

Honours Research Project Proposal 2023

Name of Student: Aisyah Amila Husna

Title of Project: Neuropsychological Test Use Among Australian Neuropsychologists

Supervisors: Michael Takagi, Jessica Trevena-Peters, Adam McKay, Chloe Anderson

Word Count (Excluding reference list): 1629

Background (50%)

Clinical neuropsychology is a specialty field within psychology that focuses on understanding brain-behaviour relationships, particularly in those with brain disorders (Adams, 2002; Boake, 2008). Neuropsychologists are equipped with an in-depth understanding of this relationship and how it manifests in daily functioning. Their role entails engaging in both assessment and intervention. Overall, assessment subsumes a large part of their work; clinicians report spending an average of 59.2% of their time with clients conducting assessments (Rabin et al., 2016). Selecting appropriate assessment tools is critical, as test results are a key consideration for neuropsychologists to develop clinical case formulations and answer referral questions from multidisciplinary sources (Boake, 2008). This may include forming diagnostic, treatment or rehabilitation recommendations that would significantly impact the client's treatment progress. Tests are rarely used individually and instead used in a predetermined combination (full test battery) or selected based on the referral question (hypothesis-driven approach; Kane, 1991). A multitude of neuropsychological tests have been developed, normed and psychometrically evaluated for clinical use within the field. Each test assesses specific functions within a domain of

cognition, emotional or behavioural functioning, often in a specific clinical group (Rabin et al., 2016). Additionally, great diversity in referral sources and questions, educational background, client groups, and work settings exist within the neuropsychological field (Rabin et al., 2016). Therefore, clinical judgement is needed to determine which tests best suit referral and client's needs.

Since the 1990s, to document diversity and identify issues in the neuropsychological field, attempts to characterise and understand the use of neuropsychological tests have been made (Butler et al., 1991; Egeland et al., 2016; Rabin et al., 2016). Previous studies consisting of surveys completed by neuropsychologists have revealed that the Wechsler Memory Scale (WMS) and Wechsler's Adult Intelligence Scale (WAIS) are by far, and over time, the most frequently used tests (Butler et al., 1991; Rabin et al., 2005; Rabin et al., 2016). While there are minor differences between countries, a majority of the most commonly used tests were developed decades ago, suggesting that the field of neuropsychology overall is slow to incorporate recent research discoveries (Marcopulos & Łojek, 2019). Moreover, studies exploring changes in the field found that the types of tests selected remained relatively stable within the last three decades (Egeland et al., 2016; Rabin et al., 2016). Despite this, there is an overall trend of moving away from administering full test batteries and rather utilising hypothesis-driven approaches (Butler et al., 1991; Retzlaff et al., 1992). Interestingly, recently developed tests and batteries that clinicians have readily adopted tend to extend paradigms that underlie traditionally used tests (Egeland et al., 2016). For instance, updated iterations of older tests (e.g. WAIS-5) or including older tests into newer batteries (e.g. Stroop test in the Delis-Kaplan Executive Function System (D-KEFS) battery) were found to be integrated into current practices. The reason behind these trends is still unclear; however, different theoretical orientations have been shown to be linked with specific test selection preferences (Retzlaff et al., 1992). For example, Halstead-Reitan

clinicians tend to use tests from the Halstead-Reitan battery, while eclectic clinicians frequently use WAIS-R. Moreover, although existing studies have focused on identifying test use patterns and have yet to investigate test selection rationale, Rabin et al. (2016) suggested that neuropsychologists are more likely to select tests covered in their training and those frequently mentioned in textbooks and journal articles. Furthermore, the advancement of technology has been slow to be incorporated into neuropsychological testing. The rate of computer use for testing is low and predominantly limited to use within the scoring process (Egeland et al., 2016). Overall, survey results from previous studies have indicated that test usage patterns are generally stable, but the underlying reasons have not been investigated (Egeland et al., 2016; Marcopulos & Łojek, 2019; Rabin et al., 2016).

To date, only one study has examined test use amongst Australian neuropsychologists (Sullivan & Bowden, 1997). Similar to survey results from other countries, WAIS, WMS and WMS-R were among Australia's most frequently used tests. However, several differences were also identified; popular tests in other countries, such as Bender-Gestalt, Minnesota Multiphasic Personality Inventory (MMPI) and the full Halstead-Reitan Neuropsychological Test Battery (HRB), were less popular. Moreover, Rey's Complex Figure Test, F-A-S test, Austin Maze, Goldstein-Scheerer Colour Form Sorting Test, Rey Auditory Verbal Learning Test (RAVLT), and New Adult Reading Test were frequently used in the Australian population despite not having the same popularity elsewhere. These differences may be due to the Australian neuropsychologist's less involved role in assessing personality, psychopathology and motor skills (Sullivan & Bowden, 1997). Since then, no other studies have investigated this topic. Thus, the current trends of neuropsychological test usage in Australia are not well understood.

