayman, 1959; Seagull, 1978; Squire, 2019). Researchers also have commented on the negative effects of excessive jargon in reports, such as lower recall of important information (Bucknavage, 2007), misinterpretation of terms or conclusions (Michaels, 2006), lack of overall meaning of the report to the reader (Taylor & Teicher, 1946), lack of utility of the report (Mayman, 1959), and lack of clarity (Harvey, 2006). Readers of reports are often challenged by the complex language, and they would prefer that language be simplified for clarity and reading ease (Pei et al., 2011; Seagull, 1978; Squire, 2019).

Assessment Barriers

Delagneau and colleagues (2020) summarized many barriers that prevent individuals from gaining access to assessments as well as to successfully implement the recommendations provided once they do receive assessment services. The researchers included a single qualitative question in an online survey of 206 Australian clinicians working with adolescents and young

adults in mental health settings, seeking their perceptions of the utility of neuropsychological assessment. The qualitative analysis revealed several barriers experienced by their participants, including long waiting lists to receive services, physical distance from the facility, low support, and lack of resources. Nonetheless, participants considered neuropsychological evaluations useful if they can be received. Another study also described barriers to recommendations compliance to consider (Dreyer et al., 2010). Specifically, the authors discussed problems related to long waiting lists for other professionals, perceived lack of cooperation from schools, resources being unavailable within their given community, and insurance concerns. Given the findings in these studies, it is important to consider recommendations provided within reports, as they may themselves cause difficulties for families, given the barriers described.

In summary, there are many other common complaints regarding neuropsychological and psychological reports, beyond poor readability and high reading level of reports. Specifically, readers complain of length, writing time, writing style, generic conclusions and recommendations, and the use of jargon among reports. There are also significant barriers not only to receiving an evaluation, but also to complying with provided recommendations. The research in the areas of common problems is relatively consistent despite being conducted over a wide range of population and methods (although the majority surveys). Given this consensus, research among common problems appears quite strong. Many authors have offered suggestions to improve reports and eliminate or lessen these common issues.

Suggestions to Improve Reports

Neuropsychologists report a willingness to adjust their report writing procedures (Postal et al., 2018). Thus, some of the suggestions found below may be acceptable to neuropsychologists to improve their reports for the families and teachers. With respect to the

concern over lack of individualization, studies of psychological (Bram, 2013) and psychoeducational reports (Mastoras et al., 2011; Rahill, 2018) assert that reports should be more specific to the given client, and several authors have proposed solutions. Studies of psychological reports included suggestions of spending more time on reports, using templates, and writing banks sparingly (Umaña et al., 2019), organizing the report around the reason for referral (Mayman, 1959), and integrating information across multiple sources of information (Groth-Marnat & Horvath, 2006).

Parents and teachers have reported many concerns in the application and practicality of provided recommendations. Thus, many authors have called for improved, real-life applications. Suggestions in studies of psychological and psychoeducational report writing included drawing clearer connections between information in the report and how it relates to everyday life (Groth-Marnat, 2009; Rahill, 2018), clearly answering and referring to the referral questions (Rahill, 2018), emphasizing what can be done about weaknesses (Hollander, 1986), and clearly describing appropriate recommendations (Mayman, 1959). Mucka and colleagues' (2018) additionally suggested that parents be provided with multi-part recommendations (i.e., broken down into components), as the parents in their study appeared to understand multi-part recommendations better. Mastoras and colleagues (2011) also provided further guidance on how one may link referral questions, results, and recommendations in their study of psychoeducational reports. Specifically, they suggested that the summary section should not be used to revisit previous information, rather to conceptualize the child. They also suggested making clear connections between the referral questions and specific assessment choices to elucidate the relevance and use of the measures as well as findings from their history to provide

context for assessment results and choices. Further, any weaknesses should be reiterated and followed by matching recommendations that are clear and easily implemented.

As mentioned previously, jargon is a commonly cited issue with reports, and researchers of psychological, psychoeducational, and neuropsychological report writing frequently call for the reduction of jargon and complex language to improve reader understanding (Baum et al., 2018; Groth-Marnat, 2009; Mastoras et al., 2011; Rahill, 2018; Singh et al., 2009; Weddig, 1984). Several strategies have been suggested to reduce the complexity of report writing: (a) shorten sentence length, (b) minimize the number of difficult words, (c) reduce jargon and acronyms, (d) omit passive verbs, and (e) increase the use of subheadings (Harvey, 2006; Squire, 2019). Singh and colleagues (2009) noted that a professional's perception of reduced jargon may not match parents' and teachers' perception of lower jargon, and objective measures of readability may be utilized to check jargon and readability. It should be noted that there is no evidence to support the stance that less technical terminology, and more reader friendly styles would compromise the professional perceptions of reports, (Rahill, 2018).

Some researchers studying psychological report writing have suggested modifications to the training of psychologists to improve report writing. These included teaching simpler writing styles in graduate programs with modeling from supervisors (Harvey, 1997; Harvey, 2006), explicitly teaching clearer report writing styles (Umaña et al., 2019), the use of in-service trainings to teach clear writing skills (Singh et al., 2009), and peer and teacher review of reports with a specific focus on clarity and jargon (Eriksson & Maurex, 2018). Generally, researchers highly suggested that clearer report writing strategies be taught and modeled at the outset.

Many suggestions have been made to modify the format of reports as well as to improve their utility. One suggestion is to write briefer reports (Allott et al., 2011; Michaels, 2006).

Specifically, Allott and colleagues suggested only including summary and recommendations sections in neuropsychological reports, and Michaels and colleagues stressed the importance of including only relevant information in psychological reports. Donders (1999) outlined the benefits of shorter neuropsychological reports as efficiency, organization, utility for other providers, and maintained accuracy, integrity, and clarity. The author also suggested several avenues that one may shorten their reports. Specifically, one need not spend excessive energy on the history section. Further, test results may be included in an appendix rather than a narrative, focusing the results section on the validity, meaning, and implications of the results. There is also an option to include a shorter cover letter to summarize the contents of the report, but this is often not time efficient (Donders, 1999). A second modification to format is related to how the testing data is discussed. Studies of psychological and psychoeducational report writing have suggested that reports should integrate results across functions, rather than in a test-by-test format (Groth-Marnat, 2009; Pelco et al., 2009; Rahill, 2018). Although less researched, some studies have suggested the inclusion of graphics. Two studies found that graphics in psychoeducational reports helped parents remember and understand the contents of the report, regardless of the level of education (Hollander, 1986; Miller & Watkins, 2010).

Many parents and teachers criticized the lack of concreteness of reports, specifically in the recommendations section. Some suggestions have been proposed. In a review of psychological report writing, Brenner (2003) suggested that concrete and explicit recommendations should be provided that specifically address the referral questions. Further, one study suggested writing a brief letter to parents, schools, and referring professionals focused on the issues arising for each party (Tharinger et al., 2008). In addition, psychological assessments should assist in specific treatment planning (Groth-Marnat, 2009). One also may make explicit

connections between the findings and how these inform clinical decisions within psychological reports (Applebaum, 1970) as well as include clear and concrete examples within reports of child deficits and behaviors. These can be used when explaining technical terms as well, to provide context for the psychological assessment results (Harvey, 2006).

Psychologists and neuropsychologists need to consider their audience. Suggestions have mainly been related to modifying formats, level of jargon, and the writing style of the report based upon the intended audience (Applebaum, 1970; Groth-Marnat & Horvath, 2006; Rahill, 2018; Tharinger et al., 2008; Wiese et al., 1986). Guidance in how one may consider their audience is generally lacking in specificity, but mainly it is recommended to tailor the level of jargon when considering the audience.

Furthermore, researchers of psychological and psychoeducational report writing have suggested that professionals obtain feedback and recommendations from those who read and implement what is written, and to adjust writing accordingly (Harvey, 2006; Rahill, 2018; Singh et al., 2009; Weddig, 1984). This may be done with parents, teachers, and other professionals to adjust writing and remain current on techniques (Rahill, 2018). One study also suggests that feedback be obtained related to barriers (e.g., waitlist lengths, finances) that affect adherence to report recommendations, as this may affect appropriate recommendations (Mucka et al., 2017).

Some researchers focusing on psychological and psychoeducation reports have stated that there is often an over-emphasis on weaknesses within reports, and a strengths-based approach may be preferred (Groth-Marnat & Horvath, 2006; Hollander, 1986). In contrast, other researchers cautioned against a strengths-based approach, stating that some argue that reports should not include information that is not requested, and strengths are often not requested, leading to longer reports than necessary (Groth-Marnat & Horvath, 2006). However, they

suggested that a compromise may be to ask referral sources whether they would like information on strengths or to include strengths as part of the interview. As a 'middle ground', Mastoras and colleagues (2011) suggested a balance between both the strengths and weaknesses.

Finally, there have been some suggestions to reduce the amount of time required to write reports in psychological report literature. Harvey (2006) suggested the use of templates, allotting time blocks specifically for report writing, obtaining administrative support or secretaries to help with other work (e.g., phone calls), and using test scoring software rather than hand scoring. Report writing software was also listed as a possibility; however, the author cautioned the use of these due to their limited interpretative capacity. One must evaluate all computer-based test interpretations before finalizing reports (Groth-Marnat & Horvath, 2006). It should be noted that the ideal report length will vary based on many factors (e.g., consumer, referral question, type of assessment), and one must consider these when writing (Groth-Marnat & Horvath, 2006).

In summary, many different suggestions and guidelines have been proposed, but there has been little in the way of clear examples and what is, or is not, compromised when making these changes. Further, some suggestions contradict one another (e.g., increasing time to improve individualization but also needing to reduce time spent writing). These areas need further research. Researchers also have not compared whether there are different preferences or suggestions across report type (e.g., psychological, psychoeducational, neuropsychological) or reader (e.g., parents, teachers, physicians). Relatedly, the studies reviewed did not include consumers' responses to the suggested changes or surveyed them explicitly about proposed changes, rather researchers suggested changes based on identified common problems. Further, few studies have examined what report-writing changes neuropsychologists find acceptable

(Postal et al., 2018). Given the dearth of research on acceptability of changing reports, the present study was focused on the acceptability of the various proposed changes.

The Present Study

Given the issues that have been frequently seen in studies on report writing as well as the lack of studies specific to neuropsychological reports written for parents, this study is designed to fill the gap in the literature in this area. In so doing, this study has four aims. First, I sought to understand common report writing trends of neuropsychological reports and how these may vary based on setting (e.g., hospital, private practice), client (e.g., demographic background), and experience factors (e.g., years of experience, board certification).

Second, given some of the changes proposed across studies of report writing, this study includes an assessment of the acceptability of these changes by neuropsychologists. More specifically, these proposed changes include altering the reading grade level of the report, shortening the report, adding plain-language sections to the report, adding a one-page plain language summary, adding bulleted sections, adding graphs, or reducing the scores/numbers included in the report.

Third, this study includes a survey of parents regarding their satisfaction with neuropsychological reports, as well as their preferences for reports and how useful, understandable, and impactful they were. With the data available from these surveys, this study allowed for examination of possible disconnects between common practices of neuropsychological report writing and parent satisfaction with, and usability of, reports to identify areas for improvement, in conjunction with the acceptability of changing report writing styles. Fourth, as an objective measure of readability, neuropsychologists were solicited for de-identified reports for the researcher to run readability statistics. The readability of the reports is

compared to findings from previous studies on report readability. However, because a small sample size is expected, the provision of reports will be optional for neuropsychologists, and the analyses will be exploratory.

Because one of this project's aims is to examine parents' views, this study was originally focused on pediatric/child neuropsychological reports as opposed to those written for adults. However, upon advice from the committee, the study aim was broadened to include all neuropsychologists to obtain an adequate sample size. Given the nature of the study purposes, some data lends itself to quantitative methods of analyses, whereas other areas may be better assessed with qualitative methods. Thus, this study involves a convergent-parallel mixed methods approach, in which qualitative and quantitative approaches will be independently utilized, and their findings will be converged at a point of integration (Schoonenboom & Johnson, 2017). Specifically, the point of integration of this study will be related to the analysis of the overall experience of writing or reading neuropsychological reports, which will be detailed in the results and discussion sections. Hypotheses will be provided for data tested with quantitative methods, and research questions will be proposed to assess quantitative aspects of this project.

Specific Hypotheses and Research Questions

Hypothesis 1

Several researchers cited throughout the literature point to experience factors and practice characteristics as being related to report characteristics (Doners, 2001b; Postal et al., 2018). Previous studies include descriptions of factors, such as years of experience. (Donders, 2001a), board certification (Donders, 2001b, Postal et l., 2018), and practice setting. (Donders, 2001a), that may be related to characteristics of neuropsychological reports. Therefore, it is hypothesized

that variation in certain neuropsychological report characteristics (i.e., report length, writing time, results section format, and use of numbers in the report body) will be associated with years of experience, board certification, and type of practice setting.

Hypothesis 2

Researchers examining parent satisfaction with reports and satisfaction across different types of readers in general have suggested that readers struggle with the length of reports (e.g., Brenner, 2003), the format of report sections (e.g., Mastoras et al., 2011), and the use of scores/numbers (Umaña et al., 2019). Furthermore, parents specifically have indicated difficulties with their ability to understand reports (e.g., Hite, 2017) and to later use recommendations provided (Postal et al., 2018). These factors also contributed to variation in satisfaction across several studies (e.g., Farmer & Brazeal, 1998; Hite, 2017). Based on the previous literature, it is hypothesized that variation in overall parent satisfaction will be associated with report characteristics, specifically, report length, report format, use of numbers, and parent ratings of understanding/readability and feasibility.

Hypothesis 3

Aside from report characteristics, there appear to be factors external to the report that readers are less satisfied with. Previous studies detail difficulties with barriers to implementing recommendations (Dreyer et al., 2010; Keenan et al., 2019) and to receiving assessment services (Delagneau et al., 2020). One study also reported a negative association between parent education and satisfaction (Bodin et al., 2007; Kirkwood et al., 2017). Furthermore, a larger number of children in the household also may serve as a barrier to assessments. Thus, it is hypothesized that variation in overall parent satisfaction will be associated with parent education

level, number of children in the household, and barriers to treatment and services that the parent endorsed.

Research Questions

1. What are the current report writing trends for neuropsychologists, specifically related to page length, writing time, inclusion of testing data in the body, and writing format?
2. How open are neuropsychologists to changing their report writing styles?
3. How satisfied are parents with neuropsychological reports? Specifically, what are parents' views of report readability and usability, and what are their experiences when reading and using these reports?

CHAPTER 3

METHOD

Participants

In general, participants were obtained from email solicitation of neuropsychologists and social media advertisements. Two different groups of participants were included in this study: neuropsychologists and parents. Inclusion criteria are discussed for both groups in the subsequent participant descriptions.

Neuropsychologists

There were 71 neuropsychologist participants in this study. Descriptive information about the neuropsychologist sample is presented in Table 1. The neuropsychologists included licensed practitioners or current trainees in clinical neuropsychology who have met (or are working toward meeting) the Houston Conference Guidelines of Neuropsychology. The Houston Conference guidelines were used to confirm whether the participant is a neuropsychologist. However, neuropsychologists/psychologists were allowed to continue with the survey if they indicated they are neuropsychologists but have not met the Houston Guidelines. Those psychologists who did not meet the Houston Conference criteria were excluded from the main analyses. Retired neuropsychologists also were excluded from the study to ensure that the data reflected current report-writing. Neuropsychologists must have written at least one neuropsychological report over the course of their practice, and the consent form contained language stating that neuropsychologists must currently be engaged in report-writing. Neuropsychologists were primarily recruited via email solicitation, alumni contract lists from the researcher's program, and social media (e.g., Twitter, Facebook, Instagram). Attempts were made to recruit via professional listservs (e.g., American Academy of Neuropsychology, Society

for Clinical Neuropsychology) and professional membership directories (e.g., National Academy of Neuropsychology, International Neuropsychological Society), but my requests for access were denied.

Parents

There were seven parent participants in this study. Description information about the parent sample is presented in Table 2. The parents were primarily solicited through social media and agencies (e.g., private practices) who were willing to post research advertisements in their practice spaces (e.g., waiting rooms, office space). Any parent who has a child that has undergone a neuropsychological evaluation is welcome to participate. Neuropsychological reports for parents will be defined as those which are centered around brain-based medical disorders (e.g., epilepsy, brain tumor) and/or neurodevelopmental disorders (e.g., Autism Spectrum Disorder, Attention-Deficit/Hyperactivity Disorder). Further, the report title should state the report is a neuropsychological evaluation and/or the practitioner title of the signed reported is listed as "neuropsychologist." Parents who indicated that the report is not a neuropsychological report were still allowed to participate. Their child must have been under the age of 18 when the evaluation was completed to participate in the study.

