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CHAPTER 1

Michelle M. Braun and Michael W. Parsons

The Expanding Role of Clinical Neuropsychology

The practice and utility of clinical neuropsychology have rapidly expanded since its beginnings in the 1960s, fueled in part by an evolving awareness of its unique contributions to neurocognitive diagnosis and prognosis, recovery of function, treatment, cognitive health, and quality of life for children and adults. An understanding of the key factors that have fueled this expansion provides guidance to position clinical neuropsychology to thrive and flourish in the future, and fuels ideas to integrate new technologies and methods of service delivery into practice.

CORE ATTRIBUTES OF CLINICAL NEUROPSYCHOLOGY AND DIRECTIONS FOR CONTINUED EXPANSION

Three core attributes of clinical neuropsychology—*validity*, *applications*, and *value*—build on one another and have been central to its

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expansion (see Figure 1.1). These core attributes may be strategically emphasized, refined, and creatively expanded through neuropsychology training, practice, and research to fuel its continued growth and relevance in evolving clinical, social, and technological landscapes. We encourage a focus on these three core attributes to enhance the utility of clinical neuropsychology, fuel research on its economic value, and strengthen the long-term relevance of our practice.

Validity

The role of neuropsychological assessment in the care of patients has expanded from simply “finding the lesion” to characterizing patterns of brain–behavior relationships and serving as a tool to enhance diagnostic accuracy and treatment of neuropsychological conditions through traditional and novel applications (Casaletto & Heaton 2017). As compared with other neurodiagnostic tools—including neuroimaging, the neurological examination, computerized cognitive testing, and cognitive screening measures—neuropsychological assessment is the only diagnostic method that provides a direct, standardized measure of neurocognitive functioning with good sensitivity and specificity, as highlighted in Table 1.1.

EXPANDING THE VALIDITY OF CLINICAL NEUROPSYCHOLOGY

The validity and clinical utility of neuropsychological assessment continues to grow as a function of its application to new disease states (see, e.g., Chapter 17 for discussion of neuro-COVID), specific populations (see, e.g., Chapter 2 on culturally and linguistically diverse populations), and technologies (see, e.g., Chapter 8 for discussion of neuropsychology in the context of neuroimaging and electroencephalogram). Growing research into performance validity tests and symptom validity tests has also contributed to increased validity (as detailed in Chapter 4).

Central to the validity of neuropsychological assessment is the role of the neuropsychologist as expert in guiding the assessment process, interpreting findings in the context of other diagnostic data and clinical variables, applying findings to management and treatment decisions, and formulating tailored interventions that incorporate cognitive, psychological, and contextual factors. The validity of assessment depends upon the use of reliable tests and representative normative data, especially with regard to incorporating sociocultural factors into the measurement and interpretation of data in diverse

Figure 1.1. Three core attributes contributing to expansion of neuropsychology.

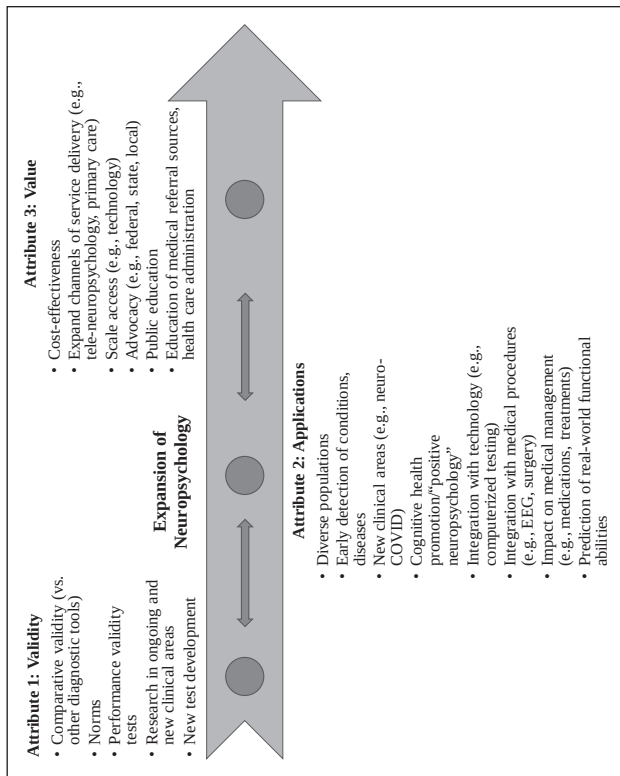


Table 1.1. Neuropsychological Assessment as Compared With Other Diagnostic Tools

	NP testing	CT/MRI	Neuro exam	Computer & Cog Screens
Dx endpoint	Yes	Yes	Yes	Limited
False ±	Less likely	Less likely	Less likely	Likely
Dx utility	High	High	High	Limited
Detects subtle cognitive symptoms	Yes	No	Limited	Limited
Normed/standardized	Yes	Some	N/A	Limited
Directs treatment	Yes	Yes	Yes	Limited

