



# Division of Clinical Neuropsychology Newsletter 40

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## Neural Plasticity and Rehabilitation: What Neuropsychologists Should Know.

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### Abstract:

Neuropsychologists are often asked questions about brain development and recovery from brain injury. Central to these issues is neural plasticity. The dramatic neuroscience findings this past decade provide neuropsychologists with considerable understanding of brain plasticity. Despite compelling findings regarding the implications of this research to recovery of function following brain injury, clinicians may not be fully aware of this literature and the applicability of these issues to clinical practice. This paper provides a brief overview of some of the more salient experimental findings in the areas of developmentally derived, activity-based, and injury-induced brain plasticity with an emphasis on the latter. It is becoming apparent that the brain is far more malleable and shaped by our life experiences than ever imagined. An understanding of the factors that promote plasticity and integrating this knowledge into clinical practice may serve to optimize and improve clinical outcomes.

### Introduction:

Breakthroughs in neuroscience have made it necessary for clinicians working in brain injury rehabilitation to re-evaluate their conceptualization of recovery and treatment approaches. No longer can professionals rely on the notion that neurons are not able to repair or reproduce themselves. This paper will focus on the ability of the human brain to physically and functionally adapt to environmental conditions

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From The Editor

As you may recall, the last issue of *Newsletter40* was focused on Neuroimaging. The current issue however, is a more general issue, addressing a breadth of topics. Research topics covered in this issue include the assessment of behavioral changes in Neurological Patients, Neural Plasticity, and Dementia. In addition to the articles included in this issue, you can also find the minutes to the July 2004 Division 40 Executive Committee Meeting, as well as the APA programs for both Divisions 22 and 40. I hope that you find this information helpful in planning your time at APA. Once again, much thanks to all who have taken the time to contribute to this issue. We hope you enjoy this issue of *Newsletter40* and look forward to seeing you at APA!

Nancy D. Chiaravalloti, PhD  
Editor

## Self and Caregiver Ratings in Neurological Patients: What can patients tell us?

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Behavioral change related to brain damage has been noted since J. Harlow reported the case of Phineas Gage in 1848. While descriptions of behavior related to brain damage have been present in the neuropsychology literature for many years, good psychometric tools to quantify these non-cognitive behavioral changes are a more recent development. For example, brief, psychometrically sound measures of frontal system behavior have been developed only recently (see Malloy and Grace 2005 for a review). The problems of measuring behavior include how best to measure behavioral change and through whose eyes do we view this change: the patient, the caregiver, the clinician or an integration of multiple views.

It is important to quantify behavior changes for several reasons. Many behavioral descriptions developed in behavioral neurology are of “syndromes”, that is, behaviors that may occur together when a specific region of the brain is compromised. These syndromal descriptions often lack specificity. For example, a “frontal lobe syndrome” could include diverse behaviors such as apathy, impulse control problems, or loss of mental flexibility, and involve widespread networks in the brain that extend well beyond frontal cortical regions. In order to develop some precision in behavioral description and more tightly relate behavior to brain structures and functions, development of behavior rating scales that are reliable and valid is critical.

Additionally, behavior change related to brain damage can have a major impact on the lives of both patients and caregivers. For example, loss of bladder/bowel control and increased caregiver burden relate strongly to nursing home placement. Measurement of the degree of behavior change helps inform neuropsychologists’ interventions with patients and caregivers. Yet, special problems arise in measurement of behavior in neurological patients. The most commonly cited potential obstacle to reliable measurement is a patient’s lack of awareness, or insight due to brain damage.

Thus, we as neuropsychologists are faced with a dilemma of how best to measure our patient’s behavior. Some approaches have been clinician based rating scales, informant rating scales and self rating scales. Measures include parallel forms for informant and self ratings. Some instruments provide the potential to measure change from baseline to current behavior by relying on retrospective ratings. Each of these approaches has potential drawbacks. Within this article, we will address the use of parallel rating forms, agreement between raters, and the meaning of a lack of agreement between raters.

