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Publisher: Psychology Press

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The Clinical Neuropsychologist

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/ntcn20>

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Version of record first published: 09 Aug 2010.

To cite this article: Jacobus Donders (2001): A Survey of Report Writing by Neuropsychologists, II: Test Data, Report Format, and Document Length, *The Clinical Neuropsychologist*, 15:2, 150-161

To link to this article: <http://dx.doi.org/10.1076/clin.15.2.150.1902>

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A Survey of Report Writing by Neuropsychologists, II: Test Data, Report Format, and Document Length*

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ABSTRACT

Data are presented regarding current practices in the organization of neuropsychological reports, based on a representative sample of 414 US members of Division 40 of the American Psychological Association. The vast majority of the sample included some numeric test data in their reports, either within the text or as an addendum. The nature of the most predominant age groups and diagnostic categories served by neuropsychologists was of prominent influence on variables such as the frequency of utilization of age- and grade-equivalent scores, the inclusion of specific diagnostic codes, the provision of narrative recommendations, and the practice of deferring report distribution until after review with the patient or family. In addition, greater involvement with forensic evaluations in a medicolegal context through private practice tended to increase length of reports. It is concluded that, although there are many areas of consensus in the field with regard to the organization of neuropsychological reports, the final product needs to be shaped on the basis of consideration of the clinical presentation of the patient as well as the needs and knowledge base of the target audience.

This paper describes the second component of a two-part series regarding the results of a survey of a random sample of members of Division 40 of the American Psychological Association who were all more than one-year post attainment of the doctoral degree. Previously, it was demonstrated that, although there are many similarities among various neuropsychologists in terms of what information they typically include in neuropsychological reports, variables such as age group (e.g., pediatrics), diagnostic category (e.g., forensic), and reimbursement structure (e.g., medicolegal) have a significant impact on how elaborately and frequently specific items of information are included in such documents (Donders, in press). Whereas the latter paper dealt with report content, the current presentation will focus on the format and length of the

neuropsychological reports that were typically completed by the respondents in the final sample ($n=414$), with special attention to the issue of inclusion of specific test data.

METHOD

Analyses

The specific survey questions, sample selection methods and procedures have been described previously (Donders, in press). With one exception, all survey items required a four-fold forced-choice response: 'never', 'occasionally', 'routinely', or 'always'. Consistent with the previous investigation, formal statistical analyses were limited to survey items that showed the greatest variability in distribution of responses ($>10\%$ in both extreme directions), and to subgroups that were of sufficient

* This research was supported by a grant from the Campbell Foundation.

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Accepted for publication: February 13, 2001.

size (>10% of the sample) to ensure sufficient power. It was again planned to determine how the distribution of responses to survey items was influenced by the following variables: primary practice setting (private, $n = 194$; medical, $n = 137$; rehabilitation, $n = 63$), primary patient age group (>50% adult, $n = 217$; >50% geriatric, $n = 76$; >50% pediatric, $n = 55$), primary diagnostic category (>50% neurological, $n = 243$; >50% psychiatric, $n = 46$; >50% forensic, $n = 44$), primary reimbursement structure (>50% commercial insurance, $n = 114$; >50% Medicaid/Medicare, $n = 87$; >50% medicolegal, $n = 59$), board certification (with, $n = 80$; without, $n = 334$), and supervision of interns and/or residents (involved, $n = 232$; not involved, $n = 182$).

Chi-square was used to analyze group differences on discrete variables, supplemented by inspection of the odds ratio (OR). Minimal acceptable levels of $p < .01$ and $OR > 2$ were specified a priori, consistent with the previous investigation.

Analysis of variance was used to investigate group differences on continuous variables. Because of the fact that large sample sizes may result in seemingly impressive p values that do not necessarily reflect clinical significance, evaluation of effect size (η^2) was included in these analyses, consistent with recent recommendations (Cicchetti, 1998). There are many opinions on what is a minimally acceptable value of η^2 , and most authors agree that this decision should be guided by theoretical considerations regarding the relevance of the data (Murphy & Myers, 1998; Stevens, 1992; Thompson, 2000). In order to make sure that neither trivial results would be unduly emphasized, nor modest but potentially informative patterns ignored, it was determined a priori that η^2 should exceed a value of .05 (reflecting more than 5% of the variance explained). Thus, regarding any continuous variables, this paper will only report findings that met the combined criteria of (a) $p < .01$ for the main effect, and (b) univariate effect size of $\eta^2 > .05$.

RESULTS AND DISCUSSION

Psychometric Test Data

The only item in this survey that required a two-fold forced-choice response from participants was the statement that 'no numeric scores are provided' in their reports, either in the body of the text or as part of an addendum. The vast majority ($n = 367$, 88.65%) of this sample responded 'false' to this statement, but there

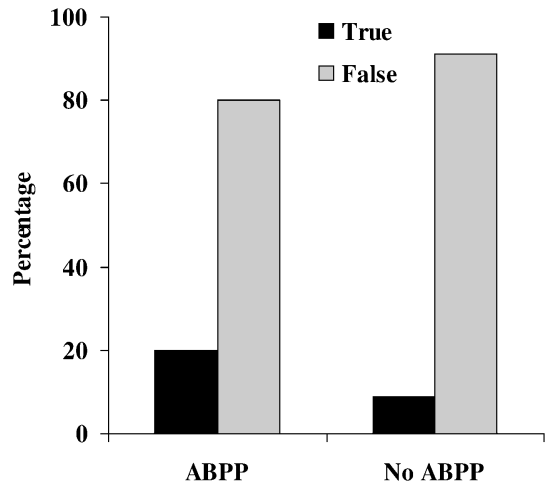


Fig. 1. Responses to the statement that no numeric scores are to be provided in neuropsychological reports, by board certification status.