Measures

Neuropsychologist Questionnaire

A questionnaire was created for this study to be completed by neuropsychologists (See Appendix A). Demographic information was gathered at the beginning of the questionnaire, which included data related to personal characteristics (i.e., age, race/ethnicity), number of years of experience (Donders, 2001a), primary population of practice, primary practice location (Donders, 2001a; Postal et al., 2018), board certification status (Donders, 2001b; Postal et al.,

2018), and Houston Guidelines status (to confirm status as neuropsychologist). This survey also included questions related to report-writing practices, including hours spent writing reports, page length of reports (Donders, 2001b; Postal et al., 2018), major sections of the report (e.g., Sattler, 2014), whether and how various numbers and scoring systems are included in reports (Donders, 2001b), and writing format/organization (e.g., thematic; Groth-Marnat, 2009, Rahill, 2018). The questionnaire included a link for neuropsychologists to provide a de-identified report for readability analysis. However, this was optional for neuropsychologists. Those who chose to upload a report were exempted from the questions related to report characteristics.

The neuropsychologist questionnaire also included items to assess the acceptability of the proposed changes to common report writing practices, as seen in previous studies surveying neuropsychologists (Postal et al., 2018) offered in the studies reviewed above such as reducing jargon and technical writing (e.g., Groth-Marnat, 2009), reducing use of templates (Umana et al., 2019), shortening reports (e.g., Allott et al., 2011), incorporating education and training for plan-language writing (e.g., Harvey 1997), writing in thematic formats (e.g., Groth-Marnat, 2009), using bulleted summaries (Postal et al., 2018), reducing time spent writing reports (e.g., Harvey, 2006), altering recommendations to be more concrete and applicable to daily life (e.g., Groth-Marnat, 2009), writing in a strengths-based format (e.g., Groth-Marnat & Horvath, 2006), and gathering feedback from individuals about the report (e.g., Rahill, 2018). Neuropsychologists were surveyed with both open-ended questions and quantitative endorsements related to potential concerns they have in changing current report-writing practices such as lack of training in plain language writing (Harvey, 2006) and concerns of professionalism (Postal et al., 2018; Rahill, 2018). There was also space to provide additional recommendations to change report-writing practices in an open-ended format, as well as overall thoughts related to neuropsychological

assessment practice and additional comments of interest related to the field. Questions were added to determine the effects, if any, of the COVID-19 pandemic on the neuropsychologists' report writing practices.

Parent Questionnaire

A parent questionnaire was also created for this study (see Appendix B). For parents, demographics included age, race/ethnicity, years of education, socioeconomic status, and number of children. Their child's age at the time of evaluation was included to confirm they meet inclusionary criteria. Parents were asked about the referral source, evaluation setting, and reason for referral for an evaluation to provide context for the evaluation. Parents were asked if a neuropsychological report has been completed and for how many of their children to determine whether questions were answered with one or multiple reports in mind. Parents were allowed to continue if they indicated that the report was not neuropsychological; however, all parents that remained after the removal of automated data indicated that their child received a neuropsychological report. A question was also included related to the report year of completion to determine whether the evaluation and report was completed pre- or post-COVID-19 pandemic.

This questionnaire included questions pertaining to parent satisfaction with the report received in the areas of understanding and readability of the report (e.g., Hite, 2017, Tharinger et al., 2008), understanding of their child (e.g., Austin et al., 2019), provision of helpful recommendations (e.g., Kirkwood et al., 2017), answering of the referral question (Sattler, 2014), impact or help provided by the evaluation (e.g., Farmer & Brazeal, 1998), diagnoses (Pei et al., 2011), wait time for an appointment (e.g., Delagneau et al., 2020; Kirkwood et al., 2017), and wait time for the final report (e.g., Delagneau et al., 2020; Postal et al., 2018). The impact of the

report was also assessed through ratings of ease of implementing recommendations, implementing strategies at home (e.g., Tharinger et al., 2008), implementing strategies at school (e.g., Farmer & Brazeal, 1998), seeking outside services recommended in the report (e.g., Dreyer et al., 2010), and general follow through with report recommendations (e.g., Dreyer et al., 2010). Parents were asked in open-ended and checklist format whether they would find any of the suggestions discussed in the neuropsychologist survey helpful for improving the reports, including reducing jargon (e.g., Groth-Marnat, 2009), shortening reports (e.g., Allott et al., 2011), writing in thematic formats (e.g., Groth-Marnat, 2009), using bulleted summaries (Postal et al., 2018), altering recommendations to be more concrete and applicable to daily life (e.g., Groth-Marnat, 2009), writing in a strengths-based format (e.g., Groth-Marnat & Horvath, 2006) adding graphics, and reducing number use. This only included suggestions applicable to parents, so suggestions specific only to report writing by neuropsychologists (e.g., reducing writing time) were not included.

Parents were asked whether they encountered specific barriers over the course of the evaluation. Specifically, questions included long waiting times for appointments (e.g., Kirkwood et al., 2017), distance from the practice setting, financial concerns for the evaluation, financial concerns for the recommendations, scheduling difficulties, missing school and/or work (Delagneau et al., 2020), or language barriers. Parents were also asked about the turnaround time for the final report and whether they encountered any difficulties as a result of this turnaround time (Postal et al., 2018). Open-ended feedback was solicited related to barriers, suggestions, satisfaction, and any other topics that parents felt were important to share.

Parents were also asked whether they have a copy of the report readily available before moving on to the final section of the questionnaire, which included questions about specific

characteristics of the report that was received for their child or adolescent. These included more simplified questions related to report characteristics. Specifically, the page length of the report (e.g., Donders et al., 2001b; Postal et al., 2018), included sections (Sattler, 2014), format of the results section (e.g., Donders, 2001b; Postal et al., 2018), and whether numbers were included in the body of the report (e.g., Donders, 2001b).

Procedure

Participant Recruitment and Data Collection

Before commencing data collection, approval was obtained from the Institutional Review Board (IRB) at Southern Illinois University at Carbondale. Following approval, the researcher sought permission to post research solicitation on professional listservs for neuropsychologists as well as to directly email those listed in professional directories. Such agency permissions were denied, and that means of recruitment was abandoned. Permission was obtained to post research advertisements on social media to obtain parent and neuropsychologist participants. Platforms included Instagram, Facebook, and Twitter. Neuropsychologists were also solicited directly via email. Email addresses were found via Google, primarily found as part contact information on private practice, agency, and university websites. Two follow-up emails were sent for a total of three solicitation emails. These were sent one week apart. Agencies also were solicited to post participation flyers within waiting rooms of their practices. The consent form stated that neuropsychologists should currently be engaged in report-writing to ensure retired neuropsychologists would not participate.

Data were gathered online via surveys created on Qualtrics. A separate survey was created for both groups. Once permission was obtained for research solicitation, a post was made that included a cover letter for the study, followed by the corresponding for either the

neuropsychologist or parent survey. A consent page was included at the beginning of each link, and all surveys were completed confidentially. Each survey asked for demographic information specific to each group (see above). The questionnaires took approximately 5-15 minutes to complete.

The neuropsychologist version of the survey included an optional link to upload a de-identified report. This required an HSC addendum, as the researcher originally provided a space to copy and paste the report, but Qualtrics would now allow adjustments to a character limit. Thus, IRB approval was obtained to include a Dropbox file request link to include in the survey. A cover letter for this analysis page and consent was also included. This page also included suggestions for de-identifying the report (i.e., replace all names of people with fictional names or place, remove sentences containing any background information in the history that is uniquely identifying), and neuropsychologists were also asked to remove their own name from the report to keep survey responses confidential. However, both neuropsychologists did not remove their names from uploaded reports. Because a separate link was used to upload reports, this was not linked to other survey responses. Participants were asked to upload this as a Microsoft Word document, but they were uploaded as PDFs. This required the researcher to download and convert to Word documents. The settings to include readability statistics in Word were then turned on, and the researcher calculated and recorded the readability statistics.

Upon completion of the questionnaire, participants were provided a link to a separate Qualtrics survey where they could include their contact information to be entered in a drawing to win one of three $25 Amazon gift cards for each group. A separate survey link was used to ensure that survey responses remain confidential. There was one gift card available for each group. Neuropsychologists who provided a de-identified report earned an extra entry into the

drawing as an incentive for de-identifying and uploading the report. Participants were not required to answer all the questions in the survey, and they could exit the survey at any time.

Readability Analysis

I conducted readability exploratory analyses using the two de-identified reports provided by neuropsychologists. It was asked that reports be included as Word documents for ease of readability calculation. However, two reports were provided as PDF documents, which required conversion to Word documents to calculate Flesch readability formulas. Of the available statistics, this study utilized the average number of sentences per paragraph, average number of words per sentence, Flesch Reading Ease and Grade Level, and percentage of passive sentences for the two reports provided.

Data Cleaning

Bot Data Removal. Shortly after data collection commenced, it became clear that several responses were not legitimate. There was heavy suspicion of bot-provided data, which are described as computer programs designed to quickly complete automated tasks via the Internet (Teitcher et al., 2015). Therefore, data cleaning was required to remove fraudulent responses. The literature provided several suggestions to help identify and remove bot responses from the data. Griffin and colleagues (2021) suggested a three-step approach to prevent and detect bots when conducting survey research, which targets the study design, recruitment of participants, and data cleaning procedures. Many of the suggestions overlapped with other studies discussing bot prevention and detection, and these suggestions were sequentially carried out in the present study.

First, in the survey design, it was suggested that, at minimum, the survey should include reCAPTCHA verification to screen out less advanced bots (Bybee et al., 2021; Griffin et al.,

2021; Storozuk et al., 2020; Teitcher et al., 2015), as well as settings to prevent multiple submissions via internet cookies (Griffin et al., 2021; Teitcher et al., 2015). The present study included reCAPTCHA responses at multiple points throughout the surveys; however, many bots were able to bypass these less sophisticated methods for screening bots, which was also seen in the literature (Bybee et al., 2021; Griffin et al., 2021; Storozuk et al., 2020; Teitcher et al., 2015). Similarly, ballot-box stuffing prevention settings were turned on within Qualtrics to prevent multiple submissions, which uses internet cookies to prevent multiple submissions.

Second, Griffin and colleagues (2021) suggested altering the recruitment process to be less enticing to bots. For example, researchers suggested the use of lottery-based compensation, rather than automated or guaranteed compensation, for each response to reduce the number of bot responses (Bybee et al., 2021; Storozuk et al., 2020; Teitcher et al., 2015). The present study also used a lottery-based system for recruitment. At this stage, Griffin and colleagues also suggested repeating demographic questions to screen for bots. The present study did utilize some demographic questions; however, these were limited to maintain confidentiality. Nonetheless, in the neuropsychologist survey, one duplicate question was able to provide a marker for inconsistent demographics. Specifically, one question asks the participant's current practitioner status, which includes "board-certified neuropsychologist" as an option. Several items later, participants are asked in yes-no format whether they are board-certified. Inconsistent responses on these items assisted in the removal of some bots.

Finally, Griffin and colleagues (2021) describe data cleaning methods to assist in identifying and removing bots. Several response indicators can be used to assist in data cleaning (Bybee et al., 2021; Griffin et al., 2021; Storozuk et al., 2020; Teitcher et al., 2015), and it is strongly recommended that researchers use multiple methods to identify bots (Storozuk et al.,

2020; Teitcher et al., 2015). Thus, the present researcher used all methods that were available based on the survey data and questions. One such method was screening for inconsistent responses, as described above. Other studies suggested removing exact duplicate responses on open-ended questions (Bybee et al., 2021; Griffin et al., 2021; Storozuk et al., 2020). In the present study, a sizable number of bots were able to be detected and removed based on exact duplicate responses submitted either in succession or within a similar time period. For example, five responses in a row were removed as the final open-ended response question was answered: "without the." Similarly, five responses in a row included an open-ended response stating, "there are no more questions."

Researchers also suggested examining open-ended responses to detect bots (Bybee et al., 2021; Griffin et al., 2021; Storozuk et al., 2020). Storozuk and colleagues (2020) suggested that this is an excellent and one of the most effective means to screen for bots, recommending that researchers look for responses that are incomprehensible, unrelated, or duplicated. These methods were employed on open-ended responses for the present study and proved to be effective in identifying nonsensical responses. For example, in response to the parent survey question "Is there anything we didn't ask that you think would be important to understanding parent experiences reading and using reports?" examples of removed responses included, "learn tolerance and tolerance," "Love your child, respect your child, be your child's bosom friend Respect your child in your life," and two responses stating "yes, it is." In response to a question querying general satisfaction, three responses in a row were removed which stated, "very satisfied with."

On the neuropsychologist survey, in response to a question asking participants to describe changes in their practice due to the pandemic, examples of removed completed surveys included

"d," "thought solidification," and "ni." When asked about any additional information the participant would like to provide, examples of removed responses included "there is no" and "NO" several times in a row. When asked about concerns with changing reports, one response was removed stating "Reports must be readable for patient and providers… no longo." Based on these methods, 7 of the 21 parent survey responses and 71 of the 156 neuropsychologist responses were deemed legitimate. However, one parent left most of the questions blank, and many statistics for the parent data only include six participants as a result.

It should be noted that, for the sake of complete anonymity for respondents, several suggested methods to prevent and remove bots were unable to be utilized. For example, researchers have suggested tracking IP addresses for duplicates or inconsistencies, collecting birthdates, collecting email addresses within the main study, or collecting other demographic or verifiable contact information (e.g., addresses, phone numbers). Furthermore, many studies advised caution with sharing public links or using social media as means of recruitment (Bybee et al., 2021; Griffin et al., 2021; Storozuk et al., 2020). However, given the nature of the study as well as the ongoing pandemic, there were limited accessible means for data collection (e.g., in-person collection) outside of social media.

In addition to the above methods, many studies suggest using survey completion time as an indicator of fraudulent responses (Bybee et al., 2021; Griffin et al., 2021; Storozuk et al., 2020), with some studies suggesting under five minutes as a potential indicator of an invalid completed survey (e.g., Storozuk et al., 2020). However, the present study was purposefully designed to be brief to encourage participation. Thus, this method was not employed in data cleaning. Nonetheless, Qualtrics provided a setting to check abnormally fast responses against

the mean response time, and this screening tool did not detect bots over the course of data collection.

Bybee and colleagues (2020) also suggested observing large question blocks with missing data to detect bots. Missing question blocks did occur in the data, specifically, opting to skip questions about reports and uploading a de-identified report in its place. Several respondents stated they would upload a report and skipped these items to the questionnaire. However, this was not effective in determining bot responses, as there were a substantial proportion of respondents who, despite skipping this question block, passed all other bot indicators, including open-ended responses. It may be that participants were purposefully skipping these questions or forgot to copy the links to upload sample reports later.

Given these considerations and the limitations of bot detection methods, some completed bot surveys may have remained in the final sample. Furthermore, it is also possible that legitimate completed surveys were removed from the sample. For example, English proficiency may hinder a participant's ability to respond to an open-ended response. Thus, the findings of the study should be interpreted in light of these considerations. Future studies should explore alternative means for collection or consider including identifying information within a larger scale study.

Qualitative Data Analysis

To address the qualitative research questions, a qualitative content analysis (e.g., Cho & Lee, 2014) was used stemming from the post-positivist paradigm (for a review, see Chwalisz et al., 2008). Qualitative content analysis involves a combination of inductive and deductive processes to interpret and categorize qualitative data, with less emphasis on theory than other qualitative methods. This approach was chosen for the qualitative data analysis in this study,

because it is better suited to the mixed methods nature and goals of this study than traditional qualitative strategies.

The responses to the open-ended questions were examined to understand the common experiences with reports, both their writing and reading, as well as the implementation of the findings. The aim was to understand the common elements found among these open-ended responses to develop suggestions for potential changes to improve overall experience. Furthermore, open-ended responses provided information about experiences, suggestions, and concerns of neuropsychologists as they considered their report writing practice. Open-ended responses were analyzed using the constant comparative method (Glaser, 1965). The qualitative analyses also included descriptive statistics (e.g., frequencies, means, standard deviations, percentages) on the various questionnaire items for both participant groups. For neuropsychologists, descriptive statistics included the report characteristics in the questionnaire and perceptions of openness to change. For parents, descriptive statistics that were examined were related to satisfaction, barriers, usefulness, etc. to obtain a general description of satisfaction, perceptions, and usefulness of reports. Data from descriptive statistics were examined in conjunction with open-ended responses to supplement the information gathered from neuropsychologists and parents.