One could ask whether or not patients can reliably report information about their own behavior. There are indications that in fact neurological patients can provide self report data that is internally consistent. For example, with the Frontal Systems Behavior Scale (FrSBe, Grace and Malloy, 2001), reliability of patient self reports have been in the acceptable range. The FrSBe is rating scale with parallel forms for patient (Self) and informant (Family) report. The scale is designed to measure behavioral syndromes that have been associated with lesions in frontal-subcortical systems. Behaviors are rated retrospectively to provide a premorbid baseline and at the current time, to assess behavior since neurological insult or onset of disease. The scale yields a Total Score, as well as three subtest scores: Apathy, Executive, and Disinhibition. For the FrSBe Total Score, the reliability for frontal lesion patient self report was Cronbach’s alpha of .92 compared to .94 for family rating. Similar reliabilities were found for Self and Family ratings on the subtests.

On the other hand, when examining the validity of self- and caregiver-report data, discrepancies between patient and caregiver report are apparent. As an example, Wadley, Harrell, and Marson (2003) found that patients with Alzheimer’s disease tend to over estimate their ability to manage their finances when compared to caregiver report. When the AD patient’s actual performance on a direct assessment of their financial

capacity was used as a comparison point, AD patients tended to over-estimate their abilities while caregivers demonstrated both over- and under-estimation of financial errors. In other words, there were problems with the accuracy of both patient and caregiver estimation. By contrast, control participants and their family informants showed consistent, stable and accurate estimations of financial capacity. Thus, the presence of dementia in the dyad appears to impact both caregiver and patient report about an everyday activity.

In a recent investigation, Hoth et al. (2005) examined awareness of executive dysfunction in presymptomatic Huntington's Disease. Participants included a subset of individuals in the PREDICT-HD study, a NINDS funded investigation of early neurobiological and neurobehavioral markers in presymptomatic HD (NIH #NS40068, PI: Jane Paulsen, Ph.D.). Hoth et al. approached the issue of identifying problems with awareness by using the discrepancies between patient and companion ratings. Both patients and companions rated the frequency of patients' executive dysfunction on the FrSBe. Based upon discrepancies between their reports, three groups of patient-informant dyads were identified: 1) companion ratings greater than patient ratings, 2) patient-companion agreement, and 3) patient ratings greater than companion ratings. They found interesting relationships between poorer awareness of deficits and MRI, motor and cognitive measures. The patients who showed poorer awareness had smaller MRI caudate volumes, more HD motor symptoms, and worse performance on Trail Making B than participants who were in agreement with their companions' ratings.

Of interest in Hoth et al.'s study, participants who overestimated their symptoms compared to their companions' ratings had the highest depression scores. This finding underlines the issue of potential cognitive distortion due to depression further compounding problems in behavioral assessment. Snow et al. (2005) recently attempted to disentangle the contribution of depression and of awareness of deficits to self report measures of depression. They found that demented elderly patients underreport depression at high rates compared to clinician and informant reports. Interestingly, this was moderated

by deficits in awareness. Demented patients who had poorer awareness of deficits related to their dementia also reported fewer symptoms of depression.

Another approach to ascertaining the relative accuracy of self and caregiver report would be to relate behavior to biological markers such as markers of disease progression or lesion burden on MRI. Chiarvalotti and DeLuca (2003) examined behavioral consequences of Multiple Sclerosis. Participants with MS underwent neuropsychological testing, assessment of physical disease progression, and evaluation of emotional (depression, anxiety) and frontal systems behavioral status (FrSBe). They found that both patients' self ratings and family FrSBe ratings related to neuropsychological measures of executive control, working memory and information processing abilities. Further, the emotional measures (anxiety and depression) were within the normal range while the FrSBe self and family ratings indicated behavioral abnormalities, underlining the usefulness of adding assessment of frontal syndromes to an evaluation. In regard to raters, only the family ratings on the FrSBe correlated with disease progression.