was a sizeable minority ($n = 47$, 11.35%) that indicated that this was 'true' with regard to their report writing habits. There were no statistically significant differences between these two groups in variables such as employment setting, patient age, diagnostic category, reimbursement characteristics, and involvement with supervision ($p > .01$ on all variables). At the same time, there was a statistically significant main effect of board certification, $\chi^2(1, N = 414) = 7.37$, $p < .01$. These data are presented in Figure 1. ABPP diplomates were more than twice as likely than other neuropsychologists were to endorse this statement in the 'true' direction, $OR = 2.44$ (90% confidence interval = 1.40–4.26). It should be realized that this involved only a minority of board-certified neuropsychologists ($n = 16$, 20%) in this sample. This is compatible with previously described results regarding specification of the utilized norms for psychometric data, which also showed a minority of board-certified neuropsychologists never mentioning this information in reports (Donders, in press). Considered in concert with those previous findings, it appears that, among ABPP diplomates, there is a relatively greater polarity of opinions with regard to the desirability of including specific psychometric and normative data in reports than among the rest of the Division 40 membership.

The desirability of including specific test information in neuropsychological reports is an issue that has been vigorously debated in the field in recent years (Axelrod, 2000; Donders, 1999; Freides, 1993; Matarazzo, 1995; Naugle & McSweeney, 1995, 1996). Resolution of this controversy has not been helped by the fact that the very organization that encourages its members to maintain test security and to guard against the unqualified use of psychometric data has published a book (Pope, Butcher, & Seelen, 1993) that includes very detailed, item-specific information about one of the most commonly used personality tests and that is widely available to the public at large. Lees-Haley and Courtney (2000) have recently recommended that a multi-disciplinary panel should be formed to develop reasonable policies and procedures regarding the maintenance and disclosure of psychological test information. The results from the current survey suggest that until such 'reasonable' guidelines are available, there is no compelling argument to suggest that inclusion of client-specific psychometric or normative data in neuropsychological reports is inconsistent with the standard of practice in the field. This does not mean that inclusion of such information is mandatory under all circumstances. The decision should rest with the individual report writer. He/she should consider the main purpose of the evaluation and the most likely target audience of the report. An even more important consideration is what kind of psychometric data are included in the written documentation regarding neuropsychological assessments.

Table 1 presents data for the 367 participants who did not agree with the statement that no

psychometric data of any kind should be included in neuropsychological reports. Inspection of this table suggests that the majority of these participants frequently included standard scores and/or percentile ranks in their reports, whereas raw scores were used far more sparingly and were in fact eschewed by almost a third of these respondents. This is compatible with the fact that raw scores on many measures are far more difficult to interpret than indexes that provide information about how the individual's performance compares to that of his/her peers. As several participants pointed out in the 'comments' section to this survey, there are some important exceptions to this general rule (e.g., the number of categories completed on the Wisconsin Card Sorting Test or the number of errors on the Test of Memory Malingering). However, for the most part, standard scores and percentile ranks appear to be the measures of choice when reporting specific results of neuropsychological evaluations, at least for data that have a distribution that does not deviate grossly from normal. Less than 10% of this subsample used the 'other' category regarding test score information included in reports. The most frequently mentioned scores in this regard included the Neuropsychological Deficit Scale, developed by Reitan and Wolfson (1992, 1993), which are actually classifications of level of impairment rather than test scores.

There was considerable variability with regard to the utilization of age and grade equivalents. Although more than 10% of this subsample indicated that they always included such scores in their reports, almost 13% reported that they never did so. Employment setting, diagnostic

Table 1. Percentages of Inclusion of Test Scores in Neuropsychological Reports.

| Survey item | N | O | R | A |
|-----------------------|-------|-------|-------|-------|
| Standard scores | 4.09 | 20.16 | 46.87 | 28.88 |
| Percentile ranks | 2.18 | 23.16 | 45.50 | 29.16 |
| Raw scores | 30.52 | 49.32 | 15.26 | 4.90 |
| Age/grade equivalents | 12.81 | 47.14 | 29.70 | 10.35 |
| Other (specify) | 92.37 | 2.18 | 2.45 | 3.00 |

Note. Data based on 367 participants who did not exclude all psychometric data from reports. N = never; O = occasionally; R = routinely; A = always.

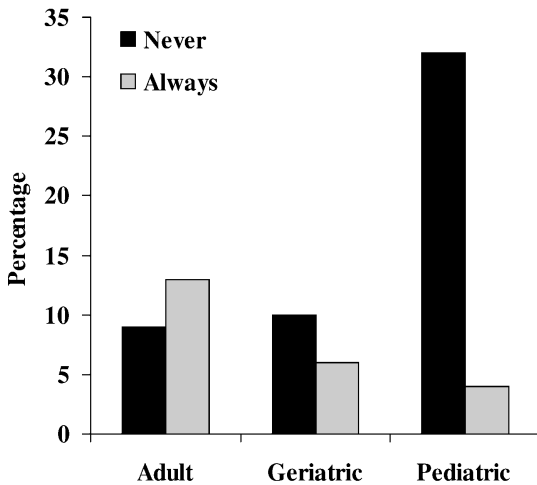


Fig. 2. Frequency of utilization of age- and grade-equivalent scores in neuropsychological reports, by primary age group served.

category, reimbursement structure, board certification, and involvement with supervision did not have a statistically significant impact on these distributions ($p > .10$ on all variables). At the same time, there was a statistically significant effect of primary patient age group on the practice of never including these types of scores, $\chi^2(2, N = 308) = 19.84$, $p < .0001$. These data are presented in Figure 2. Participants who had a predominantly pediatric practice were more than four times as likely as respondents with primary adult or geriatric practices to indicate that they never mentioned age or grade equivalents in their reports, OR = 4.62 (90% confidence interval = 2.53–8.42). In fact, almost a third ($n = 17$,

31.48%) of the pediatric specialists in this sample completely eschewed age or grade equivalents, whereas very few of them ($n = 2$, 3.70%) always provided such information.