Open-ended responses were coded, and similar codes were grouped together to form general categories among responses. If there were several categories that appeared to relate to one another, then a larger theme was identified. However, not all categories related to others to form themes. In practice, the open-ended responses were all read to become more familiar with the data and to begin forming ideas about emerging categories (Erlingsson & Brysiewicz, 2017). Each open-ended response was then examined by carefully reading each response and extracting

distinct ideas or concepts from each response to form distinct units of meaning or codes (Glaser, 1965; Glaser & Strauss, 1967). Specifically, the first sentence of an open-ended response would be read, and the main concepts would be extracted and compared to existing categories to determine whether the idea was consistent with ideas of the existing category, or if a new category needed to be formed (Glaser, 1965; Glaser & Strauss, 1967). This was repeated for each sentence of the open-ended responses. If one sentence contained multiple distinct ideas, these ideas would be separated into new or existing categories.

Categories were revisited to determine whether there were categories that contained similar ideas and should be integrated (Glaser, 1965; Glaser & Strauss, 1967). The separate categories were then observed to determine if there were common themes across categories to develop theories about neuropsychologists' various perceptions of their current report-writing and changing report writing (Glaser, 1965; Glaser & Strauss, 1967). However, while the constant comparative method generally aims to find a theory to connect the various categories (Glaser, 1965; Glaser & Strauss, 1967), several distinct themes emerged from these data that did not lend themselves to a single theory. This is unsurprising, given that qualitative data was analyzed from a question asking neuropsychologists to describe any "other" thoughts they may have had. Thus, while the final step of the constant comparative method involves writing the theory including data from the various categories and themes to support one substantiated theory, this study includes descriptions of multiple theories and their related themes and categories.

CHAPTER 4

RESULTS

The Results chapter begins with the preliminary analyses, which include the power analyses conducted to ensure sufficient sample sizes as well as the procedures used to ensure the assumptions were met for the statistical procedures selected. Before discussing statistical analyses, demographic variables for the sample are detailed to gain an understanding of the sample characteristics. The results also include the main quantitative analyses, followed by qualitative analyses to the research questions via open-ended response content analysis along with frequencies and percentages. Finally, select exploratory analyses are presented.

Preliminary Analyses

Power Analysis

The original data analysis plan for the present study included logistic regression. However, a large sample size is required to conduct this statistical analysis, and an exact a priori sample size could not be determined before data collection. Specifically, power analyses for logistic regression are generally based on odds ratios for the proportion of successes versus failures (Faul et al., 2009, Hsieh et al., 1998). However, given the limited research available in this field, few estimations to calculate odds ratio probabilities were available to calculate an a priori power analysis. An estimate of probabilities was obtained by utilizing the data provided by Postal and colleagues (2018) in which "moderate" or more perceptions of effective communication was utilized as the alternate hypothesis probability and "minimal" or lower efficacy in communication was utilized as the null probability. Using G*Power (Faul et al., 2009), the estimated needed sample to achieve 80% power at an alpha of .05 based on these estimations was 51. However, some researchers proposed that the appropriate sample size for

logistic regression must be at least 100 to obtain a more accurate effect estimation (Bujang et al., 2018; Long, 1997).

After data collection was completed, only six parent participants were obtained, which is far below either estimate of sample size for logistic regression. Thus, logistic regression could not be used to analyze the parent data. For the neuropsychologist group, 71 participants were obtained. However, when running sample ordinal logistic regressions to obtain probabilities, 20 missing cases were identified for questions related to report characteristics, as discussed above, which reduced the sample to 51 as a conservative estimate. When running a power analysis with report length as the dependent variable and years of experience, board certification, and practice setting as independent variables, the power achieved was calculated as 0.0002. Similarly, when writing time was substituted as the dependent variable, the achieved power was 0.0001. Number use and report format variables were measured at a nominal level and, therefore, were not appropriate for ordinal regression. Thus, the neuropsychologist sample size was insufficient for ordinal logistic regressions for eligible dependent variables in the present study. As a result, alternative statistical procedures were utilized.

The alternative statistical procedures included Kendall's tau, a non-parametric correlation that is useful in data sets with a small sample size, where many ranks are expected to be similar (Field, 2009). According to May and Looney (2020), based on a review of research articles utilizing these statistics, 30 subjects are required to detect at least a correlation of .50 at the alpha .05 level to achieve 80% power. For categorical data that are not ranked (e.g., practice setting), a Cramer's V statistic was calculated, which allows one to examine the relationship between two categorical or nominal variables with more than two categories (Field, 2009). Cramer's V is not sensitive to samples sizes (Crewson, 2016), but one resource indicated that a sample size of 30 is

ideal for Cramer's V (Frey, 2018). In this case, the parent sample also did not meet the 30 required participants, so Kendall's tau was not used. However, given that Cramer's V is not sensitive to sample size, this was used exclusively for the parent group analyses. The neuropsychologist group met the minimum samples size, and Kendall's tau was used for variables that were categorical but not nominal. For nominal data, Cramer's V was used to test hypotheses. Assumptions for these statistical procedures are discussed below.

Checking Assumptions

Cramer's V holds few assumptions. Specifically, Cramer's V assumes that data are measured at either the ordinal or the nominal level (Laerd Statistics, 2018a). Furthermore, Cramer's V is used when the variables have more than two categories (Field, 2009). For these data, nearly all variables tested in the hypotheses were nominal or ordinal. However, for those that were measured continuously, additional coding was utilized to transform the data into categorical variables to meet the criteria for analyses required by Cramer's V. Specifically, years of experience were coded in multiples of 5 up to 30 or above, and the number of children was coded in multiples of 1 child, 2 children, 3 children, and four or more children. This coding was based on the distribution of parent responses to this question to ensure that each value would contain more than one participant.

Furthermore, to obtain overall satisfaction and feasibility ratings, the median was determined among the individual ratings across several areas of satisfaction and feasibility of implementation, as the median is the preferred measure of central tendency in ordinal data (Field, 2009). To maintain this data as ordinal, data were rounded to the nearest whole number. Thus, all variables met the assumptions for Cramer's V following additional coding. Cramer's V also assumes the independence of observations and random samples (Frey, 2018), and this study was

not a repeated measures design, meeting the first assumptions. Given that the present study randomly sampled the population of interest through mass email solicitation via Google and social media posts, the second assumption of random sampling is met (Gliner et al., 2017). Furthermore, the Cramer's V is generally run together with a Pearson's chi-square test to test the strengths of any associations (Field, 2009). The assumptions for chi-square tests include the independence of observations and that the expected frequencies are larger than 5 (Field, 2009). Both assumptions are met in the case of the neuropsychologist data. The parent sample size will have a smaller number per cell. Thus, these results should be interpreted with caution as they are underpowered.

Kendall's tau assumes that variables are at least ordinal; thus, ordinal and continuous variables can be used in this equation (Laerd Statistics, 2018b; Pett, 2016). In this study, variables are mostly ordinal or continuous, and nominal variables (i.e., practice setting, number use, results section format, board-certification) were analyzed with Cramer's V. Kendall's tau also assumes that data points are gathered on the same person (Pett, 2016), which is true for the present sample, as responses are gathered for the same person on multiple items. One resource stated that variables in Kendall's tau should have a monotonic relationship between variables; however, it was noted that this assumption is not strict (Laerd Statistics, 2018b), and it was not discussed in other resources discussing Kendall's tau (Field, 2009; Pett, 2016). Nonetheless, monotonicity was assessed for variables eligible for Kendall's tau. The relationships between report length and years of experience and writing time and years of experience appeared monotonic for the neuropsychologist variables.

Descriptive Analyses for the Samples

Descriptive results include how participants, both neuropsychologists and parents, described their reports. Data include descriptive statistics, specifically frequencies and percentages. Descriptive statistics for neuropsychologist demographic variables are presented in Table 1. Overall, there was a larger proportion of female participants, and most participants identified as white/Caucasian. Most participants were professional neuropsychologists (licensed and/or certified), followed by neuropsychology graduate students. Adults represented the largest proportion of patient populations, with pediatrics being second, and private practice was the largest practice setting, followed by medical settings (medical hospitals, and academic medical settings). Nearly all participants met, or were meeting, the Houston Guidelines. Of the professional neuropsychologists, a minority identified as board-certified. A Chi-square was conducted to test associations between select demographic variables, and the results are displayed in Tables 2 and 3. Most demographic variables assessed were independent of each other. However, results indicated that board certification was significantly associated with years of experience, $\chi^2 = 23.79$, $\phi c = .71$, $p < .001$.

Parent descriptive data are presented in Table 4. The majority of respondents identified as male and/or white/Caucasian. Reason for referral varied, with "other" being the most common category and no one identifying "medical concerns." Family income was distributed evenly across the categories provided. Parent education level also was distributed evenly across the categories provided. Chi-square to test associations between select demographic variables are displayed in Tables 5 and 6. All demographic variables for parents were independent of each other.

Main Quantitative Analyses

The main quantitative analyses were directed at testing the a priori hypotheses. In this analysis process, an additional five cases were removed from the neuropsychologist subsample, because the participants indicated they have not met Houston Guidelines.

Hypothesis 1

Hypothesis 1 stated there will be an association between neuropsychological report characteristics (i.e., report length, writing time, results section format, and use of numbers in the report body) and neuropsychologist professional factors, including years of experience, board certification, and type of practice setting. To analyze this hypothesis, two sets of statistics were used. First, Kendall's tau was run to assess the relationship between years of experience and both report length and writing time. When entering these three variables into the equation, results indicated a moderate, but significant, negative correlation between years of experience and length of writing time, $\tau b = -.25$, $p = .028$. Similarly, the relationship between years of experience and page length of reports was moderate but significant, $\tau b = -.30$, $p = .030$. Results for this analysis are summarized in Table 7.

For the remainder of the variables in hypothesis 1 (i.e., result section format, number use, board certification status, and practice setting), chi-square and subsequent Cramer's V analyses were conducted to evaluate the association between these variables. When examining the association between board-certification status and use of numbers in the report body, there did not appear to be a relationship between the two variables according to the chi-square test, $\chi^2 = .80$, $p = .371$, and the strength of association was weak and nonsignificant, $\phi c = .13$, $p = .371$. Similarly, board-certification was independent of result section format, $\chi^2 = 2.09$, $p = .554$, with a weak relationship between variables, $\phi c = .21$, $p = .554$. Chi-square analysis examining the

relationship between practice setting and number use was nonsignificant, $\chi^2 = 1.62$, $p = .899$ too, and the strength of association was weak and nonsignificant, $\phi c = .19$, $p = .899$. Practice setting was not associated with result section format and displayed a weak relationship, $\chi^2 = 14.57$, $\phi c = .33$, $p = .483$.

As board certification status and practice setting were believed to be nominal variables, the associations between board certification and both report length and writing time, as well as practice setting and both report length and writing time, were assessed using chi-square and Cramer's V. There was no association between practice setting and writing time, $\chi^2 = 34.43$, $\phi c = .30$, $p = .543$. However, there was a large association between practice setting and report length, with a correspondingly strong effect, $\chi^2 = 51.33$, $\phi c = .47$, $p = .009$. When examining frequencies, integrated care settings appear to have longer evaluation reports, with greater proportions of those professionals endorsing reports lengths in the 26-31 or more-page range. In contrast, neuropsychologists at university training clinics and medical hospitals most frequently wrote reports of 1-5 pages. Board certification status was associated with writing time, indicating a large effect, $\chi^2 = 15.29$, $\phi c = .50$, $p = .018$. When examining frequency tables, board-certified neuropsychologists endorsed writing shorter reports, most frequently writing reports for 1-2 hours, followed by 3-4 hours. Non-board-certified neuropsychologists most frequently endorsed writing reports for 3-4 hours, followed by 1-2 hours. Non-board-certified neuropsychologists also had a much larger spread of writing times. Specifically, whereas the majority (16 of 18) of board-certified neuropsychologists wrote reports for between less than one to four hours, those who were not board-certified endorsed report-writing times ranging from 1-10 hours overall. As noted in the section examining associations between demographic factors for neuropsychologists, there is an association between board-certification and years of experience,

indicating associations between experience factors and writing time overall. However, there was no association between board-certification and page length, $\chi^2 = 5.44$, $\phi c = .34$, $p = .489$. Results for these analyses are summarized in Tables 8 and 9.

The ordinally coded years in practice variable was used to examine potential associations between years of experience and both report format and number use. Results indicated that there was no association between years of experience and number use, $\chi^2 = 2.05$, $\phi c = .25$, $p = .915$, or report format, $\chi^2 = 12.95$, $\phi c = .36$, $p = .795$. Results for this analysis are displayed in Table 10.

Hypothesis 2

Hypothesis 2 was that overall ratings of parent satisfaction would be associated with report length, report format, use of numbers, and parent ratings of understanding/readability and feasibility. Given the small sample size, chi-square and Cramer's V were run to evaluate hypothesis 2. Variables used for this analysis included the previously coded, central tendency satisfaction rating and page length, results format, use of numbers, parent satisfaction with understanding, and overall feasibility rating. Results indicated that parent satisfaction was not related to page length, $\chi^2 = 4.50$, $\phi c = .61$, $p = .609$; results structure, $\chi^2 = 2.63$, $\phi c = .66$, $p = .269$; general understanding, $\chi^2 = 7.00$, $\phi c = .76$, $p = .321$; or overall feasibility, $\chi^2 = 7.00$, $\phi c = .76$, $p = .136$. SPSS could not calculate the association between average satisfaction and number use as only one participant completed this question. Results for this hypothesis should be greatly interpreted with caution given the small sample size (six participants). Results are displayed in Table 11.

Hypothesis 3

Hypothesis 3 examined the association between overall parent satisfaction and parent education level, number of children in the home, satisfaction with wait time for their report, and

each of the barriers to treatment endorsed. Parent satisfaction was not associated with the number of children, $\chi^2 = 3.25$, $\phi c = .52$, $p = .517$; education level, $\chi^2 = 8.25$, $\phi c = .83$, $p = .220$; wait time for the report, $\chi^2 = 7.00$, $\phi c = .76$, $p = .136$; wait time for an appointment, $\chi^2 = 3.00$, $\phi c = .71$, $p = .223$; distance from the neuropsychologist, $\chi^2 = 3.00$, $\phi c = .71$, $p = .223$; insurance barriers to the evaluation, $\chi^2 = .60$, $\phi c = .32$, $p = .741$; insurance coverage of recommended services, $\chi^2 = .60$, $\phi c = .32$, $p = .741$; inflexibility in scheduling, $\chi^2 = 3.00$, $\phi c = .71$, $p = .223$; missing work, $\chi^2 = .60$, $\phi c = .32$, $p = .741$; nor missing school, $\chi^2 = 2.63$, $\phi c = .66$, $p = .269$. SPSS could not calculate the association between parent satisfaction and language barriers or "other" barriers because there was insufficient variance among responses (i.e., variable is a constant). Specifically, no parent endorsed experiencing either barrier. Results should be interpreted with caution given the small sample size (six participants). Table 12 summarizes these results.

Addressing the Research Questions

Beyond the a priori hypotheses, these data were used to answer some more basic research questions related to the nature of report writing and perceptions of neuropsychological reports. Qualitative analyses of open-ended responses are incorporated throughout these results to provide more detailed descriptions about the following research questions.

Research Question 1: Current Report-Writing

Research Question 1 concerns the current report writing trends for neuropsychologists. Specifically, the present study was designed to gain a general understanding of report characteristics such as page length, writing time, inclusion of testing data in the body, and writing format for neuropsychologists. It should be noted that many neuropsychologist participants skipped the report characteristics section of the survey, resulting in missing data for 17 individuals. Thus, the sample size regarding report characteristics includes 46 participants.

However, questions regarding writing time were answered by 62 neuropsychologists. Frequencies and percentages can be found in Table 13.

Qualitative, open-ended responses by neuropsychologists indicated that reports are often driven by the audience or the purpose of the report, which supported a theme entitled *considering our report audiences*. These neuropsychologists appear concerned about audience perceptions of their reports, as well as the level of helpfulness for various audiences and report purposes. One neuropsychologist asserted that "the audience must be kept in mind." Another neuropsychologist described the different ways in which the audience changes how their report is written:

> We should have various report styles that meet the needs of our audience. Very short reports with score appendices for our medical colleagues; somewhat more detailed reports for learning disability/ schools if they contract (or families contract) to pay for our writing time; and highly detailed forensic reports where the level of detail is often critical for the forensic process.

These concerns appear to both restrict and push for changes to report-writing styles. One neuropsychologist specifically pointed out that there are unique needs for reports for medical, school, and forensic reports. Furthermore, some neuropsychologists specifically noted keeping the audience in mind while writing reports.

Several (n = 5) of the neuropsychologists who mentioned tailoring reports to the audience discussed tailoring the report to the needs of medical providers specifically. This indicated a sub-category of the larger theme for audiences, entitled *different expectations for medical providers.* For many, it appears that medical providers are a large population that influences report-writing styles. More specifically, some neuropsychologists discussed concerns related to simplifying or writing in plain language as hindering communication between neuropsychologists and medical

providers. For example, one neuropsychologist described how medical purposes require detailed descriptions, and "simplifying documentations can run the risk of complicating communications between medical providers." Two neuropsychologists specifically described the benefits of shorter reports in medical settings. In summary, it appears that neuropsychologists do consider their audience in writing their reports, although medical providers emerged as the most influential audience for report-writing styles.