While Sullivan & Bowden's (1997) findings provided valuable information regarding the assessment field of neuropsychology in Australia, the study has several limitations.

Firstly, the survey was conducted 26 years ago, which largely limits the extent to which the findings can be applied to modern practices. Since then, the field of neuropsychology has undergone immense growth concerning advances in neuropsychological discoveries, use of technology and the number of practising neuropsychologists (Australian Health Practitioner Regulation Agency, 2022; Howieson, 2019; Parsons & Duffield, 2019). Secondly, the survey results provide a glimpse into the overall frequency of test use regardless of area of practice, cognitive domain, client population, or rationale for selection. As demonstrated by previous studies, understanding test usage by such factors will provide a richer insight into test selection patterns and rationale (Camara et al., 2000; Rabin et al., 2016). Finally, similar to previous studies, Sullivan & Bowden (1997) explored paediatric and adult test use together, despite different tests being available for these populations. Neuropsychological tests designed for adults are not always suitable for use within paediatric populations, largely due to the developing nature of a child's cognition (Vicki et al., 2018). Therefore, the current literature has not adequately investigated test usage of clinicians who work with paediatric populations. As such, by developing a comprehensive survey to be distributed among Australian neuropsychologists, this study will characterise the field of neuropsychology in greater detail by classifying test use based on cognitive domains and client populations. Moreover, understanding the rationale behind test selection will help shed light on the reason behind the current patterns in the field.

Aims and Hypotheses (20%)

This study will aim to characterise and define test usage patterns amongst neuropsychologists in Australia. Due to the exploratory nature of this study, no hypothesis will be tested and instead we will seek to answer the following research questions:

1. Which neuropsychological tests are most frequently used by Australian neuropsychologists for adult clients, including within each cognitive domain?

2. Which neuropsychological tests are most frequently used by Australian neuropsychologists for paediatric clients, including within each cognitive domain?
3. What factors guide clinician test selection?

Proposed Methodology and Data Analysis (20%)

Design

This study will utilise a descriptive research design. The research team will develop a survey consisting of open-ended (e.g., free text response) and closed-ended (e.g., multiple choice) questions that will be divided into three main sections: demographics, test usage and test selection rationale. Demographics will include clinician and practice details, such as age, gender, neuropsychology training, years of practice, work setting, client age (paediatric or adult), two major areas of practice (e.g., adult neurodegenerative, paediatric rehabilitation etc.), and common reasons for referral. For each area of practice selected, a list of neuropsychological tests will be provided by cognitive domain (e.g., memory, executive functioning, validity testing) as guided by the literature, with inclusion of both paediatric and adult tests. Participants will be asked to select the tests that they commonly use and will have the option to add additional tests. The final section will contain short-answer questions about the reasons behind test selection. The survey will be completed using REDCap.

Participants and Procedure

All neuropsychologists currently practising in Australia ($n = 853$; APHRA, 2022) will be eligible to participate in the study. Mirroring Sullivan & Bowden's (1997) sample size, our study will aim to collect 113 responses. An email invitation to participate in the study will be posted to the NPInOz Google group (email distribution list of neuropsychologists working in Australia), along with an explanatory statement and link to the survey. Survey participation will be voluntary and anonymous. The survey will be open for approximately 3 months. This

study will seek approval from the Monash University Human Research Ethics Committee (MUHREC).

Data analysis

The survey responses will be exported from REDCap, with quantitative data analysed using R v.4.2.2 and qualitative data using NVivo 12. Descriptive analyses will be conducted to describe the demographics and frequency of test usage. Frequency data will also be displayed graphically where appropriate, using bar graphs. Qualitative data will be analysed using content analysis. From free text responses, reasons for test selection will be identified and coded both inductively and deductively based on Rabin et al. (2016) suggestions. Categories will then be created based on similarities between codes, and a frequency count for each category will be presented using bar graphs.

Significance and Innovation (10%)

The current study will provide updated information on the field of neuropsychological assessment in Australia. It will be the first to provide a comprehensive insight into test usage patterns, including within the cognitive domain and client population, and investigate the reasoning behind clinicians' test selection. It will also be the first study to include paediatric tests, expanding the applicability of survey results. The findings of this study will contribute knowledge to inform best practices in neuropsychological assessment, which can be applied in clinical (e.g., guiding test selection choices for specific clinical groups) and educational settings (e.g., providing training for a wider variety of tests). Furthermore, the test selection rationale findings can guide further explorations on this topic, such as identifying challenges that deter clinicians from using specific tests. Additionally, the overall findings can be used as a baseline to measure future changes and advances in neuropsychological assessment.