It may seem ironic that neuropsychologists working with children are the least likely to use age or grade equivalents. However, this trend is consistent with a longstanding body of research in the developmental literature that has identified significant psychometric problems with such scores, including (but not limited to) the lack of equal distances between measurement points and the gross exaggeration of small performance differences (Berk, 1981; Burns, 1982; Hishinuma & Tadaki, 1997; Lawrence, 1992). It is possible that pediatric neuropsychologists are simply more aware of that developmental psychometric literature than their colleagues who work primarily with adult or geriatric patients.

Narrative organization

Participants were asked about the way they organized their reports according to specific themes, domains, or sections. These data are presented in Table 2. Inspection of this table suggests that the vast majority of neuropsychologists routinely or always divided their reports into separate sections, based on either the component of the assessment process and/or the neurobehavioral domain being described. Descriptions of tests in terms understandable to the lay public, as well as speculation about the nature and location of the cerebral lesion, were used relatively less frequently although still commonly. The greatest degree of variability

Table 2. Percentages of Specific Formats of Neuropsychological Reports.

| Survey item | N | O | R | A |
|--|-------|-------|-------|-------|
| Discussion of <i>every</i> test administered | 14.25 | 24.88 | 35.99 | 24.88 |
| Separation into distinct sections (e.g., history, observations, test results) | .24 | 1.45 | 20.77 | 77.54 |
| Narrative description in lay persons' terms of the type of task involved on specific tests | 4.83 | 35.27 | 44.69 | 15.22 |
| Standard grouping of findings by domain (e.g., language, perception, memory) | 2.42 | 8.70 | 34.54 | 54.35 |
| Hypothesis about lesion nature/location | 1.93 | 42.27 | 41.06 | 14.73 |

Note. N = never; O = occasionally; R = routinely; A = always.

regarding report organization pertained to whether participants discussed every single test that was included in the evaluation of the patient.

More than 14% of the sample indicated that they never commented on every test that was administered, whereas almost a quarter of the sample reported that they always did so. Employment setting, patient age, diagnostic category, reimbursement structure, board certification, and involvement with supervision did not affect these distributions ($p > .01$ on all variables). Thus, there were no clearly meaningful relationships between practice parameters and this aspect of report organization. The only thing that emerged from post-hoc analyses was that the average report length of the participants who always discussed every single test administered ($M = 9.61$, $SD = 6.61$) was considerably longer than that of the rest of the sample ($M = 6.65$, $SD = 3.50$). This difference was statistically significant, $F(1, 412) = 30.73$, $p < .0001$. The effect size ($\eta^2 = .07$) was modest by conventional standards (Murphy & Myors, 1998), which may be due to the large variance in report length in both groups. These findings suggest that, although there may be very good reasons to discuss every single test in specific instances, practitioners need to be aware of the fact that this may lengthen reports considerably. Making longer reports does not necessarily add to clarity or clinical utility, and it is therefore important to focus on how well the report answers the referral question and/or offers new insights (Donders, 1999; Williams & Boll, 2000).

Referral Question

Information about the way participants answered the referral question in their reports is presented in Table 3. It appears that most neuropsychologists

used a similar format for answering the referral question because there were no clear polar discrepancies in the distributions of responses to any of the items in this table. The vast majority ($> 95\%$) of the sample felt most comfortable with consolidating this information routinely or always in a specifically designated section of the report, although substantial minorities occasionally used a different communication format. The ‘other’ category was used so infrequently ($< 2\%$) by participants that it was not analyzed further.

Diagnostic Codes

Provision of formal diagnostic codes is often important for billing and reimbursement purposes. However, that does not mean that such codes are necessarily included in documentation that goes to the referring agent because, reporting and billing are often two separate processes, as many respondents indicated in the ‘comments’ section of the survey. For this survey, participants were specifically asked which types of codes they included in their reports. These data are presented in Table 4. ICD-9-CM codes were not included frequently by the clear majority ($> 75\%$) of the sample, and the ‘other’ category was used too infrequently ($< 2\%$) to allow meaningful analysis. However, there was considerable variability with regard to the utilization of DSM-IV diagnostic codes.

More than 10% of the participants indicated that they never included DSM-IV codes in their reports while at the same time more than 18% indicated that they always did so. Of all the variables evaluated, there were two that had a statistically significant relationship with this pattern. First of all, primary employment setting affected the distribution of ‘always’ responses, $\chi^2(2, N = 394) = 15.19$, $p < .001$. These data are

Table 3. Percentages of Specific Ways of Answering Referral Questions in Neuropsychological Reports.

| Survey item | N | O | R | A |
|---|-------|-------|-------|-------|
| Separate cover letter or chart note | 36.71 | 54.11 | 6.28 | 2.90 |
| Summary/conclusion section of report | .00 | 1.69 | 24.64 | 73.67 |
| Woven into the general text of the report | 23.19 | 42.03 | 26.09 | 8.70 |
| Other (specify) | 98.55 | .97 | .48 | .00 |

Note. N = never; O = occasionally; R = routinely; A = always.