The present study also yielded quantitative and descriptive information about report characteristics to examine common styles seen among neuropsychologists. Regarding page length, the majority of neuropsychologists reported writing reports between 1-5 or 6-10 pages long. Very few participants endorsed page lengths above 20 pages. Thus, it appears that most neuropsychologists write reports that are 10 pages or less. From the parent perspective, of the six participants, some parents received reports between 6-10 or 11-15 pages. Fewer parents received reports between 1-5 or 31 or more pages. Regarding the summary and recommendations sections specifically, nearly all neuropsychologists indicated that this part of their reports was in the 1–5-page range.

In terms of the included sections, most neuropsychologists consistently endorsed including a background/history section, behavioral observations, testing procedures, list of tests used, test results, summary of findings, and recommendations. Behavioral observations were endorsed by all neuropsychologists. More than half of neuropsychologists also endorsed including record review, a list of diagnoses, and a score appendix, although these were endorsed less consistently. A list of diagnoses was the least frequently endorsed section among neuropsychologists. One participant also reported including a section with the list of norms used for testing.

All the parents in this study endorsed that the reports they received included a test results section. At least two thirds of parents also endorsed that their reports included background/history, behavioral observations, testing procedures, and recommendations. Parents were mixed in their endorsement of a summary section. Fewer parents endorsed that their reports included a record review, a list of tests, a list of diagnoses, or a score appendix. Similar to neuropsychologists, a list of diagnoses was seen least frequently among parents.

With respect to writing format, about two-thirds of neuropsychologist participants reported using a thematic writing format, and only a small number of participants reported writing their results in a test-by-test format. However, neuropsychologists did not answer strictly in these two categories. When further broken down and coded separately, a little more than half endorsed a thematic only format, and about a quarter of participants described using neither format. Very few participants endorsed a strictly test-by-test format or a mixture of these two styles. Thus, most neuropsychologists use a thematic format. Parent participants reported their results most often follow a test-by-test format rather than a thematic result section format.

When examining score inclusion, approximately one third of neuropsychologists included scores specifically in the body of their reports, and 49% included any kind of numbers in the narrative body of their reports. However, more than half of the participants did include scores in an appendix or tables (rather than the body) of the report specifically. Furthermore, confidence intervals were overwhelmingly excluded from both the body and tables of the report. Only one parent responded to the number use question, and that participant stated that their report included numbers. No further information about number use was provided by this parent.

Six neuropsychologists chose to provide free responses about additional report elements. Some neuropsychologists described additional elements related to the results of their report,

including embedding score tables within the body of the report, reducing their results section overall, and including graphic scales. There were also additional elements described for how they wrote their reports. Specifically, one neuropsychologist clarified that they used qualitative descriptors, and another neuropsychologist described using special software for writing and dictation. Two neuropsychologists also described report elements specific to their formats, such as thematic writing and having three different report formats for different presenting concerns/settings.

With regard to writing methods, most neuropsychologists reported using templates while writing their reports. When examining writing time, the largest proportion of neuropsychologists reported writing between 3-4 hours, followed by 1-2 hours and 5-6 hours. Three participants reported writing reports for less than one hour, and seven participants reported writing more than six hours.

In summary, several neuropsychologists described writing reports tailored to their audience in general, although it appears that medical providers are the most influential audience, as they were mentioned most frequently and in the most detail. Neuropsychologists generally reported including most of the major sections of the report found in the literature, although parent responses indicated some variability. Results were mixed regarding page length, with most neuropsychologists writing their reports in ten pages or less, whereas parents most often received reports that were 6-15 pages. Similarly, across parents and neuropsychologists, results were variable regarding the writing format of the results, where most neuropsychologists endorsed a thematic format, while most parents received reports written in a test-by-test format. Neuropsychologists stated that numbers were often included in their reports, although method varied, although this information was unable to be gathered from parents. Most

neuropsychologists report using templates for their reports, and they most often spend four hours or less writing their reports.

Research Question 2: Recommended Changes

Research Question 2 is concerned with the openness of neuropsychologists to changing their report writing styles, specifically the acceptability of suggested changes proposed in the literature, as well as concerns related to changing report-writing. Frequencies and percentages of neuropsychologist responses to acceptability of changes and concerns are summarized in Tables 14 and 15. For those who provided open-ended responses, several neuropsychologists appear to feel the burden of lengthy, comprehensive reports and traditional structures, and some reported experimenting with changes in length and language to communicate more clearly while also increasing efficiency. These responses supported two categories labeled *a need for shorter reports* ("They are too long") and *a desire to reduce time spent writing* ("There are ways to thoroughly assess multiple systems and write much more efficiently").

Some neuropsychologist responses fell into a category *labeled a need for plain language writing,* where many neuropsychologists reported that they would like to see or adopt more plain-language styles of report-writing, as well as shorten their reports (e.g., "I prefer to write one, easy to read report. Saves time and energy. I think all audiences appreciate it"). Neuropsychologists also were asked to rate the acceptability of various changes to report-writing that have been suggested in the literature. Ratings of these potential changes are presented in Table 11. Quantitative responses corroborated a desire for shorter, lower-reading-level reports, as neuropsychologists endorsed reducing the overall reading level, writing specific sections in plain language, and shortening reports overall would be at least somewhat acceptable. These neuropsychologists also felt that they would like to reduce their time spent writing, both in open-

ended responses and quantitative endorsements, indicating this change was at least somewhat acceptable in the quantitative endorsements. One neuropsychologist stated that, "there are ways to assess multiple systems and write much more efficiently" indicating hopes for more efficient writing.

The neuropsychologists in this study also indicated that they would like to see changes in traditional report structures in a category labeled *changing traditional report structure*. For example, two neuropsychologists wrote in open-ended responses that they have altered the order of their report sections (e.g., diagnostic impressions first). One neuropsychologist stated, "I write my report in reverse order with the summary, impressions, and recommendations at the top of the report." Quantitative responses indicated that more than half of these neuropsychologists rated reporting only descriptive ranges rather than scores in the body to be either somewhat or very acceptable. Furthermore, many neuropsychologists found it at least somewhat acceptable to change structures to include a one-page, plain language summary of results, write only in thematic/integrated formats, provide concrete examples of recommendations, and to write in a strengths-based format. One neuropsychologist stated in an open-ended "other" response that they would like to see the test results section removed completely in favor of a more general summary and diagnostic impressions. Thus, it appears that there is openness to changes in report-writing structure to benefit both the audience and the efficiency of their reports. Additionally, a majority of neuropsychologists felt open to gathering feedback from patients about the report, indicating further openness to change. However, neuropsychologists were less interested in reducing their template use. Furthermore, discussion of templates was notably absent from neuropsychologists' qualitative responses.

With respect to concerns about changing report writing, qualitative responses also indicated a category labeled *barriers to changing reports*, which suggested that there appears to be a call for professional organizations to develop recommendations and clearer guidance for report-writing reform, as neuropsychologists are finding it difficult to adjust to this more "new-wave" style of writing. Through open-ended responses, a small subcategory (lack of clarity on how to change), indicated that some neuropsychologists simply are not sure of the best practices to change reports (e.g., "I have found it difficult to get clear guidance in terms of professional standards for report writing that support short reports. It is also confusing as to whether including scores is a good practice"). In addition, one neuropsychologist was also concerned that making these changes may cause harm, stating, "I am all for transparency, but don't want to do harm by including data that may be misinterpreted or misunderstood." Additionally, in quantitatively rated data, about half of these neuropsychologists endorsed concerns with difficulty adjusting to a new writing style. Nonetheless, there appears to be an openness to training and guidance, with most neuropsychologists finding it acceptable to incorporate more training in plain-language writing, and less than half neuropsychologists were concerned about the hindering factors previously discussed in the literature such as compromised professionalism, added writing time, lack of training in plain-language writing, or resistance from providers.

In addition to difficulties suggested in the literature, open-ended responses revealed that insurance reimbursement and monetary barriers serve as somewhat of a conundrum for neuropsychologists as they explore making changes to their report writing. A category entitled *concerns with insurance coverage* emerged based on these responses. Specifically, they are concerned about balancing efficiency, communication, helpfulness, and monetary constraints ("In practice, insurance companies will not generally authorize the amount of time that it would

involve doing 6+ hours of testing, and writing 20+ page reports."). Neuropsychologists reported difficulties related to insurance reimbursement constricting how comprehensive their reports can be, while also serving to push for changes such as shorter, more efficient report-writing. One neuropsychologist also pointed out that insurance reimbursement constraints led to changes in hospital policy that constricted their reports and report-writing time.

Overall, there appear to be some concerns about changing report-writing practices, mainly related to difficulties adjusting and lack of training, and some difficulties related to family perceptions. However, most neuropsychologists are open to change and find many of the changes proposed in the research acceptable with few overall concerns. Additionally, insurance reimbursement serves both as a hinderance and a push for report-writing reform.

Research Question 3: Parent Satisfaction

The final research question is related to parent satisfaction and experiences with neuropsychological reports. Frequencies and percentages are summarized in Tables 16-20. Generally, all parents in the sample reported that they received a copy of their report and a feedback session. There was a significant spread across evaluation settings, which included private practice psychologists, medical private practice (i.e., medical practices with embedded psychologists), medical hospital, academic medical setting, and schools. It should be noted that these were all self-selected by parents who may have had a limited understanding to differentiate between neuropsychologists and other psychologists who conduct evaluations. Referral sources included self, teacher/school, and medical providers. Most parents reported that it took less than one month to receive the report, with one-third waiting 1-3 days, one parent waiting for one week, one-third waiting 2 weeks, and one parent waiting for one month. All these findings

related to parent satisfaction should be judged with caution, however, due to the small sample of parents (6) who participated in this study.

Parents were surveyed about their satisfaction in multiple areas, as well as barriers and experiences with receiving and using the report information and recommendations. In open-ended responses, some parents did describe satisfaction overall with their experiences and understanding of the report they received. One parent specifically reported satisfaction with the diagnosis their child received and how this diagnosis assisted in enacting change in school (i.e., “Turns out she was Dyslexic, and once we started teaching her through a process called "on-sight" reading, she picked it up in a month.”). Most parents were at least somewhat satisfied with the referral question being addressed and diagnoses provided in the report, indicating some areas of positive experiences. However, there also were various negative experiences described in both the quantitative and qualitative responses of parents, including difficulties with implementing the recommendations and barriers to services.

In general, parents wanted more clarity in the content of the report. Specifically, parents requested that neuropsychologists make real-life and clear suggestions within their report to assist families in knowing how to use the report and what to do after receiving the report. These became clear through categories of *more plain language/clarity* and *more real-life examples* that comprised this larger theme. Specifically, several open-ended responses indicated the need for clear, plain-language writing in reports (e.g., “the report was difficult to understand”). One third of parents in this small sample indicated they were at least somewhat satisfied with their understanding of the report, with half of this sample of parents reporting feeling neutral. Two parents felt at least somewhat satisfied with their understanding of their child’s strengths and weaknesses, but another two reported feeling somewhat to extremely dissatisfied in this area.

Further, four parents in open-ended responses indicated the need for more real-life examples within reports, such as more specific recommendations to improve child functioning (e.g., "what should be done in major areas of the child's life to improve their functioning").

In relation to changes that would be helpful to address these concerns, most parents felt they would like to see reduced page lengths and reports written at lower reading levels. Results were mixed regarding adding a plain language summary and providing more examples. A few parents endorsed a desire for thematic formats, bulleted major findings, or strengths-based formats. No parents felt that it would be helpful to remove numbers or add graphs.

Another theme emerged from open-ended responses *entitled difficulties using the report after the fact*. Categories within this report described the problems that parents encountered even after the report was completed, including *wait time problems* ("Then we had to wait one month to get the official report back"), *failures of implementation* ("the suggestions were disregarded by the school psychologist"), and *disagreements with other professionals* ("the school psychologist was absolutely useless"). The category *failures of implementation* further indicated that parents experienced difficulties in implementing the findings and recommendations of the report, and these difficulties included both upstream (difficulties getting the school to implement recommendations) and downstream (parent difficulties implementing recommendations) problems.

Several parents described difficulties implementing the recommendations (e.g., "some recommendations are not very good to implement"). Additionally, some parents in this area specifically indicated difficulties with schools accepting recommendations within the report (e.g., "I had to fight to get my daughter an IEP and then fight every year to get the new teacher to

follow it."). One parent described disagreement with other professionals' conclusions based on the report, which led to further problems with obtaining needed services for their child:

> The school psychologist was absolutely useless. My daughter, doing well in every other subject, who can remember anything spoken to her and repeat it accurately, can't tell the difference between the letters p and b or L and 7 when looking at them, but the psychologist insists theirs nothing wrong with her, she's just lazy! Insane.

Most (two-thirds) parents reported that it was somewhat or extremely difficult to implement recommendations at school.

Difficulties implementing findings from neuropsychological reports were not confined to problems with school implementation. Results were mixed as to the ease of using recommendations at home, with feeling this was somewhat or extremely difficult, neutral, and feeling that it was somewhat easy, each endorsed by roughly one third of participants. Results were also mixed regarding follow-through with recommendations in general, with one third of responses indicating either somewhat difficult, neutral, or somewhat easy. Parents were mostly neutral about obtaining outside services and the overall feasibility. Furthermore, the findings were inconsistent regarding the usefulness of recommendations overall, with being at least somewhat satisfied, feeling neutral, and feeling somewhat dissatisfied each comprising a third of responses. More parents rated that they felt "neutral" regarding the help provided by the report and wait time to receive the report. Overall, it appears that in this small sample, parents are reporting significant difficulties with obtaining help from the provided reports.

In terms of barriers, half of these parents indicated that they experienced difficulties related to a long wait, distances from neuropsychologist location, and inflexibility with schedule. A few parents reported difficulties related to insurance coverage to complete the evaluation,

insurance coverage for outside recommendations, missing work, or missing school. No parents encountered language barriers or problems related to the length it took to receive the report. Thus, it appears there were a few barriers in this sample of parents, but they weren't a problem for most of these parents in this small sample. However, in open-ended responses, one parent included significant details about difficulties related to missing school and work, travel, and wait-time for the report. Specifically, this parented stated, "I had to wait 4 months to get my daughter in for testing, and then had to drive 6 hours one way to get to the facility. She missed school, I missed work, and the test itself took 5 hours to complete. Then we had to wait a month to get the official report back. In the meantime the school was going to have her fail second grade because she couldn't read or write correctly." Previous literature suggested that many parents also experience similar barriers (Delagneau et al., 2020).

In general, there were some positive aspects of reports/recommendations and satisfaction reports. However, there appears to be a call for increased clarity and plain language, as well as further consideration about problems with implementing the findings of the report in daily life. Luckily, few parents experienced significant barriers in the evaluation. While the sample size is small, which affects generalizability of these findings, the perceptions of these parents indicate that there are clear areas of improvement needed within the practice of report-writing.

Exploratory Analyses

Only two participants in the neuropsychologist group uploaded de-identified reports. Both reports appear to be from private practice settings. Given the small number of available reports, only readability statistics could be calculated. One report had an average of 3.2 sentences per paragraph with an average of 17.6 words per sentence. The Flesch Reading Ease was 32.9, and the Flesch-Kincaid Grade Level was 12.6. There were 23.2% passive sentences. The second

report contained an average of 2.1 sentences per paragraph and 18.1 words per sentence. The Flesch Reading Ease Score was 57, and the Flesch-Kincaid Grade Level was 9.7. The report contained 19.6% passive sentences.

Concerning the reported effects of the COVID-19 pandemic, 42.3% of the total sample of neuropsychologists reported that the COVID-19 pandemic impacted their report-writing practices. There were several COVID-related changes noted in open-ended responses, including increased use of technology (e.g., computer-mediated testing, telehealth visits, remote work), changes in workload (e.g., changes in client load, reduced testing hours), added safety measures (e.g., wearing masks, use of plastic shields), adding COVID-related language to reports (e.g., commenting on safety precautions, inclusion of language related to telehealth), and changes in assessment batteries and testing data (e.g., changes in what tests are administered, changes in confidence in results). There were also participants who described logistical and psychological concerns related to the pandemic, such as changes in research plans, difficulties focusing, and problems related to travel. Overall, COVID-19 appears to have impacted neuropsychology practice.