The domain in which patient- and caregiver-report data have been most extensively studied is ratings for Quality of Life (QOL). There is great deal of debate as to whether or not QOL ratings for memory disorder patients should be gathered from patients or caregivers. On the one hand, it seems intuitively obvious that memory disorder patients may not be able to provide reliable and valid data about their lives. However, there is little empirical support for this hypothesis. In the absence of evidence that patient-report data is psychometrically inferior to caregiver-report data, and given that QOL is a highly subjective construct, many investigators believe it is desirable to at least attempt to gather QOL ratings from patients. Caregivers may be able to provide a great deal of information about patients but they will never have perfect access to their internal states and feelings. Furthermore, there is a ubiquitous finding in the QOL literature that caregivers report lower QOL than patients, regardless of patient's diagnosis. This trend suggests that one must question the validity of data coming

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## The Neuropsychological Profile of Alcohol-Related Dementia

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In recent years, there has been significant focus in the scientific literature (e.g., Huang, Qiu, Winblad, & Fratiglioni, 2002; Luchsinger, Tang, Siddiqui, Shea, & Mayeux, 2004; Stampfer, Kang, Chen, Cherry, & Grodstein, 2005) and media (e.g., Heslam, 2005; Reinberg, 2004) on a possible association between low to moderate alcohol intake and decreased incidence of dementia. Such studies, however, have serious limitations in terms of both internal and external validity (see Evans & Bienias, 2005; Schmidt & Libon, 2005). Furthermore, there is little to no attention within these publications on the neurotoxic effects of alcohol use. Several decades of research provide evidence for the adverse effects of alcohol on the brain (e.g., Butters, 1981; Harper, 1998; Oscar-Berman, Shagrin, Evert, & Epstein, 1997), and suggest that a dementia syndrome can be induced by chronic alcohol abuse (American Psychiatric Association, 1994; Oslin, Atkinson, Smith, & Hendrie, 1998). The actual prevalence rates of alcohol-related dementia among dementia populations vary across studies from approximately 2% (Schoenberg, Kokmen, & Okazaki, 1987) to 24% (Carlen, McAndrews, Weiss, Dongier, Hill, et al., 1994), depending on the participant samples employed by researchers. Such prevalence rates highlight the importance of assessing for alcohol-related dementia in geriatric patients presenting with neurocognitive impairments.

Alcohol consumption is associated with both neuropathological changes and neuropsychological deficits (Harper, 1998; Oscar-Berman et al., 1997). In general, neuroimaging and neuropathological research link chronic alcohol abuse with diffuse volume reductions in cortical and subcortical grey and white matter, although specific findings vary across studies (Jernigan, Butters, DiTraglia, Schafer, Smith, et al., 1991; Reed, Lasserson, Marden, Stanhope, Stevens, et al., 2003; Shear, Jernigan & Butters, 1994). Neuropsychological findings also differ within the literature, and range from more subtle problems related to impaired executive function and motor skills (Delin & Lee, 1992; Moriyama, Mimura, Kato, Yoshino, Hara, et al., 2002; Noel, Van der Linden, Schmidt, Sferrazza, Hanak, et al., 2001) to severe amnesia (Albert, Butters, & Brandt, 1981; Hunkin & Parkin, 1993; Moss, Albert, Butters, & Payne, 1986). The broad range in neuropathology and neurobehavior may be due, at least in part, to differing nosology and the highly variable inclusion/exclusion criteria employed by researchers. Examples of the existing terminology in the literature include: intact alcoholics (Ryan, Butters, Montgomery, Adinolfi, & Didario, 1980), non-Korsakoff alcoholics (Oscar-Berman, Kirkley, Gansler, & Couture, 2004), patients with alcohol-induced persisting dementia (American Psychiatric Association, 1994), alcohol-related dementia patients (Oslin et al., 1998), and patients diagnosed with Wernicke-Korsakoff syndrome (Butters, 1981; Butters & Brandt, 1985; Oscar-Berman et al., 2004). Variations in methodological criteria include: the age and gender of participants, amount of alcohol consumed, length of alcohol abuse, presence or absence of Wernicke's triad of symptoms (ocular abnormalities, ataxia, and a global confusional state), degree of amnesia, and overall intelligence level.