Table 4. Percentages of Inclusion of Formal Diagnostic Codes in Neuropsychological Reports.

| Survey item | N | O | R | A |
|-----------------|-------|-------|-------|-------|
| DSM-IV | 10.63 | 43.00 | 28.26 | 18.12 |
| ICD-9-CM | 33.82 | 42.27 | 14.49 | 9.42 |
| Other (specify) | 98.79 | .72 | .48 | .00 |

Note. N = never; O = occasionally; R = routinely; A = always.

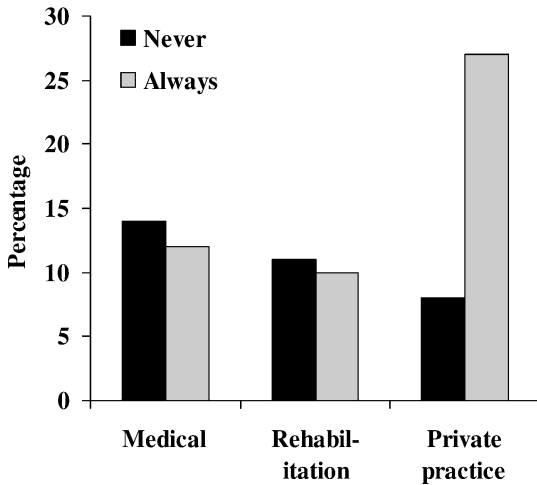


Fig. 3. Frequency of inclusion of DSM-IV diagnostic codes in neuropsychological reports, by primary practice setting.

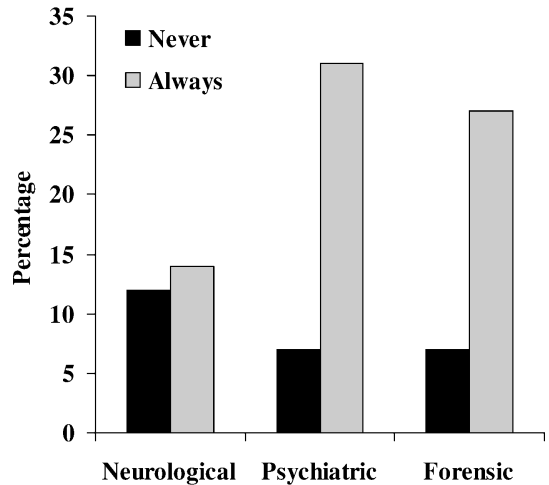


Fig. 4. Frequency of inclusion of DSM-IV diagnostic codes in neuropsychological reports, by primary diagnostic group served.

presented in Figure 3. Private practitioners were more likely to always include this information in their reports than were those neuropsychologists employed in medical or rehabilitation settings, $OR = 2.82$ (90% confidence interval = 1.79–4.43). There was also a statistically significant main effect of diagnostic group on the distribution of 'always' responses to this survey item, $\chi^2(2, N = 333) = 10.02, p < .01$. These data are presented in Figure 4. Neuropsychologists who saw primarily neurological patients were less likely to include DSM-IV codes in their reports than those dealing primarily with psychiatric or forensic patients, $OR = 2.50$ (90% confidence interval = 1.53–4.07). It must be emphasized that these were relative differences, and that there was considerable overlap between the groups (resulting in the fairly small OR values). However, the trend of these findings makes sense from a

practical point of view. Private practitioners may include formal diagnostic codes more often than neuropsychologists employed in institutional settings because the former group tends to be much more actively involved in dealing with third-party reimbursement activities. At the same time, since DSM-IV codes are psychiatric in nature, they tend to get used less by practitioners whose practice is primarily neurological in nature.

Recommendations

There are various ways in which recommendations can be offered in neuropsychological reports. Table 5 presents data about the characteristics of the current sample in this regard. Inspection of this table suggests that presentation of suggestions for intervention or follow-up were most often presented in a separate section, although a substantial minority occasionally

Table 5. Percentages of Formats for Offering Recommendations in Neuropsychological Reports.

| Survey item | N | O | R | A |
|---|-------|-------|-------|-------|
| Itemized in a separate section | 7.00 | 30.43 | 27.29 | 35.27 |
| Narrative description in a separate section | 12.56 | 28.50 | 35.75 | 23.19 |
| Woven into the general text of the report | 47.58 | 41.55 | 8.70 | 2.17 |
| Other (specify) | 98.55 | .72 | .72 | .00 |

Note. N = never; O = occasionally; R = routinely; A = always.

included them in the general text of the report. This is consistent with the above-described results regarding how participants answered the referral question. The ‘other’ category was again not utilized frequently enough (< 2%) to allow for specific analyses. However, there appeared to be considerable divergence with regard to the use of a narrative description for offering recommendations.

Almost 13% of the sample never offered recommendations in a narrative (as opposed to itemized) format, whereas slightly more than 23% always used that format. There was only one variable that met the a priori established level of statistical significance. Diagnostic category had a statistically significant effect on the distribution of ‘always’ responses, $\chi^2(2, N = 333) = 11.53$, $p < .01$. These data are presented in Figure 5.