Exploratory analyses were run to examine whether patient population is associated with report page length, writing time, results structure, and number use. Results indicated that patient population is not associated with number use, $\chi^2 = 2.00$, $\phi c = .21$, $p = .736$; results format, $\chi^2 = 14.84$, $\phi c = .33$, $p = .250$; writing time, $\chi^2 = 30.29$, $\phi c = .35$, $p = .175$; or report page length, $\chi^2 = 16.05$, $\phi c = .30$, $p = .886$. Results are summarized in Table 21.

CHAPTER 5

DISCUSSION

The purpose of this study was to expand upon the literature related to neuropsychological reports in general, as well as to add to the paucity of literature related to neuropsychological reports for parents specifically. This study also was conducted to understand neuropsychologists' openness to changing report writing styles in response to issues identified in the existing literature. The final purpose of this study was to assess parent satisfaction with the reports that they received on their children. Regarding the quantitative hypotheses, the first hypothesis, which asserted that neuropsychologist demographics and practice characteristics would influence their report-writing practice, was partially supported. In contrast, hypotheses asserting that assessment report characteristics and family factors would influence parent overall satisfaction with reports were not supported. These are discussed further below.

The primary research question of this study was focused on report writing trends. Overall, these findings suggest that current report characteristics followed many of the report writing trends that have been observed for the past several decades (e.g., Donders, 2001b; Sattler 2014), including similar report page ranges to prior studies (Donders, 2001b; Postal et al., 2018), as well as similar major sections to those described in prior studies (e.g., Donders, 2001b; Sattler, 2014). However, one specific trend was not reflected in the parent sample of this study. Specifically, these parents did not consistently endorse the inclusion of a report summary. A lack of a summary section is surprising, given that this section would traditionally include information explaining findings and summarizing their child's profile. It is especially interesting that these parents did not consistently endorse the inclusion of a summary, given that many report readers in previous studies found the summary to be one of the most useful sections of

their reports (e.g., Nugent et al., 2016; Postal et al., 2018). A lack of this section would presumably negatively impact parents' health literacy for their children. It is possible that this small sample of parents represented exceptions, rather than the norm, or that summary sections existed but were labeled differently and/or the parents were unclear about what the summary section encompassed. A lack of a summary section may hinder parents' understanding of report findings, and it may contribute to difficulties such as problems advocating for their child or difficulty understanding their child's needs. Future research should continue to explore the nature of reports received by parents to help identify the most common report formats, as well as the helpfulness of each section.

Related to perceptions of report format, findings from the neuropsychologists in the present study indicate that they are both frequently utilizing and more open to employing thematic formats in their writing, which other researchers have recommended as a strategy to improve clarity (Groth-Marnat, 2009; Pelco et al., 2009; Rahill, 2018). These are based on results previously described and presented in Tables 13 and 14. Few researchers have examined the frequency of thematic versus test-by-test formats. Donders (2001b) reported that over 88% of their neuropsychologists either routinely or always organized their findings by various skill domains, although it was unclear if this constituted solely thematic formats, so it is difficult to draw comparisons in this limited literature.

There were mixed views on report format between the two samples in the present study. Specifically, most parents in this study reported more frequently receiving test-by-test formats (see Table 13), and they generally did not endorse thematic formats as a change they would find helpful (Table 18), indicating that parents and neuropsychologists may differ in their perceptions of their evaluation reports. However, this is not a direct comparison given the significant

difference in sample size between the two groups, so this discrepancy should be interpreted with caution. Nonetheless, it is interesting to note that there are some differences between the reports received in the two samples. This difference between parent and neuropsychologist reports may be related to a lack of parent understanding of the language used to describe these various formats. It may also be that the small sample size of the parent samples contributed to skewed findings related to report formats. Future researchers should focus on broader samples and use more concrete examples of each report-writing format to ensure parent understanding.

Concerning the inclusion of numbers, findings from the present study indicate that neuropsychologists are inconsistent in their inclusion of numbers within their evaluation reports (see Table 13), although they are more open to reducing the use of numbers (see Table 14). In contrast, parents appear less concerned about the inclusion of scores (see Table 18 for more specific results), so numbers may not have hindered their understanding of the reports they received in this small sample. Nevertheless, while parents did not feel that removing numbers from reports would be necessary when asked about helpful changes, most parents skipped the question asking whether numbers were included in their reports, limiting interpretations of these findings. In contrast to the current study, Donders (2001b) found that the majority of neuropsychologists used numbers within their reports, and referral sources surveyed by Postal and colleagues (2018) found numbers useful. It should be noted that Postal and colleagues asked their participants if they found the inclusion of numbers in the report valuable, and it was not specified whether this included the body, appendices, or both. Thus, whereas some previous researchers expressed concerns about including numbers in reports (Seagull, 1978; Umana et al., 2019), it appears that many researchers feel that the inclusion of scores is acceptable if it is minimal and/or includes proper and consistent context and explanation (Harvey, 2006; Mastoras

et al., 2011; Michaels, 2006; Schoenberg et al., 2018). Because findings of the present study are mixed related to the frequency of the use of numbers and the location of the numbers in the reports, further research may be beneficial to determine the most effective ways to include numbers and scores in reports. Given the small parent sample in this study, as well as only one parent answered whether or not their report contained numbers, it is hard to draw any real conclusions related to parent experiences.

Although limited, two studies revealed that the inclusion of graphs was well-received by report readers (Hollander, 1986; Miller & Watkins, 2010). These researchers utilized examples of reports with graphics, and they assessed how well parents could understand and remember the findings within the reports. Parents in the present study did not feel the need to include graphs in reports (see Table 18); however, they may not have known whether graphics would be helpful if the reports they received did not include them for comparison. Alternatively, parents may have understood the contents well enough without additional graphics for explanation, similar to the findings for number use described above. The two previously mentioned studies are also relatively older, so more recent research may be needed to better clarify the helpfulness of graphic organizers.

Results from the present study indicated that neuropsychologists heavily rely on their templates while writing (see Table 13). Previous research on template use has resulted in conflicting recommendations from the literature to either use templates (Harvey, 2006; Postal et al., 2018) or decrease template use in writing (Axelrod, 2013; Umana et al., 2019). However, such research has also reflected different research methods. Harvey's (2006) recommendations in favor of templates were based on five smaller studies, which included exit interviews of graduate students, excerpts from report examples in textbooks, and surveys, and Postal and colleagues

(2018) surveyed neuropsychologists. Axelrod (2013) conducted a book review of a neuropsychologist toolkit and Umana and colleagues (2019) conducted a review focusing on teachers, leading to recommendations against templates. In sum, it appears that researchers surveying neuropsychologists directly, like the present study, have found that neuropsychologists prefer to use templates. In contrast, researchers using more indirect methods (e.g., reviews on teachers, books) recommend reductions in template use. These neuropsychologists were not interested in decreasing their use of templates. The costs and benefits of template use is an area of further research that could help develop clearer guidance and best practices for the use of templates.

Findings indicate that the neuropsychologists in the present sample spend as much time writing reports as neuropsychologists studied in previous research (see Table 13). Specifically, most neuropsychologists in this sample reported typically completing their writing in four hours or less, although there appears to be significant variation in writing times overall. This is consistent with prior research that found similar numbers of writing hours for most neuropsychologists, including significant variation overall (Postal et al., 2018; Rabin et al., 2005; Whitaker, 1994). Thus, it appears that this variability in writing times has existed over time based on the results of the present study and prior literature. Relatedly, parents in this study have experienced consistent wait times for their evaluation reports as seen in two previous studies (Kirkwood et al., 2017; Postal et al., 2018; see Table 20) further indicating that the hours spent writing assessments reports have remained relatively stable over the years.

There appear to be several broad factors that influence the previously discussed report characteristics. First, neuropsychologists' open-ended responses suggest that they aim to appropriately address different audiences in their assessment reports ("the audience must be kept

in mind"), which is in line with suggestions from several prior researchers (cf. Harvey, 2006; Sattler, 2014). Medical providers were mentioned most often in these open-ended responses, suggesting that they are a particularly influential audience for neuropsychologists. This is not surprising, considering that many prior studies on neuropsychological reports have been focused on physicians (e.g., Lee Bishop et al., 2003; Postal et al., 2018; Mahoney et al., 2017; Temple et al., 2006; Tremont et al., 2002). Furthermore, findings from this study suggest that neuropsychologists are hesitant to make their reports more reader-friendly, as several neuropsychologists expressed that they believed that reducing reading levels could affect their communication with their most influential audience (i.e., physicians). This reluctance to incorporate plain language is in direct contrast to some previous studies that have found medical providers would appreciate more plain-language writing in the reports they receive (Mahoney et al., 2017; Postal et al., 2018). Nonetheless, most of these neuropsychologists (see Table 14) and parents (see Table 18) expressed that reducing the reading levels of their reports would be a positive change, indicating that reading levels may be a problem with the current assessment reports. There may be a need to clearly define what constitutes acceptable plain-language writing, as what is considered effective plain language will likely vary for different audiences.

Neuropsychologists in this sample recognized that shortening the page lengths of their reports would benefit their most influential audience (i.e., physicians), which falls in line with general suggestions to shorten reports across prior studies conducted examining physicians' perceptions of evaluation reports (Mahoney et al., 2017). Shorter reports have also been suggested for other settings and audiences (e.g., Baum et al., 2018; Mastoras et al., 2011; Seagull, 1978; Sweet et al., 2015; Tharinger et al., 2008; Zimmerman & Jucks, 1983). Thus, the

present study also provides evidence that neuropsychologists would benefit from writing shorter reports.

In this study, findings suggest that more experienced neuropsychologists tend to spend less time writing reports, which provided partial support for hypothesis one suggesting that neuropsychologist characteristics would be related to report writing styles (see Tables 7 and 9). These findings are also consistent with those of Whitaker (1994), who found that writing time reduces with years of experience. Thus, it appears that more practiced neuropsychologists can complete reports in less time than their novice counterparts, indicating that increased practice in writing may be beneficial in improving efficiency. Future researchers may further explore associations between board certification, experience, and report writing characteristics such as writing time. Furthermore, in this study, practice setting was associated with writing time, where the shortest reports/times were seen within medical settings and university training clinics (see Table 8). Such settings often have practicum students, interns, and postdoctoral fellows who might be contributing to neuropsychologists' assessments and report-writing. Previous researchers have also found some associations between page length and practice settings, most often with medical settings tending to have shorter reports (Donders, 2001b). These findings suggest that there are expectations or other factors affecting assessment reports that vary by setting, and further research may be beneficial to understand the purpose that these different expectations serve across different settings.

It appears that some report characteristics may be amenable to change based on the responses from the neuropsychologists in this sample (see Table 14). However, there were several areas in which these parents and neuropsychologists disagreed on what changes would be beneficial (e.g., strengths-based format, inclusion of numbers), suggesting that

neuropsychologists may not appreciate the difficulties that parents have with their evaluation reports (see Tables 14 and 18), and thus they may not understand which changes may be most beneficial. It also may be that these parents were unfamiliar with the terms used in this survey or could not picture what such changes would entail. This type of survey may not be the most effective means of gathering parent or other layperson feedback about reports. For example, sample reports might be provided such that participants may directly compare reports with and without examples of different report elements to more accurately assess whether parents' preferences. No studies were found in which researchers directly compared changes that each population would find acceptable or helpful. Further research is needed in this area to ensure that changes to reports are helpful to various stakeholder groups.

This study adds to the small amount of literature (e.g., Postal et al., 2018) regarding concerns that neuropsychologists may have with making changes to their reports (see Table 15). Specifically, neuropsychologists in this sample would like to see more training in plain language writing, and updated guidance from the literature and professional organizations would be beneficial to assist them in best adjusting to a new style of writing. Examining open-ended survey responses, Postal and colleagues (2018) identified distinct barriers to change, including perceptions of compromised comprehensiveness, lack of feeling that there is a need for change, and believing (although not supported) that their audiences want comprehensive reports. Although the previous study overlapped some with the concerns found in that study, these neuropsychologists appeared more concerned with the sheer difficulty and confusion related to making changes to their reports and report-writing. There is certainly room for more research on what truly is the best practice of report-writing, and how it may vary by audience, and such research will inform the subsequent development of guidelines.

Insurance reimbursement was a secondary concern related to changing report writing. Specifically, these neuropsychologists were concerned that insurance constraints on billable hours conflicted with their ability to provide comprehensive reports for their audience. Insurance reimbursement is also a strong motivator for more efficient writing to reduce writing time and ensure that billing maximums are not reached. Previous researchers also have pointed out that insurance reimbursement may be a push for less writing time (Baum et al., 2018; Kanauss et al., 2005; Sweet et al., 2003). Thus, healthcare reimbursement provides a unique challenge for how to balance efficient writing with comprehensive and helpful content. Future research may target how to best achieve this balance between efficiency and comprehensiveness.

Parents also provided some insights into their overall experiences reading and using neuropsychological reports, and more specific results can be found in Tables 16-17). Findings indicate that parents in this study experienced transparent processes for accessing results after the completion of the evaluation. However, previous literature related to the provision of physical reports and feedback sessions has been inconsistent (Bennett-Levy et al., 1994; Donders, 2001b; Donofrio et al., 1999; Smith et al., 2007). This discrepancy in parent experiences may be related to the small sample size of the present study, but it also may be related to study recency, as the older studies (Bennett-Levy et al., 1994; Donders, 2001b; Donofrio et al., 1999) reported inconsistencies in whether patients received their report and/or a feedback session. In the most recent previous study (Smith et al., 2007), most psychologists conducted feedback sessions.

Parents in the present study described how they were most satisfied with aspects of the report that answered specific questions about their child. This is similar to some prior research that found report readers were satisfied with the diagnoses (Pei et al., 2011; Temple et al., 2006) and referral questions (Mahoney et al., 2017; Temple et al., 2006). However, these parents were

not consistently satisfied with any other aspect of their evaluation process. Although some previous studies have suggested that parent satisfaction was affected by different report structures (Hite, 2017), lower readability levels (Bucknavage, 2007; Hite, 2017; Hopper, 1977; Rahill, 2018; Tharinger et al., 2008), and family characteristics (Kirkwood et al., 2017), this was not true in the present sample, so hypotheses two and three were not supported. However, the lack of quantitative findings may be due to the exceedingly small parent sample size, which limits both the range of characteristics that can be tested and statistical power. Some methodological differences also may have contributed to these different findings, such as the use of experimental methods rather than surveys (Bucknavage, 2007; Hite, 2017), solely reviewing the literature (Tharinger et al., 2008), or focusing on psychoeducational reports (Bucknavage, 2007; Hite, 2017; Hopper, 1977; Rahill, 2018). This study included similar methods to the study conducted by Kirkwood and colleagues (2017), although they focused on patients who sustained a pediatric traumatic brain injury, whereas no parents in the present sample reported a medical reason for referral. Thus, the small sample size and/or this difference in the sample may have contributed to variable findings. Nonetheless, these findings may indicate that other factors not assessed in the present study may be impacting parents' satisfaction, and future research should examine other factors to understand what characteristics may be most impactful to address parent concerns.

The parents in this study appeared unable to easily and consistently implement the recommendations provided with evaluation reports, especially in schools. This is consistent with limited previous literature indicating some difficulties with follow-through in schools (Dreyer et al., 2010). Furthermore, previous studies also indicated inconsistent and mixed findings related to outcomes after the evaluation (Blechschmidt, 2016; Delagneau et al., 2019; Elias et al., 2020),

as well as significant and variable difficulties with the implementation of recommendations (Blechschmidt, 2016; D'Amato & Dean, 1987; Elias et al., 2020; Keenan et al., 2019; Mucka et al., 2018; Singh et al., 2009; Westervelt et al., 2007). Further research is needed relating to the types of recommendations that have the best follow through and what makes following through on recommendations so challenging.

This study yielded information about some of the barriers to follow through on recommendations and other general barriers to receiving an evaluation, specifically indicating some problems for parents with access to services both before and after a neuropsychological evaluation (see Table 19). Little research has been focused on the barriers faced by families during the evaluation process (Blechschmidt, 2016; Delagneau et al., 2019), and this study provides some support for the findings of prior researchers indicating barriers with access to services and the implementation of recommendations. However, the small number of parents makes it difficult to draw more definitive conclusions. Thus, more research is needed to better understand and address these barriers.

Exploratory Analyses

This study also included several exploratory analyses. First, two sample reports were received from private practice neuropsychologists. Readability statistics indicated that those reports were written at a 9th-grade level or above and the average Flesch Reading Ease score of 44.95 indicated that they were difficult to read, according to interpretation guides from prior literature (Spadaro et al., 1980). Overall, the two sample reports were in line with previous research indicating high reading grade levels (Baum et al., 2018; Harvey, 1997; Jones & Gross, 1959; Singh et al., 2009; Weddig, 1984) and that reports are often difficult to read (for a review, see Groth-Marnat & Horvath, 2006). However, although these results are consistent with

previous literature that suggests a common problem, only two reports were obtained, and they were both conducted in the same setting (i.e., private practice). Thus, these results should be interpreted with caution.