Oslin et al. (1998) have proposed and recently validated (Oslin & Cary, 2003) specific criteria for probable alcohol-related dementia (ARD). We were interested in looking at the neuropsychological profile of ARD patients based on Oslin et al.'s criteria in comparison to patients with Alzheimer's disease (AD), patients with vascular dementia (VaD), and normal geriatric controls (NC). The three comparison subgroups had no reported history of alcohol abuse. Unlike existing neuropsychology research (Munro, Saxton, & Butters, 2001; Saxton, Munro, Butters, Schramke, & McNeil, 2000), our three dementia subgroups were very comparable with respect to dementia severity, age, and education.

## **Methods**

### **Participants**

Fourteen patients diagnosed with ARD (Oslin et al., 1998) participated in the study. Inclusion/exclusion criteria were: (1) 35 alcoholic drinks per week for men (28 for women) for greater than a 5 year period, (2) a diagnosis of dementia for at least 60 days after last exposure to alcohol, (3) no history of an acute onset of symptoms associated with Wernicke encephalopathy (e.g. global confusional state, ocular abnormalities), and (4) a lack of focal neurological signs (except ataxia or peripheral sensory polyneuropathy). Additionally, fifteen AD patients (McKhann, Drachman, Folstein, Katzman, Price, et al., 1984), 13 VaD patients (Chui, Victoroff, Margolin, Jagust, Shankle, et al., 1992), and 20 healthy, community residing adults over age 60 (NC) were included in the study. No significant differences (all  $p > .05$ ) in age (mean in years = 79.2; SD = 5.8), education (mean in years = 12.0; SD = 2.9), or dementia severity (mean MMSE = 22.1; SD = 3.1) were identified across the three dementia subgroups. NC participants did not differ from the dementia subgroups with respect to age, but the NC subgroup tended to be more educated (mean in years = 14.0; SD = 2.7) and received significantly higher MMSE scores (mean MMSE = 28.6; SD = 1.0) than the three dementia subgroups.

### **Procedure**

A comprehensive neuropsychological protocol

that included tests of executive control, language, and memory was administered to all participants. Clock drawing (Libon, Swenson, Barnoski, & Sands, 1993) and the Boston Revision of the Wechsler Memory Scale Mental Control subtest (Lamar, Price, Davis, Kaplan, & Libon, 2002) were employed as measures of executive function. Language assessments included the Wechsler Adult Intelligence Scale-Revised Similarities subtest (Wechsler, 1981) and the Boston Naming Test (Kaplan, Goodglass, & Weintraub 1983). The Philadelphia (repeatable) Verbal Learning Test (Libon, Schmidt, Gallo, Penney, Swenson, et al., 2005) was used to assess memory functions, including learning, delayed recall, and recognition. All raw data from the above neuropsychological tests were converted to z-scores. The means and standard deviations of the NC group (see Schmidt, Gallo, Ferri, Sestito, Giovannetti, et al., under review) were used to compare the z-scores.

### **Statistical Analyses**

SPSS 12.0 for Windows was employed for all data analyses. After z-scores were computed, the scores were compared across participant subgroup via one-way ANOVAs. Post-hoc Tukey tests were used in these analyses to further describe differences between the groups.

### **Results**

Table 1 displays the mean z-scores across dementia subgroup. Based on this pattern of scores, the ARD subgroup performed similarly to the VaD subgroup but worse than the AD subgroup on tests of executive control. ARD patients' scores on delayed recall and recognition memory, however, were almost one standard deviation lower than the VaD subgroup, though the ARD patients displayed less impairment than the AD subgroup on the same memory tasks. Performance on learning and language measures were similar across the three dementia patient subgroups.

The one-way ANOVAs revealed significant differences in performance across subgroup (ARD, AD, VaD, NC) for all neurocognitive measures. Post hoc Tukey results identified significant differences ( $p < .05$ ) between the NC subgroup and all three

dementia patient subgroups on all neuropsychological measures. The results of the post hoc analyses for the dementia subgroups are reported in Table 1. No significant differences were identified between the ARD and VaD subgroups on any test of executive control, language, or memory. However, ARD patients received significantly lower scores than AD patients on both measures of executive control; the ARD patients also obtained significantly higher scores on the delayed recognition memory task than the AD group.