Participants who primarily saw psychiatric patients were far less likely to use the narrative format as their method of choice than clinicians working predominantly with neurological or forensic patients, $OR = 7.78$ (90% confidence interval = 2.32–26.09). Considered in concert with the above-mentioned findings regarding utilization of DSM-IV codes, it is possible that neuropsychologists who specialize in psychopathology tend to be more focused on itemized diagnostic classification and the associated specific recommended treatment than other practitioners. In contrast, practitioners who see primarily neurological or forensic patients may provide more descriptive narratives about possible interventions with known, suspected, or disputed brain-behavior relationships.

Report Distribution

Participants were also asked about their most typical procedures regarding distribution of neuropsychological reports. These data are presented in Table 6. Slightly more than half of the sample indicated that they never made meaningful changes to the content of the report, depending on who was on the distribution list, and the vast majority of the remaining participants indicated that they would do so only occasionally. Thus, most neuropsychologists appear to want to maintain the integrity of the complete report under the vast majority of circumstances. Giving the patient or family a copy of the report also appeared to happen on an occasional basis for the majority of the sample. However, there was considerable variability in the practice of reviewing the findings and recommendations first with the patient or family before distributing the report.

Almost 15% of the sample indicated that they would never wait to review the report with the

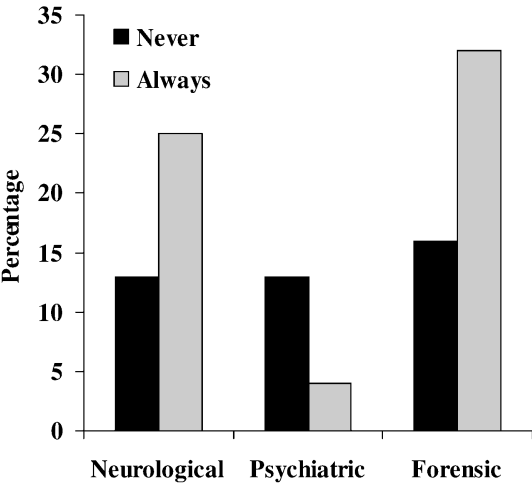


Fig. 5. Frequency of utilization of a narrative format for offering recommendations in neuropsychological reports, by primary diagnostic group served.

Table 6. Percentages of Procedures for Distributing Neuropsychological Reports.

| Survey item | N | O | R | A |
|--|-------|-------|-------|-------|
| Wait until after review with the patient/family | 14.73 | 36.71 | 36.71 | 11.84 |
| Modify or delete sections of the reports, depending on where it is to be sent | 52.90 | 44.44 | 2.66 | .00 |
| Give the patient/family a copy of the report | 6.76 | 61.84 | 22.71 | 8.70 |

Note. N = never; O = occasionally; R = routinely; A = always.

patient or family before sending it out, whereas this was the standard procedure for almost 12% of the participants. The only variable that had a statistically significant association with this practice was that of age of the patient, $\chi^2(2, N = 348) = 24.39, p < .0001$. These data are presented in Figure 6. Neuropsychologists whose clientele was predominantly pediatric in nature were much more likely to always defer distribution of the report until after review with the patient or family than were clinicians working primarily with adult or geriatric patients, $OR = 5.25$ (90% confidence interval = 2.89–9.55). Given the fact that parents are typically the most permanent influences on the daily lives of children, it is understandable that many pediatric neuropsychologists want to prepare and inform them as much as possible in a timely

manner. Such an interpretive session may serve not only to enable them to become active advocates for their child, but also to allow them to participate in the formulation of the final intervention plan (Baron, 2000).

Report Length

Having addressed various aspects of content and format of reports, a final question for participants concerned how long their document ended up being. In the complete sample, the median length of clinical neuropsychological reports was six pages ($M = 7.38, SD = 4.65$). The range was considerable; on the one extreme three respondents preparing a one-page document, and on the other end of the spectrum, four respondents averaging 30 or more pages. Because of this degree of variability, it was decided to evaluate if report length varied systematically with any practice variables. These data are presented in Table 7. For the associated statistical analyses, only comparisons that yielded effect sizes that met the a priori established minimum criteria ($p < .01$ and $\eta^2 > .05$) will be interpreted.

There was a statistically significant effect of employment setting, $F(2, 392) = 31.82, p < .0001$. The only post hoc comparison that yielded an effect size that met the a priori established minimum criterion was concerned that between neuropsychologists in private practice and those in medical settings. The former group wrote considerably longer reports than the latter one, $F(1, 329) = 54.84, p < .0001$, and the effect size in this regard was medium, $\eta^2 = .14$.

The effect of patient age group was also statistically significant, $F(2, 345) = 9.69, p < .0001$. Clinicians with a predominantly geriatric practice wrote much more succinct reports than their coun-

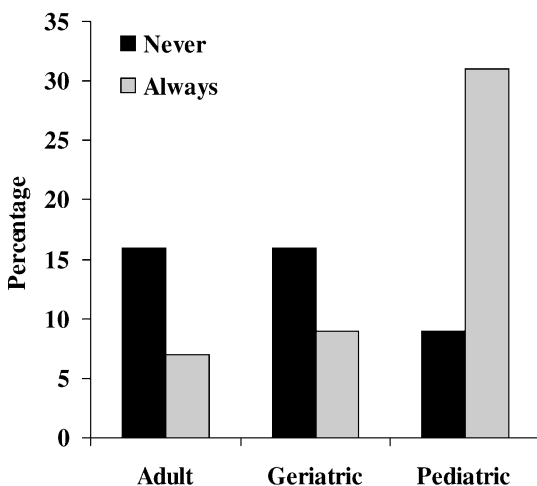


Fig. 6. Frequency of deferring distribution of neuropsychological reports until after review with the patient or family, by primary age group served.