Exploratory analyses also were used to examine the qualitative data related to the effects of the COVID-19 pandemic on neuropsychological practice. Less than half of the neuropsychologists checked "yes" to indicate that they experienced a change in their report-writing practices following the pandemic. However, only a few of the COVID-related follow-up open-ended responses were specific to report-writing. Such responses were centered around changing language in reports, such as including qualifying language in their reports to address the safety precautions (e.g., masks) that led to non-standard testing procedures. There were also neuropsychologists who described safety procedures in their reports or included language about telehealth. This is in line with recommendations provided from several resources to explicitly describe possible threats to standardization (Patel et al., 2021; Wright et al., 2020).

Beyond report-writing, these neuropsychologists appeared concerned about maintaining standardized testing procedures and the subsequent validity of results during the COVID-19 pandemic. Neuropsychologists described changing test batteries to accommodate safety precautions and/or the use of technology. One neuropsychologist also described having less confidence in the validity of their results. Finally, several neuropsychologists in this study experienced significant changes in workload, but these varied by the neuropsychologist. Specifically, some neuropsychologists cited reduced workload due to fewer patients being seen for evaluation. In contrast, other neuropsychologists experienced an influx in testing and increased work hours due to the pandemic. Overall, it appears that slightly less than half of the

neuropsychologists in this sample experienced changes because of the pandemic, but these considerations are important for contextualizing reports for the years to come.

The final exploratory analyses examined the relationship between patient population and report characteristics (see Table 21). As described above, previous researchers found that age groups are related to report characteristics (i.e., page length) such that pediatric reports are often longer than reports for older patient populations (Donders, 2001b; Postal et al., 2018). The present study also examined whether the patient population was related to report length in addition to other report and writing characteristics (e.g., number use, results format, and writing time). However, in contrast to previous literature, there were no associations between patient population and report characteristics.

Donders (2001a; 2001b) and Postal and colleagues (2018) also utilized survey methods; however, there was some variability in patient population distributions across studies. Specifically, the present study had a slightly smaller proportion of pediatric/child-focused neuropsychologists than Postal and colleagues' study, but a much larger proportion than in Donders' study. Both Donders and Postal and colleagues also had larger proportions of adult-focused and geriatric-focused neuropsychologists. The present study also had substantially fewer participants, as compared to 726 (Postal et al., 2018) and 414 (Donders, 2001a; 2001b) participants. Finally, the studies also surveyed the patient population and report characteristics differently. Donders (2001a) asked participants to list the percentage of time that they work with each age group, rather than select their most frequently seen population. Donders also surveyed page length in a continuous rather than ordinal fashion. Further, while Postal and colleagues (2018) surveyed the patient population in the same manner as the present study, they asked participants to fill in their average page length for each patient population rather than select an

ordinal response for their average page length overall. This difference in population distribution, small sample size, and/or differences in measurement could be related to the variation in findings.

Clinical Implications

There are several considerations that can be drawn from this study to inform future reports and report-writing scholarship. Many of these neuropsychologists appear open to increasing the efficiency of report-writing while improving readability, with special consideration for communication with medical providers. Neuropsychologists may consider shortening their reports while re-evaluation what pieces of information are the most important and salient while writing their reports. Whereas some of these neuropsychologists were concerned that reduced reading levels may impair communication with physicians, most neuropsychologists were open to making these changes. Parents discussed how they would benefit from reduced reading levels and increased clarity in neuropsychological reports, so it would be beneficial for neuropsychologists to begin considering their report reading levels. A first step would be to use readability statistics available on their word processing software as a preliminary estimate of their reports' reading levels. Neuropsychologists may then consider what proportions of their reports may be rewritten to include more plain language. This would also include evaluating what terms or jargon may be replaced for simpler language or may need additional explanation to communicate with audiences more effectively.

Neuropsychologists would benefit from considering barriers that their patients may face when attempting to implement recommendations, and they also may benefit from gathering patient feedback on their services. There does not appear to be a pressing need for neuropsychologists to reduce their number use, although some have suggested greater

explanation of the numbers that are presented. Further, neuropsychologists may experiment with more thematic or skills-based report formats, although this appears to be less of a priority for parents.

Neuropsychologists should consider the impacts of health literacy overall. Parents may already struggle with health literacy, as a large proportion of the population exhibits difficulties with health literacy (for a review, see the National Action Plan to Improve Health Literacy, 2010). Neuropsychologists' writing styles, including high reading grade levels, or confusing formats, may negatively affect parents' ability to be actively engaged in health-related decision-making for their children. To mitigate these effects, neuropsychologists should follow the suggestions of the National Action Plan to Improve Health Literacy (2010) to effectively communicate information in a way that makes the information more usable by families, as this plan describes the responsibility of healthcare providers to ensure the health literacy of their patients.

Strengths of this Study

This research assisted in addressing the paucity of literature related to parents' experiences with and perceptions of neuropsychological reports. Few researchers (Austin et al., 2019; Bodin et al., 2007; Farmer & Brazeal, 1998; Kirkwood et al., 2017) have explored neuropsychological reports from a parents' perspective specifically, with more studies focused on perceptions of medical providers. Thus, this study adds parent perspectives to the small body of literature.

This study also sampled from a wide population in its utilization of social media recruitment. The wide reach of social media, as opposed to potential participants available

through a university or hospital setting, allowed me to reach a wider participant population. Thus, these results may be more generalizable to the overall population.

The mixed-method design of the present study provides a unique perspective on report-writing research. Many previous researchers utilized quantitative survey methods with little to no qualitative data. The mixed-methods approach allowed for significance testing of various relationships. The open-ended responses provided more in-depth parent and neuropsychologist data yielding unique and varied insights that would not have been possible with a strictly quantitative survey. Qualitative analyses also provided additional considerations that may not have otherwise been explored, such as specific concerns related to communication with medical providers.

The survey method also allowed me, as a researcher independent of the assessment process, to obtain unique perspectives directly from parents. Postal and colleagues (2018) described a disconnect that occurs when consumers are surveyed directly by the neuropsychologists who conduct their child's evaluations. This removed, remote survey allowed parents to provide a more honest description of their experiences. This may not have been possible if parents were surveyed directly by neuropsychologists or within neuropsychologist offices. These participants also had time to reflect on their experiences, given the time lapse between the evaluations and this data collection.

In this study, I also surveyed neuropsychologists on the acceptability of various proposed changes and provided open-ended opportunities to discuss their related ideas and concerns. Neuropsychologists' perspectives are largely absent from the literature, with few studies examining acceptability and willingness to change (Postal et al., 2018). Gaining this perspective provides valuable information on how reports might be improved. Understanding

neuropsychologist concerns can assist in informing changes and understanding how to approach implementing changes.

Limitations and Future Directions

This study should be interpreted with caution considering its limitations. First, the present study included a small sample size that limits the statistical analysis and generalizability of the results, especially in the severely underpowered parent sample. Specifically, the small sample limited the available statistical analyses, including logistical regression, which may have been more powerful in detecting small effects. Future researchers should recruit larger samples to replicate and extend these findings. This sample was also not very diverse, both in terms of identity and professional characteristics. For example, this study also included mostly white participants in both groups. In the neuropsychologist sample, there was not much variability in the clinical populations (e.g., few geriatric and lifespan specialists) or levels of training (e.g., intern or fellow level). Additionally, these neuropsychologists mostly worked in private practice, medical hospitals, and academic medical settings, with other settings representing much smaller numbers of neuropsychologists. These sample characteristics may limit the generalizability of these findings. When the pandemic recedes, in-person recruitment options via practice settings, hospitals, conferences, etc., may assist in recruiting a larger and more representative sample.

Restricting the non-neuropsychologist sample to parents limited audience perspectives on neuropsychological reports. Many other audiences may need to read and use neuropsychological assessment reports, and the field would benefit from understanding all stakeholder perspectives to enact change more efficiently and effectively. Future studies may include or specifically target the experiences of other stakeholder groups (e.g., teachers, patients). Further research on medical providers may be beneficial, specifically surveying changes they would find helpful.

The self-report methods also introduced some limitations to this study. Self-reports are inherently a subjective measure of parent and neuropsychologist experiences, and this subjectivity may limit the generalizability and objective accuracy of the results. Additionally, there were only two sample reports provided for this study, which limited objective measurement. Future researchers may rectify this issue by gathering and analyzing sample reports instead of asking questions about their report writing.

The ordinal and nominal nature of these data limited the availability of statistical analyses to non-parametric measures. This measurement may have limited the specificity of certain findings (e.g., page length). Future studies may turn to report samples, more open-ended responses, or interview methods to gain more specific data for each participant and broaden the available statistical analyses.

The participants in the parent sample notably did not identify medical concerns as the reasons for referral. Given that neuropsychologists primarily focus on brain dysfunction (Lezak et al., 2012), and many work in medical settings, it is surprising that medical conditions were not a concern for families. It may be that families were referred for concerns secondary to existing medical conditions and/or brain dysfunction. Thus, future studies may add additional screening questions and methods to ensure that their parent samples consist of those who received true neuropsychological reports rather than psychological or psychoeducational reports.

Conclusion

There is a push for neuropsychologists to consider adjusting their report-writing to be more helpful to their audiences. The present study provides some insights into how neuropsychologists are currently writing their reports. These report characteristics were largely independent of many neuropsychologist and parent/family characteristics. These results also

brought light to the difficulties that parents faced with implementing recommendations. It is unfortunate that parents in this sample struggled to use the information in their neuropsychological reports to help their children, which runs counter to the original purpose of receiving an evaluation. The neuropsychologists in this study were somewhat set in their ways related to their report-writing (e.g., use of templates). However, the present study revealed that there were many areas where neuropsychologists felt willing to adjust their report writing style, and it is important to capitalize on this willingness to push forward in the field of report writing. Future research is needed to expand upon the present findings and to develop clear guidelines to create impactful change.

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EXHIBITS

Table 1

Descriptive Data for Neuropsychologist Variables (N=71)

Characteristic	*Neuropsychologists*	
	n	%
Gender		
Male	30	42.25
Female	40	56.34
Transgender	1	1.41
Race/Ethnicity		
Caucasian/White	59	83.10
African American/Black	3	4.23
Hispanic/Latinx	2	2.82
Asian American	4	5.63
Native American or Alaska Native	2	2.82
Self-Identify	1	1.41
Practitioner Status		
Board-Certified Neuropsychologist	17	23.94
Licensed Clinical Psychologist	27	38.03
Neuropsychology Trainee – Graduate Student	21	29.58
Neuropsychology Trainee – Predoctoral Intern	2	2.82
Neuropsychology Trainee – Postdoctoral Fellow	4	5.63
Patient Populations		
Pediatric/Child	21	29.58
Adult	32	45.07
Geriatric	12	16.90
Lifespan	5	7.04

Other	1	1.41
Assessment Setting		
Private Practice	26	36.62
Medical Hospital	15	21.13
Psychiatric Hospital	1	1.41
Integrated Care Setting	4	5.63
Veterans Affairs	3	4.23
Academic Medical Setting	15	21.13
University Training Clinic	7	9.86
Houston Guidelines [a]	63	90.00
Board-Certified [a]	18	25.35
	M	*SD*
Age	36.73	11.31
Years in Practice	9.98	8.94

[a] denotes the number and percentages of participants who answered "yes"

Table 2

Chi-square Tests of Association for Neuropsychologist Demographics (N=71)

Practitioner Status	*Board Certified Neuropsychologist*		*Licensed Clinical Psychologist*		*Neuropsychology Graduate Student*		*Neuropsychology Predoctoral Intern*		*Neuropsychology Post-doctoral Fellow*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%		
Patient Population												
Pediatric/ Child	3	16.67	6	33.33	6	33.33	1	5.56	2	11.11		
Adult	6	21.43	13	46.43	9	32.14	0	0	0	0		
Geriatric	3	27.27	3	27.27	3	27.27	1	9.09	1	9.09	.54	.313
Lifespan	4	80.00	1	20.00	0	0	0	0	0	0		
Other	1	100	0	0	0	0	0	0	0	0		
Practice Setting												

Private Practice	5	21.74	12	52.17	3	13.04	2	8.70	1	4.35		
Medical Hospital	5	38.46	2	15.38	5	38.46	0	0	1	7.69		
Psychiatric Hospital	1	100	0	0	0	0	0	0	0	0		
Integrated Care Setting	0	0	3	75.00	1	25.00	0	0	0	0	.63	.405
Veteran's Affairs	0	0	2	100	0	0	0	0	0	0		
Academic Medical Setting	5	35.71	3	21.43	5	35.71	0	0	1	7.14		
University Training Clinic	1	16.67	1	16.67	4	66.67	0	0	0	0		

Table 3

Chi-square Tests of Association for Board Certification and Neuropsychologist Demographics (N=71)

Practitioner Status	*Board-Certified*		*Not Board Certified*		χ^2	*p-value*
	n	%	*n*	%		
Years in Practice						
1-5 years	1	5.88	16	53.33		
6-10 years	4	23.53	12	40.00		
11-15 years	2	11.76	0	0		
					23.79	<.001
16-20 years	2	11.76	1	3.33		
21-25 years	4	23.53	0	0		
26-30 years	3	17.65	1	3.33		

More than 30 years	1	5.88	0	0		
Practice Setting						
Private Practice	5	27.78	18	40.00		
Medical Hospital	5	27.78	8	17.78		
Psychiatric Hospital	1	5.56	0	0		
Integrated Care Setting	0	0	4	8.89	6.47	.373
Veteran's Affairs	1	5.56	1	2.22		
Academic Medical Setting	5	27.78	9	20.00		
University Training Clinic	1	5.56	5	11.11		

Table 4

Frequency Data for Parent Demographic Variables (N=7)

Characteristic	*Parents*	
	n	%
Gender		
Male	4	57.14
Female	2	28.57
Transgender	1	14.29
Race/Ethnicity		
White/Caucasian	5	71.43
Native American or Alaska Native	2	28.57
Reason for Referral		
Learning Difficulties	4	66.67
Attention Difficulties	3	42.86
Social Difficulties	2	28.57
Language Difficulties	1	14.29
Medical Concerns	0	0
Other	7	100
Family Income		
Under $15,000	1	14.29
$15,000-$24,999	2	28.57
$75,000-$99,999	1	14.29
$100,000-$149,999	2	28.57
$200,000 and above	1	14.29
Highest Level of Education		
Some High School	1	14.29
Some College	1	14.29
Associate's Degree or Certificate/Technical Program	2	28.57

Master's Degree	2	28.57
Completed Graduate/Professional School	1	14.29
Evaluation Setting		
Private Practice Psychologist	1	16.67
Medical Private Practice	2	33.33
Medical Hospital	1	16.67
Academic Medical. Setting	1	16.67
School	1	16.67
Referral Source		
Self	1	16.67
Teachers/School	2	33.33
Medical Providers	3	50.00
	M	SD
Age of Child at Evaluation	8.00	5.18
Number of Years Ago Report Received	7.33	7.28
Parent Age	38.57	16.23
Number of Children in Household	2.86	2.48
Number of Children who Received a Report	1.71	1.11

Table 5

Chi-square Tests of Association for Parent Demographics – Income (N=6)

Income	*Under $15,000*		*$15,000-$24,999*		*$75,000-$99,999*		*$100,000-$149,000*		*$200,000 and above*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%		
Education Level												
Some High School	1	100	0	0	0	0	0	0	0	0		
Some College	0	0	0	0	1	100	0	0	0	0		
Associate's or Certificate/ Technical Program	0	0	2	100	0	0	0	0	0	0	1.80	.121
Master's Degree	0	0	0	0	0	0	1	50	1	100		
Completed Graduate/ Professional School	0	0	0	0	0	0	1	50	0	0		

Number of Children (Ordinal)												
1 child	0	0	1	50	0	0	1	50	0	0		
2 children	0	0	1	50	1	100	0	0	1	100	1.04	.475
4 or more children	1	100	0	0	0	0	1	50	1	0		

Table 6

Chi-square Tests of Association for Parent Demographics – Number of Children (N=6)

Number of Children	*1 child*		*2 children*		*4 or more children*		χ^2	*p-value*
	n	%	*n*	%	*n*	%		
Education Level								
Some High School	0	0	0	0	1	100		
Some College	0	0	1	100	0	0		
Associate's or Certificate/ Technical Program	1	50	1	50	0	0	1.80	.417
Master's Degree	1	50	1	50	0	0		
Completed Graduate/ Professional School	0	0	0	0	1	100		

Table 7

Hypothesis 1 Kendall's Tau Correlations (N = 46)

	1	2	3
1. Years in Practice	--		
2. Writing Time	-.25*	--	
3. Page Length	-.30*	.33**	--