Note. From “The Value of Neuropsychological Evaluation in Medical Practice,” by M. M. Braun, in K. M. Sanders (Ed.), *Physician’s Field Guide to Neuropsychology: Collaboration Through Case Example* (p. 4). Copyright 2019 by Springer Nature (https://doi.org/10.1007/978-1-4939-8722-1_1). Reprinted with permission.

populations (American Academy of Clinical Neuropsychology Relevance 2050 Subcommittee, 2021; Byrd & Rivera-Mindt, 2022). To explore these issues in the context of specific conditions or assessment situations, chapters of this handbook address specific neuropsychological assessment procedures, tests, and norms in diverse populations, identify related limitations, and help contextualize assessment validity. In addition, increasing the diversity of neuropsychologists and trainees is central to driving the creation and validity of new, culturally informed tests and normative data, especially given that the United States population and the patients we serve are projected to become significantly more racially and ethnically diverse in the coming decades.

Given that the older adult population is projected to double by 2050, in tandem with a projected tripling of dementia rates, there is an urgent need for neuropsychologists to develop rapid, reliable, and valid tools for the early detection of cognitive impairment and for neuropsychologists to use their expertise to guide and lead cognitive triage and assessment services in hospitals and organizations.

Applications

Neuropsychological assessment can be flexibly tailored to address multiple clinical issues and variables of interest and provides incremental validity in the diagnosis and prediction of long-term outcomes in patients across the lifespan (Donders, 2020). As detailed in the chapters of this handbook, the roles of neuropsychological assessment and intervention include

1. early detection of neurocognitive conditions;
2. tracking of neurocognitive disease progression and recovery;
3. strategies to minimize the rate of cognitive decline in neurodegenerative disease or chronic neurological diseases that frequently impact cognition (Benedict et al., 2017);
4. characterization of the cognitive impact of medical conditions and systemic diseases and infections (Braun et al., 2011);
5. identification of variables to minimize the risk of cognitive decline related to surgical and medical interventions to treat epilepsy, Parkinson's disease, and cancer, among other medical conditions; and
6. evaluation of variables that impact quality of life, including functional abilities (driving, independent living, and school- and work- related decisions) and decisional capacity (Wood et al., 2020).

EXPANDING THE APPLICATIONS OF NEUROPSYCHOLOGICAL ASSESSMENT AND INTERVENTION

Ongoing research related to new disorders and the utilization of new technologies will be critical to informing future neuropsychological applications, deepening our understanding of brain-behavior relationships, and enhancing service delivery. Since the beginning of the COVID-19 pandemic, teleneuropsychology services have helped to meet consumer needs for safe access to neuropsychological services, especially in rural regions, and there has been increased interest in technological applications of neuropsychological assessment (Diaz-Orueta et al., 2020; Parsons & Duffield, 2020), including computerized testing and teleneuropsychology.

There is also significant potential to expand the practice of clinical neuropsychology using new technologies. For example, NeuroMapper, an intraoperative cognitive mapping tool developed by neuropsychologist Dr. David Sabsevitz, provides rapid, individualized assessment in the operating room and assists in minimizing the resection of functional brain tissue and maximizing neurosurgical

outcomes (Sabsevitz et al., 2020). Novel medical, surgical, and technological approaches for the treatment of neurologic disorders have opened avenues for neuropsychologists to apply their knowledge of brain-behavior relationships, such as in the setting of neuro-modulation for movement disorders and psychiatric conditions. The exploration of other neuropsychology-related technological frontiers has been encouraged through the Disruptive Technology Initiative of the American Academy of Clinical Neuropsychology. In addition, a growing number of app- and technology-based tools have been highlighted at the annual conferences of multiple neuropsychology organizations. The application of various technologies to neuropsychological practice is a rich area for future exploration and innovation, and it may assist in increasing access to our service and reducing wait times for evaluation in the context of a growing demand for services.