Table 7. Length of Neuropsychological Reports (in Pages) by Specific Practice Parameters.

| Variable | <i>M</i> | (<i>SD</i>) | Median | Range |
|--------------------------------------|----------|---------------|--------|-------|
| Employment setting | | | | |
| Medical | 5.37 | (2.92) | 5.00 | 1–16 |
| Rehabilitation | 6.49 | (2.97) | 6.00 | 1–14 |
| Private practice | 9.13 | (5.41) | 8.00 | 2–35 |
| Primary patient age group (> 50%) | | | | |
| Adult | 8.31 | (5.11) | 7.00 | 2–35 |
| Geriatric | 5.49 | (2.89) | 5.00 | 1–15 |
| Pediatric | 7.67 | (3.84) | 7.00 | 2–16 |
| Primary diagnostic category (> 50%) | | | | |
| Neurological | 6.36 | (3.73) | 6.00 | 1–30 |
| Psychiatric | 7.22 | (3.69) | 7.50 | 2–20 |
| Forensic | 11.77 | (7.19) | 10.00 | 4–35 |
| Primary reimbursement source (> 50%) | | | | |
| Medicaid/Medicare | 5.97 | (3.01) | 6.00 | 1–15 |
| Commercial insurance | 6.55 | (4.09) | 5.00 | 1–30 |
| Medicolegal | 11.86 | (7.31) | 10.00 | 4–35 |

terparts in pediatrics, $F(1, 129) = 13.84, p < .001$, as well as those in a primarily adult practice, $F(1, 291) = 18.14, p < .0001$. The former difference was associated with a medium effect size, $\eta^2 = .10$, but the latter one was fairly small, $\eta^2 = .06$.

Diagnostic category also had a statistically significant effect on report length, $F(2, 330) = 29.03, p < .0001$. Neuropsychologists with a majority forensic practice generated reports that were much more lengthy than clinicians seeing primarily neurological patients, $F(1, 285) = 55.61, p < .0001$, or clinicians with a primarily psychiatric practice, $F(1, 88) = 14.48, p < .001$. Both of these differences were associated with medium effect sizes of, $\eta^2 = .16$ and $\eta^2 = .14$, respectively.

There were also statistically significant differences in the number of pages in the average neuropsychological report, depending on where the majority of financial coverage for services came from, $F(2, 257) = 31.88, p < .0001$. Neuropsychologists who received more than 50% of their reimbursement through independent medicolegal evaluations wrote considerably longer reports than those practitioners who were primarily dependent on either Medicaid/Medicare, $F(1, 144) = 45.45, p < .0001$, or commercial insurance, $F(1, 171) = 37.63, p < .0001$. Again, effect sizes were medium at $\eta^2 = .24$ and $\eta^2 = .18$, respectively.

The congruence of these findings is clear: Individuals who are in private practice, who see primarily non-geriatric, forensic patients, and who typically get paid by lawyers or insurance case managers write much longer reports than anybody else. Williams and Boll (2000) have reviewed several reasons why this may occur. First of all, because of the often adversarial context in which many of these evaluations take place, neuropsychologists may be more elaborate in order to fend off anticipated challenges to their conclusions. A second reason may be that there is often a question about a pre-existing or comorbid condition, which tends to lead to more detailed discussion of historical information. On the other hand, it has also been suggested that it is important to omit irrelevant details and to avoid duplication of information that is readily available from other sources (Spren & Strauss, 1998, pp. 29–42). Eventually, this requires careful judgment by the report writer, keeping in mind the nature of the referral question, the level of neuropsychological expertise of the primary target audience, and the potential of the report being read by persons other than the referring agent (Axelrod, 2000). Such judgment may be particularly relevant when there are financial incentives to write longer reports, since most independent medicolegal evaluations tend to get billed by the hour, at a rate that is substantially higher than that for

regular clinical services (Putnam, Deluca, & Anderson 1994).

CONCLUSIONS

The purpose of this survey investigation was to determine how variations in the content and organization of clinical neuropsychological reports are related to specific practice parameters. In the first presentation of a two-part series about this project (Donders, *in press*), patient age group, diagnostic category, and reimbursement structure were found to be of most prominent influence on various content areas of such reports. The current results expand those findings. Consistent with the previously presented data regarding content, the current results concerning report organization showed many similarities between the writing habits of a wide range of neuropsychologists. At the same time, specific characteristics of the clinical practice circumstances had relevance with regard to issues such as the inclusion of specific test scores and diagnostic codes, how recommendations were offered, when the report was distributed, and how long the document typically was.

Patient age group (particularly specialization in pediatrics) had a strong influence on the style of reports. Pediatric neuropsychologists tended to be the least likely to use age- or grade-equivalent scores. Considered in concert with the previously reported finding that such neuropsychologists were most likely to specify which norms they used to analyze the data (Donders, 2001), this suggests that they tend to be more explicit about psychometric issues than their colleagues who work primarily with adult or geriatric patients. Part of the reason for this phenomenon may be that pediatric neuropsychologists often need to present their findings in a context that is relevant and convincing to school professionals. For example, most states still employ a discrepancy formula for the determination of eligibility for special education services under the learning disability qualification, despite accumulating research that has questioned seriously the validity of this practice (Aaron, 1997; Fletcher et al., 1998; Vellutino, Scanlon, & Reid, 2000). Provi-

sion of more specific psychometric and normative information may be important to support positions that may be met with some reluctance on the part of school professionals who are obliged to take into account such formulas.