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 8

Chi-square Tests of Association for Practice Setting (N = 46)

	Private Practice		*Medical Hospital*		*Integrated Care Setting*		*Veterans Affairs*		*Academic Medical Setting*		*University Training Clinic*		*Psychiatric Hospital*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%		
Number Use																
Yes	6	37.50	4	50	2	66.67	1	50	6	42.86	2	66.67	--	--	1.62	.899
No	10	62.50	4	50	1	33.33	1	50	8	57.14	1	33.33	--	--		
Report Format																
Thematic Format	10	62.50	6	75	1	33.33	0	0	8	57.14	2	66.67	--	--	14.57	.483
Test-By-Test	1	6.25	1	12.50	0	0	0	0	2	14.29	0	0	--	--		
Mixture	2	12.50	0	0	1	33.33	0	0	0	0	0	0	--	--		

Neither	3	18.75	1	12.50	1	33.33	2	100	4	28.57	1	33.33	--	--		
Writing Time																
Less than 1 hour	2	8.70	0	0	0	0	0	0	1	7.14	0	0	0	0		
1-2 hours	4	17.39	4	30.77	3	75	1	50	4	28.57	3	60	0	0		
3-4 hours	8	34.78	4	30.77	0	0	0	0	8	57.14	0	0	1	100		
5-6 hours	7	30.43	3	23.08	0	0	1	50	0	0	1	20	0	0	34.43	.543
7-8 hours	0	0	2	15.38	1	25	0	0	1	7.14	0	0	0	0		
9-10 hours	1	4.35	0	0	0	0	0	0	0	0	1	20	0	0		
More than 10 hours	1	4.35	0	0	0	0	0	0	0	0	0	0	0	0		

Page Length																
1-5 pages	3	18.75	5	62.50	1	33.33	1	50	10	71.43	0	0	--	--		
6-10 pages	8	50	2	25	0	0	1	50	2	14.29	3	100	--	--		
11-15 pages	3	18.75	1	12.50	0	0	0	0	1	7.14	0	0	--	--		
16-20 pages	2	12.50	0	0	0	0	0	0	0	0	0	0	--	--	51.33**	.009
21-25 pages	0	0	0	0	0	0	0	0	1	7.14	0	0	--	--		
26-30 pages	0	0	0	0	1	33.33	0	0	0	0	0	0	--	--		
31+ pages	0	0	0	0	1	33.33	0	0	0	0	0	0	--	--		

** $p < .01$

Table 9

Chi-square Tests of Association for Board Certification (N = 46)

	Board Certified		*Not Board Certified*		χ^2	*p-value*
	n	%	*n*	%		
Number Use						
Yes	5	35.71	16	50	.80	.371
No	9	64.29	16	50		
Report Format						
Thematic Format	10	71.43	17	53.13		
Test-By-Test	1	7.14	3	9.38	2.09	.554
Mixture	0	0	3	9.38		
Neither	3	21.43	9	28.13		
Writing Time						
Less than 1 hour	3	16.67	0	0	15.29*	.018
1-2 hours	7	36.84	12	27.27		

3-4 hours	6	33.33	15	34.09		
5-6 hours	1	5.56	11	25		
7-8 hours	0	0	4	9.09		
9-10 hours	0	0	2	4.55		
More than 10 hours	1	5.56	0	0		
Page Length						
1-5 pages	9	64.29	11	29.73		
6-10 pages	3	21.43	13	40.63		
11-15 pages	2	14.29	3	9.38		
					5.44	.489
16-20 pages	0	0	2	6.25		
21-25 pages	0	0	1	3.13		
26-30 pages	0	0	1	3.13		
31+ pages	0	0	1	3.13		

* $p < .05$

Table 10

Chi-square Tests of Association for Ordinal Practice Years (N = 46)

	1-5 years		*6-10 years*		*11-15 years*		*16-20 years*		*21-25 years*		*26-30 years*		*30+ years*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%		
Number Use																
Yes	6	54.55	4	40	1	50	1	33.33	2	50	2	66.67	0	0	2.05	.915
No	5	45.45	6	60	1	50	2	66.67	2	50	1	33.33	1	100		
Report Format																
Thematic Format	6	54.55	5	50	1	50	3	100	1	25	2	66.67	1	100	12.95	.795
Test-By-Test	0	0	2	20	0	0	0	0	1	25	0	0	0	0		
Mixture	1	9.09	2	20	0	0	0	0	0	0	0	0	0	0		
Neither	4	36.36	1	10	1	50	0	0	2	50	1	33.33	0	0		

Table 11

Chi-square Tests of Association for Parent Satisfaction and Report Characteristics (N = 6)

	Extremely Dissatisfied		*Somewhat Dissatisfied*		*Neither*		*Somewhat Satisfied*		*Extremely Satisfied*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%		
Number Use												
Yes, in the body	--	--	--	--	1	100	--	--	--	--	--	
Report Format												
Thematic Format	--	--	--	--	1	25	1	100	0	0	2.63	.269
Test-By-Test	--	--	--	--	3	75	0	0	1	100		
Understanding												
Extremely Dissatisfied	--	--	--	--	--	--	--	--	--	--		
Somewhat Dissatisfied	--	--	--	--	1	25	0	0	0	0		
Neither	--	--	--	--	2	50	1	100	0	0	7.00	.321
Somewhat Satisfied	--	--	--	--	1	25	0	0	0	0		
Extremely Satisfied	--	--	--	--	0	25	0	0	1	100		

Page Length												
1-5 pages	--	--	--	--	1	25	0	0	0	0		
6-10 pages	--	--	--	--	1	25	0	0	1	100		
11-15 pages	--	--	--	--	1	25	1	100	0	0		
16-20 pages	--	--	--	--	--	--	--	--	--	--	4.50	.609
21-25 pages	--	--	--	--	--	--	--	--	--	--		
26-30 pages	--	--	--	--	--	--	--	--	--	--		
31+ pages	--	--	--	--	1	25	0	0	0	0		
Overall Feasibility												
Extremely Difficult	--	--	--	--	--	--	--	--	--	--		
Somewhat Difficult	--	--	--	--	2	50	0	0	0	0		
Neither	--	--	--	--	2	50	1	100	0	0	7.00	.136
Somewhat East	--	--	--	--	0	0	0	0	1	100		
Extremely Easy	--	--	--	--	--	--	--	--	--	--		

Table 12

Chi-square Tests of Association for Parent Satisfaction and Barriers (N = 6)

	Extremely Dissatisfied		*Somewhat Dissatisfied*		*Neither*		*Somewhat Satisfied*		*Extremely Satisfied*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%	*n*	%		
Parent Education												
Some College	--	--	--	--	0	0	1	100	0	0		
Associate's Degree or Certificate/Professional Program					2	50	0	0	0	0	8.25	.220
Master's Degree	--	--	--	--	1	25	0	0	1	100		
Graduate/Professional School	--	--	--	--	1	25	0	0	0	0		
Number of Children												
1 child	--	--	--	--	1	25	0	0	1	100		
2 children	--	--	--	--	2	50	1	100	0	0	3.25	.517
3 children	--	--	--	--	--	--	--	--	--	--		
4 or more children	--	--	--	--	1	25	0	0	0	0		
Wait Time												
Extremely Dissatisfied	--	--	--	--	2	50	0	0	0	0	7.00	.136
Somewhat Dissatisfied	--	--	--	--	--	--	--	--	--	--		

Neither	--	--	--	--	2	50	0	0	1	100		
Somewhat Satisfied	--	--	--	--	0	0	1	100	0	0		
Extremely Satisfied	--	--	--	--	--	--	--	--	--	--		
Long Wait												
Yes	--	--	--	--	3	75	0	0	0	0	3.00	.223
No	--	--	--	--	1	25	1	100	1	100		
Distance												
Yes	--	--	--	--	3	75	0	0	0	0	3.00	.223
No	--	--	--	--	1	25	1	100	1	100		
Insurance for Evaluation												
Yes	--	--	--	--	1	25	0	0	0	0	.60	.741
No	--	--	--	--	3	75	1	100	1	100		
Insurance for Recommendations												
Yes	--	--	--	--	1	25	0	0	0	0	.60	.741
No	--	--	--	--	3	75	1	100	1	100		
Inflexibility of Scheduling												
Yes	--	--	--	--	3	75	0	0	0	0	3.00	.223
No	--	--	--	--	1	25	1	100	1	100		

Missing Work												
Yes	--	--	--	--	1	25	0	0	0	0	.60	.741
No	--	--	--	--	3	75	1	100	1	100		
Missing School												
Yes	--	--	--	--	1	25	1	100	0	0	2.63	.269
No	--	--	--	--	3	75	0	0	1	100		
Language Barriers												
Yes	--	--	--	--	--	--	--	--	--	--	--	--
No	--	--	--	--	--	--	--	--	--	--		
Other Barriers												
Yes	--	--	--	--	--	--	--	--	--	--	--	--
No	--	--	--	--	--	--	--	--	--	--		

Table 13

Research Question 1: Frequencies for Report Characteristics and Writing Trends

	Neuropsychologists		*Parents*	
	n	%	*n*	%
Page Length				
1-5 pages	20	43.48	1	16.67
6-10 pages	16	34.78	2	33.33
11-15 pages	5	10.87	2	33.33
16-20 pages	2	4.35	--	--
21-25 pages	1	2.17	--	--
26-30 pages	1	2.17	--	--
31+ pages	1	2.17	1	16.67
Summary and Recommendations Page Length				
1-5 pages	46	86.79	--	--
6-10 pages	6	11.32	--	--
11-15 pages	0	0	--	--
16 or more pages	1	1.89	--	--
Included Sections [a]				
Background/History	40	86.96	4	66.67
Record Review	32	69.57	2	33.33
Behavioral Observations	46	100	4	66.67
Testing Procedures	34	73.91	4	66.67
List of Tests	38	82.61	2	33.33
Test Results	41	89.13	6	100
Summary	43	93.48	3	50
List of Diagnoses	23	50	1	16.67
Recommendations	41	89.13	5	83.33
Score Appendix	32	69.57	2	33.33

Other Sections	1	2.17	--	--
Writing Format [a]				
Thematic Format	30	65.22	2	33.33
Test-by-Test	7	15.22	4	66.67
Scores in the Body	16	34.78	--	--
Scores in Tables	27	58.70	--	--
Percentiles in the Body	15	32.61	--	--
Percentiles in Tables	17	36.96	--	--
Confidence Intervals in the Body	2	4.35	--	--
Confidence Intervals in Tables	2	4.35	--	--
Template Use	33	71.74	--	--
Other	6	13.04	--	--
Number Use in the Body [a]	21	45.65	1	100
Results Format				
Thematic	27	58.70	--	--
Test-by-Test	4	8.70	--	--
Mixture	3	6.52	--	--
Neither	12	26.09	--	--
Writing Time				
Less than 1 Hour	3	4.84	--	--
1-2 Hours	19	30.65	--	--
3-4 Hours	23	33.87	--	--
5-6 Hours	17	19.35	--	--
7-8 Hours	5	6.45	--	--
9-10 Hours	2	3.23	--	--
More than 10 Hours	1	1.61	--	--

[a] denotes number and percentage of participants who indicated that they do include these sections

Table 14

Research Question 2: Frequencies for Neuropsychologist Perceptions of Proposed Changes (N = 53)

	Very Unacceptable		*Somewhat Unacceptable*		*Neutral*		*Somewhat Acceptable*		*Very Acceptable*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Reducing Overall Reading Level	3	5.66	3	5.66	4	7.55	19	35.85	24	45.28
Writing Plain Language Sections	2	3.77	2	3.77	6	11.32	13	24.53	30	56.60
Incorporate Training/ Education in Plain Language Writing	3	5.77	0	0	9	17.31	17	32.69	23	44.23
Reduce Template Use	9	16.98	10	18.87	15	28.30	13	24.53	6	11.32
Shorten Reports	2	3.85	3	5.77	1	1.92	19	36.54	27	51.92
Reduce Writing Time	2	3.77	2	3.77	3	5.66	19	35.85	27	50.94
Exclude Numbers in the Body	3	5.66	10	18.87	9	16.98	9	16.98	22	41.51
Other	0	0	0	0	0	0	1	33.33	2	66.67
Adding a Plain-Language Summary	2	3.77	6	11.32	10	18.87	15	28.30	20	37.74
Writing in Integrated Formats Only	2	3.77	6	11.32	5	9.43	11	20.75	29	54.72
Providing Real-Life Examples	3	5.66	2	3.77	5	9.43	11	20.75	32	60.38
Adding a Bulleted Summary	1	1.89	4	7.55	14	26.42	16	30.19	18	33.96
Writing Strengths-Based	1	1.92	4	7.69	13	25.00	20	38.46	14	26.92

Gathering Feedback from Patients	2	3.85	6	11.54	13	25.00	10	19.23	21	40.38
Other	0	0	1	16.67	2	33.33.	1	16.67	2	33.33

Table 15

Research Question 2: Neuropsychologist Endorsed Concerns with Proposed Changes (N = 71)

	Frequencies of Those Who Endorsed Concerns	
	n	%
Compromised Professionalism	17	32.08
Added Writing Time	23	43.40
Lack of Training	15	28.30
Difficult to Adjust	28	52.83
Resistance from Other Providers	13	24.53
Resistance from Supervisors	12	22.64
None	5	9.43
Other	4	7.55

Table 16

Research Question 3: Frequencies for Parent Satisfaction (N = 6)

	Extremely Dissatisfied		*Somewhat Dissatisfied*		*Neither*		*Somewhat Satisfied*		*Extremely Satisfied*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
General Understanding	--	--	1	16.67	3	50	1	16.67	1	16.67
Understanding Child's Strengths/ Weaknesses	1	16.67	1	16.67	2	33.33	1	16.67	1	16.67
Addressing the Referral Question	--	--	--	--	2	33.33	2	33.33	2	33.33
Help Provided	--	--	1	16.67	4	66.67	1	16.67	--	--
Usefulness of Recommendations	--	--	2	33.33	2	33.33	1	16.67	1	16.67
Diagnoses	--	--	--	--	1	16.67	3	50	2	33.33
Wait Time	2	33.33	--	--	3	50	1	16.67	--	--
Other Help	--	--	--	--	1	50	1	50	--	--
Overall Satisfaction	--	--	--	--	4	66.67	2	33.33	--	--

Table 17

Research Question 3: Frequencies for Parent Satisfaction (N = 6)

	Extremely Difficult		*Somewhat Difficult*		*Neither*		*Somewhat Easy*		*Extremely Easy*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Use Recommendations at Home	1	16.67	1	16.67	2	33.33	2	33.33	--	--
Implement Recommendations at School	1	16.67	3	50	1	16.67	1	16.67	--	--
Obtaining Outside Services	--	--	1	16.67	5	83.33	--	--	--	--
Following Through on Recommendations	--	--	2	33.33	2	33.33	2	33.33	--	--
Overall Feasibility	--	--	2	33.33	3	50	1	16.67	--	--

Table 18

Research Question 3: Changes Parents Feel Would be Helpful

	Parents who Endorsed Changes would be Helpful	
	n	%
Reduce Length	4	66.67
Write Sections at a Lower Level	4	66.67
Add a One Page Summary	3	50
Thematic Reports	2	33.33
Bullet Major Findings	2	33.33
Provide Examples	3	50
Writing in a Strengths-Based Format	2	33.33
Add Graphs	0	0
Remove Numbers	0	0
Other	0	0

Table 19

Research Question 3: Barriers Experienced by Parents

	Parents who Endorsed the Following Barriers	
	n	%
Long Wait for Appointment	3	50
Distance from Appointment	3	30
Insurance to Complete Evaluation	1	16.67
Insurance for Recommendations	1	16.67
Inflexibility with Scheduling	3	50
Missing Work	1	16.67
Missing School	2	33.33
Language Barriers	0	0
Other Barriers	0	0
Problems from Wait Time	0	0

Table 20

Research Question 3: Parent Experiences Following Evaluation

	Parents who Endorsed the Following Experiences	
	n	%
Length of Time to Receive Report		
1-3 Days	2	33.33
1 Week	1	16.67
2 Weeks	2	33.33
1 Month	1	16.67
Received Report [a]	6	100
Received a Feedback Session [a]	6	100

[a] denotes parents who endorsed receiving the following

Table 21

Chi-square Tests of Association for Patient Population (N = 46)

	Pediatric/Child		*Adult*		*Geriatric*		*Lifespan*		χ^2	*p-value*
	n	%	*n*	%	*n*	%	*n*	%		
Number Use										
Yes	7	46.67	7	41.18	4	40	2	66.67	2.00	.736
No	8	53.33	10	58.82	6	60	1	3.33		
Report Format										
Thematic Format	10	66.67	6	35.29	9	90	2	66.67	14.84	.250
Test-By-Test	2	13.33	2	11.76	0	0	0	0		
Mixture	0	0	3	17.65	0	0	0	0		
Neither	3	20	6	35.29	1	10	1	33.33		
Writing Time										
Less than 1 hour	0	0	0	0	2	18.18	1	20	30.29	.175
1-2 hours	3	16.67	12	44.44	1	9.09	2	40		