Efforts to increase the sensitivity and specificity of neuropsychologically based differential diagnosis in diverse and aging populations will also promote new applications, perhaps through the development of new tests and procedures. Clinical developments such as *positive neuropsychology* interventions have shown promise in using strength-based methods to address the growing societal interest in brain health and reducing the risk of dementia through education and coaching in lifestyle factors; these methods also serve to enhance mood and quality of life (Randolph, 2022). Integrating such approaches into neuropsychology, in tandem with research into the validity and effectiveness of interventions based on these theories, may open new opportunities for neuropsychological assessment and intervention. To highlight core messages and new developments, a Clinical Takeaways section is included in each chapter of this Handbook that offers “clinical pearls” that allow busy clinicians to quickly identify and implement neuropsychological applications.

Value

Neuropsychological assessment is increasingly recognized by the public, referral sources, and payors not only for its reliability but also for its value. There are demonstrated economic benefits to neuropsychological assessment, predominantly related to reducing health care expenditures and service utilization following early identification and treatment of cognitive impairment and dementia (Glen et al., 2020). Demonstrating the value of neuropsychological assessment to stakeholders through federal and state-specific advocacy initiatives, tailored educational materials, and public education has been key in increasing access to neuropsychological services. In particular, the

Interorganizational Practice Committee (IOPC; <https://iopc.online/>)—comprising multiple professional neuropsychology organizations and the American Psychological Association—has successfully advocated for increased access to neuropsychology services under Medicare and through various private insurance carriers. The IOPC continues to actively advocate to improve patient care through increased access to neuropsychology services.

EXPANDING AWARENESS OF THE VALUE OF CLINICAL NEUROPSYCHOLOGY

Continued dissemination of information to medical colleagues, hospital administrators, the public, and consumer groups (e.g., the Alzheimer's Association) regarding the clinical and economic value of neuropsychological assessment will be critical to maintaining referral streams and demand for services. Multiple neuropsychology organizations, including the American Academy of Clinical Neuropsychology, the International Neuropsychological Society, and the National Academy of Neuropsychology, provide high-quality public education on neuropsychology-related topics. In addition, resources for medical specialists, who often serve as primary referral sources, have been specially created to provide an overview of clinical neuropsychological services (Sanders, 2019) and are helpful to disseminate in continued efforts to educate stakeholders on the value of clinical neuropsychology.

Evaluating satisfaction with neuropsychological services is key to understanding perceived value. Survey data show that most physicians who refer to neuropsychologists for diagnostic services were satisfied with the service provided. Ninety percent felt referral questions were satisfactorily answered, and 90% to 94% agreed with diagnostic impressions (Temple et al., 2006). Continuing to assess the perceived value of existing and new services and technologies and make adjustments to enhance value will be key to maximizing utilization by referral sources. For example, adapting report structure and content to maximize utility and efficiency for key stakeholders (Baum et al., 2018) may increase perceived value. Tailoring of neuropsychological services and reports to meet the needs of patients and referral sources is central to increasing value. Expanding integration of neuropsychological services into primary care and specialty clinical services (e.g., oncology, rehabilitation, psychiatry) has increased clinical utility and value, and is poised to continue doing so.

Neuropsychologists are also uniquely qualified to provide clinical management services through an increased focus on interventions, which are likely to be increasingly valued in light of the shift to outcome-based payor and service models. For example, tailored

behavioral interventions that address neurocognitive and emotional factors can be introduced directly after an assessment, pilot tested by patients prior to feedback, and honed during the feedback session. Existing and future population-specific interventions are highlighted in most chapters of this handbook and may provide additional ideas to expand practice and intervention.

CLINICAL TAKEAWAYS

- Three core attributes—validity, applications, and value—have expanded the utilization of clinical neuropsychology since its beginnings in the 1960s.
- A focus on expanding the role of neuropsychology in each attribute will allow neuropsychological practice to thrive in evolving clinical, social, and technological landscapes.
- Clinical neuropsychology can continue to successfully evolve to meet the needs of patients and referral sources for science-based, population-specific services that inform neurocognitive diagnosis, treatment, functioning, and cognitive health promotion across the lifespan.
- Neuropsychology training, practice, and research are core in fueling the continued growth and relevance of neuropsychological assessment.
- Increasing the diversity of neuropsychologists and trainees is central to informing the creation of valid, culturally informed tests and assessment procedures, and enhancing training and research.
- Ideas to support the application and evolution of neuropsychology—including an increased focus on diverse populations, emerging areas of practice and research, and new applications—are highlighted in the current chapter and expanded upon in each chapter of the Handbook, in updated online supplemental resources, and in a new *Clinical Takeaways* section.

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