Pediatric neuropsychologists were also the most likely to wait with distribution of the report until after review with the patient or family. They appear to give great importance for the interpretive session with the parents. In light of the fact that parents are the most likely advocates for their children, this offers an opportunity for empowerment (Baron, 2000). It must be realized that this does not mean that neuropsychologists working with adult or geriatric patients neglect such opportunities. They just tend to have a proportionally much greater involvement with medicolegal cases where the patient is not the client, and where interpretive sessions may be inappropriate because of the role of the clinician as an independent expert.

Diagnostic category was another practice parameter that was of prominent influence on various aspects of report writing. Practitioners who saw primarily neurological patients were those least likely to include DSM-IV codes in their reports whereas clinicians dealing with a predominantly psychiatric clientele were those least likely to use narrative descriptions to provide recommendations. There may also be other unique aspects of individuals' specific practice that could not be captured in this survey. However, the trend of these findings is consistent with the fact that reports may need to be tailored to the context of the referral and follow-up (Williams & Boll, 2000). Various authors have provided specific recommendations about how reports can be modified for use in specific environments, such as in rehabilitation settings (Conway & Crosson, 2000; Pramuka & McCue, 2000) or with geriatric patients (Koltai & Welsh-Bohmer, 2000).

Individuals in private practice who did the majority of their evaluations on forensic patients for medicolegal services also appeared to be a distinct group in terms of report appearance because they wrote longer reports than anybody else. Most likely, this is a result of the need to review confounding historical issues and to

document the basis for conclusions comprehensively in a likely adversarial context. This finding is consistent with the previously reported impression that forensic assessment requires specific attention to issues such as documentation of results, maintenance of records, and other relevant aspects of neuropsychological practice (Binder & Thompson, 1995). Some of the controversies in this growing field have been addressed in recent position papers addressing matters ranging from the presence of third-party observers during evaluations to the handling of requests for raw data (NAN Policy and Planning Committee, 2000a, b). Several authors have also cautioned the need to be aware of sources of bias during neuropsychological evaluations in a medicolegal context (Sweet & Moulthrop, 1999; Van Gorp & McMullen, 1997).

Consistent with the findings regarding report content (Donders, in press), the current results suggest that neuropsychologists who supervise the work of predoctoral interns or postdoctoral residents generate reports that are very similar in style to the documents of practitioners who are not engaged in such supervisory activities. Thus, there appears to be continuity in the field that is consistent with the spirit of recently developed guidelines for the preparation of aspiring neuropsychologists for future independent practice (Hannay et al., 1998; Johnstone & Farmer, 1997). Another consistent finding is that clinicians who are board-certified (ABPP) generally write reports that are largely similar in terms of how and what information is presented than other neuropsychologists, even though the former group includes a somewhat greater minority with strong views on issues such as inclusion of specific test and normative data. A recent independent survey has also suggested that, although board certification is associated with characteristics such as greater involvement in forensic assessment and supervision of persons in training, there is strong consensus between neuropsychologists with and without ABPP status regarding assessment philosophy and the types of information gathered during evaluation (Sweet, Moberg, & Suchy, 2000).

The overall results from this survey suggest that there is agreement within the field of

neuropsychology with regard to many aspects of the content and format of reports. At the same time, the current findings indicate that there is no such thing as a 'one size fits all' or cookbook solution to report preparation that will meet all practice needs. Individual neuropsychologists should tailor their reports to the needs of their clients and the most likely target audience. It is hoped that the current descriptive data may provide useful base rate information to facilitate this process, particularly in the process of training of interns and residents.

REFERENCES

- Aaron, P.G. (1997). The impending demise of the discrepancy formula. *Review of Educational Research*, 67, 461–502.
- Axelrod, B.N. (2000). Neuropsychological report writing. In R.D. Vanderploeg (Ed.), *Clinician's guide to neuropsychological assessment*, 2nd ed. (pp. 245–273). Mahwah, NJ: Lawrence Erlbaum.
- Baron, I.S. (2000). Clinical implications and practical applications of child neuropsychological evaluations. In K.O. Yeates, M.D. Ris, & H.G. Taylor (Eds.), *Pediatric neuropsychology: Research, theory, and practice* (pp. 439–456). New York, NY: Guilford.
- Berk, R.A. (1981). What's wrong with using grade-equivalent scores to identify LD children? *Academic Therapy*, 17, 133–140.
- Binder, L.M., & Thompson, L.L. (1995). The ethics code and neuropsychological assessment practices. *Archives of Clinical Neuropsychology*, 10, 27–46.
- Burns, E. (1982). The use and interpretation of standardized grade equivalents. *Journal of Learning Disabilities*, 15, 17–18.
- Cicchetti, D.V. (1998). Role of null hypothesis significance testing (NHST) in the design of neuropsychological research. *Journal of Clinical and Experimental Neuropsychology*, 20, 293–295.
- Conway, T., & Crosson, B. (2000). Neuropsychological assessment. In R.G. Frank & T.R. Elliott (Eds.), *Handbook of rehabilitation psychology* (pp. 327–343). Washington, DC: American Psychological Association.
- Donders, J. (1999). Pediatric neuropsychological reports: Do they really have to be so long? *Child Neuropsychology*, 5, 70–78.
- Donders, J. (2001). A survey of report writing by neuropsychologists, I: General characteristics and content. *The Clinical Neuropsychologist*, 15, 137–149.
- Fletcher, J.M., Francis, D.J., Shaywitz, S.E., Lyon, G.R., Floorman, B.R., Stuebing, K.K., & Shaywitz,