3-4 hours	5	27.78	7	25.93	8	72.73	1	20		
5-6 hours	6	33.33	5	18.52	0	0	1	20		
7-8 hours	2	11.11	2	7.41	0	0	0	0		
9-10 hours	1	5.56	1	3.70	0	0	0	0		
More than 10 hours	1	5.56	0	0	0	0	0	0		
Page Length										
1-5 pages	4	26.67	8	47.06	6	60	1	33.33		
6-10 pages	7	46.67	4	23.53	4	40	1	33.33		
11-15 pages	2	13.33	2	11.76	0	0	1	33.33		
									16.05	.886
16-20 pages	2	13.33	0	0	0	0	0	0		
21-25 pages	0	0	1	5.88	0	0	0	0		
26-30 pages	0	0	1	5.88	0	0	0	0		
31+ pages	0	0	1	5.88	0	0	0	0		

** $p < .01$

APPENDIX A

NEUROPSYCHOLOGIST SURVEY

1. Please note your current practitioner status:
    a. Board certified neuropsychologist
    b. Licensed clinical psychologist (not board certified)
    c. Neuropsychology trainee – graduate student
    d. Neuropsychology trainee – predoctoral intern
    e. Neuropsychology trainee – postdoctoral fellow
2. What is your age (in years)?
3. What is your gender?
    a. Cisgender Male
    b. Cisgender Female
    c. Transgender
    d. Non-binary, gender fluid, gender queer
    e. Self-identify (please specify)
4. What is your race/ethnicity?
    a. White/Caucasian
    b. African American/Black
    c. Hispanic/Latino
    d. Asian American
    e. Native American or Alaska Native
    f. Bi- or Multi-racial
    g. Self-identify (please specify)

5. Has COVID-19 impacted your report writing practices?
    a. Yes (please describe)
    b. No
6. Please describe any changes to your *current* practice as a result of the COVID-19 pandemic.
7. How many years have you been in practice?
8. Have you met, or are you working to meet, Houston Conference Guidelines for training in neuropsychology. This entails:
    a. Knowledge bases in generic psychology core, generic clinical core, foundations of brain-behavior relationships, and foundations for practice of clinical neuropsychology.
    b. Skills in assessment, treatment and interventions, consultation, research, and teaching and supervisions
    c. Training through doctoral training in clinical (neuro)psychology, internship training in clinical neuropsychology, post-doctoral residency education and training in clinical neuropsychology for at least 2 years, and continuing education in clinical neuropsychology.
    d. Yes
    e. No
    f. Don't know
9. Are you board-certified?
    a. Yes (If yes, by which board?)
    b. No

10. What type of setting do you currently conduct assessments in most often?

    a. Private Practice

    b. Medical Hospital

    c. Psychiatric Hospital

    d. Integrated Care Setting

    e. VA

    f. Academic Medical Setting

    g. University Training Clinic

    h. School

    i. Other (please indicate)

11. What type of patient population do you see most often?

    a. Pediatric

    b. Adult

    c. Geriatric

    d. Lifespan

    e. Forensic

    f. Other (please specify)

12. On average how many hours do you spend writing a report?

    a. Less than 1

    b. 1-2 hours

    c. 3-4 hours

    d. 5-6 hours

    e. 7-8 hours

f. 9-10

g. More than 10 hours

13. The following questions ask about your typical report-writing practices. If you submit a de-identified copy of the report, you will be exempt from these questions. You will also earn an extra entry into the gift card drawing. Would you be willing to include a de-identified copy of an example report?

    a. Yes

    b. No

    c. If Yes:

"I, the participant, verify that I have fully redacted this report of all identifying information and have the appropriate policies in place to be able to paste redacted reports for inclusion in this study. My understanding of this data collection is for analysis of doctoral student, Zsofia Imre, M.A.'s dissertation in partial fulfillment of the requirements for the degree of Doctorate of Clinical Psychology (Ph.D.) from Southern Illinois University Carbondale.

My understanding is that this data collection will analyze the reading grade level and report characteristics (i.e., page length, inclusion of numbers, writing format) of the redacted report. The neuropsychological report which I send for inclusion in this study will be redacted of all identifying information prior to being sent to the student. Please see below for suggestions for maintaining confidentiality through de-identification.

I also understand that my identity will remain confidential by participating in this study as there I have also redacted my own information from the report prior to including it in this study. All

reports will be encrypted. Upon completion of this dissertation, all information stored will be disposed of following APA compliant procedures.

By clicking next and signing below, I agree to the above information regarding policies in place for the use of redacted patient information as well as confidentiality and anonymity for this study.

a. I understand and agree to these terms

b. I do not understand or agree to these terms

Suggestions for redacting reports:

- Replace all names of people (including your own) with fictional names
- Replace all locations (e.g., schools practice settings, offices) with fictional places
- Remove sentences containing any background information in the history that is uniquely identifying
- Remove date of birth
- Remove day and month of testing and report completion

Please refer to HIPAA guidelines: https://www.hhs.gov/hipaa/for-professionals/privacy/special-topics/de-identification/index.html"

- I understand and agree to these terms
- I do not understand or agree to these terms

Please copy and paste the link into a new window to upload a file of your de-identified report. Further instructions for uploading are provided there. Before closing out of this current Qualtrics survey, please click continue to finalize your responses. Afterwards, you will be directed to a separate survey to record contact information for entry into the drawing for a $25 Amazon gift card. In the contact survey, you will be asked to indicate whether you uploaded a de-identified support and a provide a physical signature to the letter of support to earn an extra entry. https://www.dropbox.com/request/qcq7G0ySjhnar4Rks01L

If no, the following questions are presented instead:

14. On average, how long is your typical report page length (not including score appendices)?
    a. 1-5
    b. 6-10
    c. 11-15
    d. 16-20
    e. 21-25
    f. 26-30
    g. 31+
15. On average, how long is your typical page length for your summary and recommendations section combined?
    a. 1-5
    b. 6-10

c. 11-15

d. 16+

16. Please select whether these sections are typically included in your report (select all that apply):

    a. Background/history

    b. Review of records

    c. Behavioral observations

    d. Testing procedures

    e. List of assessments used

    f. Test results

    g. Summary

    h. List of diagnostic codes

    i. Recommendations

    j. Score appendix

    k. Other (please describe)

17. Please select all that apply to your reports, in general:

    a. I write in a thematic format (e.g., by skill area)

    b. I write my results in a test-by-test format

    c. I include standardized scores (e.g., standard, scaled, T-scores) in the body of my report

    d. I include standardized scores (e.g., standard, scaled, T-scores) in a score appendix

    e. I include percentiles (e.g., standard, scaled, T-scores) in the body of my report

    f. I include percentiles (e.g., standard, scaled, T-scores) in a score appendix

g. I include confidence intervals (e.g., standard, scaled, T-scores) in the body of my report
h. I include confidence intervals (e.g., standard, scaled, T-scores) in a score appendix
i. I use a template for writing my reports
j. Other notable elements of your report (please specify)

18. Researchers have provided some suggestions to change common report-writing trends. Please rate each of the following suggested changes related to writing practices in terms of how acceptable they are to you (Very Acceptable, somewhat acceptable, neutral, somewhat unacceptable, very unacceptable matrix)
    a. Reduce the overall reading level of the report (i.e., write all in plain language)
    b. Writing specific sections in plain language/lowered reading level (e.g., summary, recommendations)
    c. Incorporate training and education related to plain-language report writing
    d. Reduce template use
    e. Shorten Reports
    f. Reduce time spent writing reports
    g. Do not include scores/confidence intervals/ percentile rank in the body of the report and only report descriptive ranges
    h. Other (explain)
19. Please rate each of the following suggested changes related to format in terms of how acceptable they are to you (Very Acceptable, somewhat acceptable, neutral, somewhat unacceptable, very unacceptable)

a. Adding a one-page, plain language summary detailing the important points
b. Writing reports in thematic/integrated formats (e.g., by skill area), rather than test-by-test
c. Providing examples and more concrete, real-life explanations within recommendations
d. Adding bulleted summaries of major findings for the entire report at the beginning of the report
e. Writing in a strengths-based format
f. Gathering feedback from clients/patients regarding the report
g. Other (please explain)

20. What concerns do you have with making changes to the way you write reports? Please select all that apply:
    a. Comprised professionalism
    b. Adding time to report writing
    c. Lack of training in plain-language report writing
    d. Difficulties in adjusting well-practiced modes of report writing
    e. Resistance from other providers
    f. Resistance from supervisors
    g. None of the above
    h. Other (please indicate)
21. Are there any other changes to report-writing practices that you would consider helpful?
22. Is there anything I didn't ask that you would like to add about report-writing practices?

23. Thank you for Participating in this Survey! Upon submitting your responses, you will be directed to a new survey to input your contact information. You will also be asked a verification question to confirm that you participated in this survey. Please write "neuropsychological reports by neuropsychologists" in this box. Contact information will be used to enter you in a drawing for one of three available $25 Amazon gift cards. Winners will also be notified via this contact information, and e-gift cards will be sent to provided email addresses.

APPENDIX B

PARENT SURVEY

1. What is your age (in years)?
2. What is your race/ethnicity?
    a. White/Caucasian
    b. African American/Black
    c. Hispanic/Latino
    d. Asian American
    e. Native American or Alaska Native
    f. Pacific Islander
    g. Bi- or Multi-racial
    h. Self-identify (please specify)
3. What is your gender?
    a. Male
    b. Female
    c. Transgender
    d. Non-binary, gender fluid, gender queer
    e. Self-identify (please specify)
4. What is your highest education level?
    a. Some high school
    b. High school/GED
    c. Some college
    d. Completed an associate's degree or certificate/technical program

e. Completed a bachelor's degree

f. Some graduate school

g. Master's degree

h. Completed graduate/professional school (e.g., Ph.D., JD, MD)

5. What is your current family income level?

    a. Under $15,000

    b. $15,000-$24,999

    c. $25,000-$34,999

    d. $35,000-4$49,999

    e. $50,000-$74,999

    f. $75,000-$99,999

    g. $100,000-$149,999

    h. $150,000-$199,999

    i. $200,000 and above

6. How many children are currently in. your household?

7. Did your child have a neuropsychological evaluation/report?

    a. Neuropsychological reports are reports that:

        i. Are about brain-based medical disorders (e.g., epilepsy, brain tumor) and/or neurodevelopmental disorders (e.g., Autism Spectrum Disorder, Attention-Deficits/Hyperactivity).

        ii. AND

        iii. Either the report or psychologist title say "neuropsychologist"/"neuropsychological"

b. Yes

c. No

8. How many of the children under your care have received an evaluation?
9. What was the age (in years) of your child at the time of their evaluation?
10. How many years ago, or what year, did you receive your child's report?
11. Please check the reason(s) you sought an evaluation for your child (check all that apply):
    a. Learning difficulties (for example, problems with reading, writing, and/or math)
    b. Attention and/or Hyperactivity/Impulsivity difficulties (for example, ADHD)
    c. Autism Spectrum Disorder
    d. Language disorder
    e. Medical difficulties (for example, Epilepsy, Traumatic brain injury or concussion, Cancer/chemotherapy, Brain tumor/cyst, Cerebral palsy, Neurofibromatosis, Tourette's/tic disorder)
    f. Other (please specify)
12. Please rate each of the following for how satisfied you were with these aspects of the evaluation (Matrix: extremely dissatisfied, somewhat dissatisfied, nether satisfied nor satisfied, extremely satisfied):
    a. General understanding/comprehension (readability, jargon) of the report
    b. Understanding or insight of your child and their strengths/weaknesses
    c. Reason for evaluation was addressed appropriately (answered the referral question)
    d. Help provided by the evaluation for your child
    e. Usefulness of the recommendations

f. Diagnoses provided

g. Wait-time or waitlist for the first neuropsychological appointment

h. Other (please specify)

13. Please rate each of the following on how easy they were (Matrix: Extremely difficult, somewhat difficult, neither easy nor difficult, somewhat easy, extremely easy):

a. Use the strategies suggested at home

b. Implement the recommendations in school

c. Get outside services suggested in the report

d. Following through on recommendations, in general

14. Which of these changes to reports do you think would be most helpful (select all that apply):

a. Reduce the overall reading level of the report (i.e., write all in plain language)

b. Writing specific sections in plain language/lowered reading level (e.g., summary, recommendations)

c. Adding a one-page, plain language summary detailing the important points

d. Reports in thematic/integrated formats (e.g., by skill area), rather than test-by-test

e. Adding bulleted summaries of major findings for the entire report at the beginning of the report

f. Providing examples and more concrete, real-life explanations within recommendations

g. Writing in a strengths-based format

h. Adding graphs to make results more interpretable to a lay audience

i. Not including numbers in the body of the report

j. Other (please indicate)

15. Please describe any other ways neuropsychologists may make improvements in their reports to be more helpful.
16. Did any of the following difficulties get in the way of your child's assessment? Select all that apply:
    a. Long waiting list for an appointment/testing session
    b. Distance from facility where neuropsychologist worked
    c. Insurance or financial concerns to complete the evaluation
    d. Insurance or financial concerns to seek recommended services
    e. Inflexibility with scheduling the assessment
    f. Missing work to take the child to the appointment
    g. Missing school for you or the child
    h. Language barriers/English is my second language
    i. Other:
17. How long did it take to receive the report after your child finished testing?
    a. Less than 1 day
    b. 1-3 days
    c. 4-6 days
    d. 1 week
    e. 2 weeks
    f. 3 weeks
    g. A month
    h. Six weeks

i. Two months

j. Three months

k. Four months

l. Five months

m. Six months

n. More than six months

18. Did you have any difficulties/problems because of how long it took to finish the evaluation?

    a. Yes (please explain)

    b. No

19. How satisfied are you with neuropsychological report(s) you received. For example, was it easy to use the suggestions? Was the report readable?

20. Is there anything we didn't ask that you think would be important to understanding parent experiences reading and using reports?

21. Where did the evaluation take place?

    a. Private Psychological Practice

    b. Private Medical Practice

    c. Medical Hospital

    d. Psychiatric Hospital

    e. Academic Medical Setting

    f. University Training Clinic

    g. School

    h. Other (please indicate)

22. Who referred you for an evaluation?

    a. Self (parent)

    b. Teachers/School

    c. Medical Providers

    d. Case manager/social worker

    e. Therapist/Counselor

    f. Legal system

    g. Other (please indicate)

23. Did the psychologist meet with you to go over the results of testing and the report?

    a. Yes

    b. No

24. Did you receive a copy of the report?

    a. Yes

    b. No

25. Are you currently able to access a copy of the report?

    a. Yes

        i. Please get the report to answer the following questions about the report itself, if available.

    b. No

        i. Would you like to attempt the following questions asking about your report characteristics?

            1. Yes

            2. No

26. Approximately how many pages (not including any score appendices) was the report?

    a. 1-5
    b. 6-10
    c. 11-15
    d. 16-20
    e. 21-25
    f. 26-30
    g. 31+

27. What were the major sections/headings in the report (select all that apply)?

    a. Background/history
    b. Review of records
    c. Behavioral observations
    d. Testing procedures
    e. List of assessments used
    f. Test results
    g. Summary
    h. List of diagnostic codes
    i. Recommendations
    j. Score appendix

28. How were the test results described in your child's report (commonly in the "results" sections of the report)

    a. Test by Test discussed (for example, headings with the title of a test)
    b. By Content/skill area (for example, memory, intelligence, etc.)

c. A mixture (please describe)

29. Did the psychologist include numbers/scores within the body of your child's report (within the text/writing)?
    a. Yes, in the body of the report
    b. Yes, in a score appendix to the report
    c. Yes, in both the body of the report and score appendix
    d. No
30. Thank you for Participating in this Survey! Upon submitting your responses, you will be directed to a new survey to input your contact information. You will also be asked a verification question to confirm that you participated in this survey. Please write "neuropsychological reports for parents" in this box. Contact information will be used to enter you in a drawing for one of three available $25 Amazon gift cards. Winners will also be notified via this contact information, and e-gift cards will be sent to provided email addresses.

VITA

Graduate School
Southern Illinois University Carbondale

Zsofia Imre

Zsofia.imre@siu.edu

University of Central Florida
Bachelor of Science, Psychology, May 2017

Southern Illinois University Carbondale
Master of Arts, Psychology, December 2019

Dissertation Paper Title

Experiences with Writing and Reading Neuropsychological Reports: Neuropsychologist and Parent Perspectives

Major Professor: Dr. Michelle Kibby