References

- Adams, K. M. (2002). The Houston Conference: the road more traveled. *Neuropsychol Rev*, 12(3), 131-133. <https://doi.org/10.1023/A:1020377812655>
- Australian Health Practitioner Regulation Agency. (2022). *Psychology Board of Australia Registrant data*. <https://www.psychologyboard.gov.au/About/Statistics.aspx>
- Boake, C. (2008). Clinical Neuropsychology. *Professional psychology, research and practice*, 39(2), 234-239. <https://doi.org/10.1037/0735-7028.39.2.234>
- Butler, M., Retzlaff, P. D., & Vanderploeg, R. (1991). Neuropsychological test usage. *Professional Psychology: Research and Practice*, 22, 510-512. <https://doi.org/10.1037/0735-7028.22.6.510>
- Camara, W. J., Nathan, J. S., & Puente, A. E. (2000). Psychological test usage: Implications in professional psychology. *Professional Psychology: Research and Practice*, 31, 141-154. <https://doi.org/10.1037/0735-7028.31.2.141>
- Egeland, J., Løvstad, M., Norup, A., Nybo, T., Persson, B. A., Rivera, D. F., Schanke, A.-K., Sigurdardottir, S., & Arango-Lasprilla, J. C. (2016). Following international trends while subject to past traditions: neuropsychological test use in the Nordic countries. *Clin Neuropsychol*, 30(sup1), 1479-1500. <https://doi.org/10.1080/13854046.2016.1237675>
- Howieson, D. (2019). Current limitations of neuropsychological tests and assessment procedures. *Clin Neuropsychol*, 33(2), 200-208. <https://doi.org/10.1080/13854046.2018.1552762>
- Kane, R. L. (1991). Standardized and flexible batteries in neuropsychology: an assessment update. *Neuropsychol Rev*, 2(4), 281-339. <https://doi.org/10.1007/BF01108849>
- Marcopulos, B., & Łojek, E. (2019). Introduction to the special issue: Are modern neuropsychological assessment methods really "modern"? Reflections on the current

neuropsychological test armamentarium. *Clin Neuropsychol*, 33(2), 187-199.

<https://doi.org/10.1080/13854046.2018.1560502>

Parsons, T. D., & Duffield, T. (2019). National Institutes of Health initiatives for advancing scientific developments in clinical neuropsychology. *Clin Neuropsychol*, 33(2), 246-270. <https://doi.org/10.1080/13854046.2018.1523465>

Rabin, L. A., Barr, W. B., & Burton, L. A. (2005). Assessment practices of clinical neuropsychologists in the United States and Canada: A survey of INS, NAN, and APA Division 40 members. *Arch Clin Neuropsychol*, 20(1), 33-65.
<https://doi.org/10.1016/j.acn.2004.02.005>

Rabin, L. A., Paolillo, E., & Barr, W. B. (2016). Stability in Test-Usage Practices of Clinical Neuropsychologists in the United States and Canada Over a 10-Year Period: A Follow-Up Survey of INS and NAN Members. *Arch Clin Neuropsychol*, 31(3), 206-230. <https://doi.org/10.1093/arclin/acw007>

Retzlaff, P., Butler, M., & Vanderploeg, R. D. (1992). Neuropsychological battery choice and theoretical orientation: a multivariate analysis. *J Clin Psychol*, 48(5), 666-672.
[https://doi.org/10.1002/1097-4679\(199209\)48:5<666::aid-jclp2270480514>3.0.co;2-j](https://doi.org/10.1002/1097-4679(199209)48:5<666::aid-jclp2270480514>3.0.co;2-j)

Sullivan, K., & Bowden, S. C. (1997). Which tests do neuropsychologists use? *Journal of Clinical Psychology*, 53(7), 657-661.
[https://doi.org/https://doi.org/10.1002/\(SICI\)1097-4679\(199711\)53:7<657::AID-JCLP3>3.0.CO;2-F](https://doi.org/https://doi.org/10.1002/(SICI)1097-4679(199711)53:7<657::AID-JCLP3>3.0.CO;2-F)

Vicki, A., Elisabeth, N., & Jacquie, W. (2018). *Developmental Neuropsychology: A Clinical Approach*. Taylor and Francis. <https://doi.org/10.4324/9780203799123>

Ethics and Risk Assessment

Please indicate the answers to the below questions by placing an 'X' in the appropriate column.

	YES	NO	N/A
<i>Is ethical approval required for this project?</i> <i>If yes, please indicate the status of your ethical approval:</i> <ul style="list-style-type: none"><input type="checkbox"/> Approval obtained. Approval reference number:<input type="checkbox"/> Approval pending<input checked="" type="checkbox"/> Approval not yet sought	X		
<i>Have you completed the mandatory Risk Management workshop?</i>		X	
<i>Have you completed a risk assessment for your project in SARAH?</i>		X	