- B.A. (1998). Intelligent testing and the discrepancy model for children with learning disabilities. *Learning Disabilities Research and Practice, 13*, 186–203.
- Freides, D. (1993). Proposed standard of professional practice: Neuropsychological reports display all quantitative data. *The Clinical Neuropsychologist, 7*, 234–235.
- Hannay, H.J., Bieliauskas, L.A., Crosson, B.A., Hammeke, T.A., Hamsher, K. deS., & Koffler, S.P. (1998). Proceedings: The Houston conference on specialty education and training in clinical neuropsychology. *Archives of Clinical Neuropsychology, 13*, 157–249.
- Hishinuma, E.S., & Tadaki, S. (1997). The problem with grade and age equivalents: WIAT as a case in point. *Journal of Psychoeducational Assessment, 15*, 214–225.
- Johnstone, B., & Farmer, J.E. (1997). Preparing neuropsychologists for the future: The need for additional training guidelines. *Archives of Clinical Neuropsychology, 12*, 523–530.
- Koltai, D.C., & Welsh-Bohmer, K.A. (2000). Geriatric neuropsychological assessment. In R.D. Vanderploeg (Ed.), *Clinician's guide to neuropsychological assessment*, 2nd ed. (pp. 383–415). Mahwah, NJ: Lawrence Erlbaum.
- Lawrence, C.W. (1992). Assessing the use of age-equivalent scores in clinical management. *Language, Speech and Hearing Services in the Schools, 23*, 6–8.
- Lees-Haley, P.R., & Courtney, J.C. (2000). Disclosure of tests and raw test data to the courts: A need for reform. *Neuropsychology Review, 10*, 169–174.
- Matarazzo, R.G. (1995). Psychological report standards in neuropsychology. *The Clinical Neuropsychologist, 9*, 249–250.
- Murphy, K.R., & Myers, B. (1998). *Statistical power analysis: A simple and general model for traditional and modern hypothesis tests*. Mahwah, NJ: Lawrence Erlbaum.
- NAN Policy and Planning Committee (2000a). Presence of third party observers during neuropsychological testing: Official statement of the National Academy of Neuropsychology. *Archives of Clinical Neuropsychology, 15*, 379–380.
- NAN Policy and Planning Committee (2000b). Test security: Official position statement of the National Academy of Neuropsychology. *Archives of Clinical Neuropsychology, 15*, 383–386.
- Naugle, R.I., & McSweeney, A.J. (1995). On the practice of routinely appending neuropsychological data to reports. *The Clinical Neuropsychologist, 9*, 245–247.
- Naugle, R.I., & McSweeney, A.J. (1996). More thoughts on the practice of routinely appending raw data to reports. *The Clinical Neuropsychologist, 10*, 313–314.
- Pope, K.S., Butcher, J.N., & Seelen, J. (1993). *The MMPI, MMPI-2, and MMPI-A in court: A practical guide for expert witnesses and attorneys*. Washington, DC: American Psychological Association.
- Pramuka, M., & McCue, M. (2000). Assessment to rehabilitation: Communicating across the gulf. In R.D. Vanderploeg (Ed.), *Clinician's guide to neuropsychological assessment*, 2nd ed. (pp. 337–355). Mahwah, NJ: Lawrence Erlbaum.
- Putnam, S.H., DeLuca, J.W., & Anderson, C. (1994). The second TCN salary survey: A survey of neuropsychologists: II. *The Clinical Neuropsychologist, 8*, 245–282.
- Reitan, R.M., & Wolfson, D. (1992). *Neuropsychological evaluation of older children*. South Tucson, AZ: Neuropsychology Press.
- Reitan, R.M., & Wolfson, D. (1993). *The Halstead-Reitan neuropsychological test battery: Theory and clinical application*, 2nd ed. South Tucson, AZ: Neuropsychology Press.
- Spreen, O., & Strauss, E. (1998). *A compendium of neuropsychological tests*, 2nd ed. New York, NY: Oxford.
- Stevens, J. (1992). *Applied multivariate statistics for the social sciences*, 2nd ed. Hillsdale, NJ: Lawrence Erlbaum.
- Sweet, J.J., Moberg, P.J., & Suchy, Y. (2000). Ten-year follow-up survey of clinical neuropsychologists: Part I. Practices and beliefs. *The Clinical Neuropsychologist, 14*, 18–37.
- Sweet, J.J., & Moulthrop, M.A. (1999). Self-examination questions as a means of identifying bias in adversarial assessments. *Journal of Forensic Neuropsychology, 1*, 73–88.
- Thompson, B. (2000). Canonical correlation analysis. In L.G. Grimm & P.R. Yarnold (Eds.), *Reading and understanding more multivariate statistics* (pp. 285–316). Washington, DC: American Psychological Association.
- Van Gorp, W.G., & McMullen, W.J. (1997). Potential sources of bias in forensic neuropsychological evaluations. *The Clinical Neuropsychologist, 11*, 180–187.
- Vellutino, F.R., Scanlon, D.M., & Lyon, G.R. (2000). Differentiating between difficult-to-remediate and readily remediated poor readers: More evidence against the IQ-achievement discrepancy definition of reading disability. *Journal of Learning Disabilities, 33*, 223–238.
- Williams, M.A., & Boll, T.J. (2000). Report writing in clinical neuropsychology. In G. Groth-Marnat (Ed.), *Neuropsychological assessment in clinical practice* (pp. 575–602). New York, NY: Wiley.