**Discussion**

These findings suggest that alcohol-related dementia may involve both cortical and subcortical systems based on our ARD participants' neuropsychological profile. When patient subgroups are matched for dementia severity, ARD patients exhibit very similar executive control deficits to subcortical dementia patients (VaD). However, our results suggest that ARD patients may also, in fact, demonstrate some degree of amnesia given that they appear to exhibit slightly more deficits in delayed verbal free recall and recognition than the subcortical group upon examination of neurocognitive profiles (see Table 1). Nonetheless, cortical dementia patients (AD) displayed considerably more impairment in memory than the

ARD patients, particularly with respect to recognition memory.

We did not identify any statistically significant differences between the ARD and VaD profiles. ARD appears to result in more substantial verbal memory deficits based on the finding that ARD participants received scores on delayed recall and recognition that are about one standard deviation below that of VaD patients; however, significant differences were not identified between our relatively small ARD and VaD subgroups (n=14 and n=13, respectively). Neuropathological findings from patients with long histories of alcohol abuse suggest cortical and subcortical pathology, but there is more consistency in the literature with respect to subcortical findings (e.g., Harper, & Kril, 1991). Thus, the clinical presentation of ARD may be more typically subcortical (VaD) than cortical (AD), though ARD patients do exhibit some evidence of amnesia and such memory deficits should be further explored.

Unlike measures of executive control and memory, performance on language tests did not differ across our three dementia subgroups. ARD, AD, and VaD patients were equally impaired on confrontational naming and verbal concept formation. A recent paper comparing the performances of AD and ARD patients on language

Table 1.

Mean z scores and post hoc results for comparisons between ARD patients and contrast groups

Cognitive Measure	Patient Groups			Tukey Test results
	ARD	AD	VaD	
Mental Control	-3.46	-1.09	-4.05	AD<VaD=ARD*
Clock Drawing	-1.64	-0.03	-1.42	AD<ARD=VaD*
Similarities	-1.86	-1.33	-2.33	ARD=VaD=AD
Boston Naming	-3.85	-4.46	-4.46	ARD=VaD=AD
Verbal Learning	-2.61	-2.83	-2.42	ARD=VaD=AD
Verbal Recall	-3.22	-3.90	-2.30	ARD=VaD=AD
Verbal Recognition	-5.00	-7.96	-4.16	ARD=VaD<AD*

Note. ARD = Alcohol-related dementia. AD = Alzheimer's disease. VaD = vascular dementia.

\*p < .05

measures (Boston Naming Test, Animal Fluency) indicated significant differences across subgroups, with AD being more impaired than ARD individuals on language tasks (Saxton et al., 2000); however, the ARD patients in the study appeared to score higher than the AD patients on the MMSE. To adequately compare neuropsychological profiles across various dementia subgroups, attempts should be made to equate the subgroups with respect to dementia severity, as well as additional factors such as age and education.

All three dementia patient subgroups demonstrated significantly worse performance than the NC subgroup on all neurocognitive measures. This finding underscores the effects of dementia on multiple neurocognitive domains. Although subcortical dementia may differentially affect executive control, learning and memory are also more impaired in this patient subgroup than in the NC group with similar age and education levels. The same is true for the cortical dementia patients who exhibit differential impairment on tests of memory: AD patients also exhibit deficits in executive control in comparison to NC participants.

This study has several limitations. The sample size, though consistent with previously published work, was somewhat small. It may be that a larger sample would allow for the identification of statistically significant differences between ARD and VaD patients on memory measures, particularly with respect to verbal recall and recognition. The ARD profile in Table 1 is suggestive of differential impairment in executive control, though deficits in memory are also evident. Future work should expand upon our findings with respect to sample size as well as the addition of other memory measures (e.g., visual memory).

The utilization of Oslin et al.'s criteria does not rule out the presence of Wernicke-Korsakoff syndrome in ARD patients. Though our inclusion criteria included no history of an acute onset of symptoms associated with Wernicke encephalopathy, there is a body of literature suggesting a gradual progression of neurocognitive symptoms or a substantial time period of subclinical symptoms in patients with Wernicke-Korsakoff syndrome (e.g., Bowden, 1990; Ryan et al., 1980;

Ryback, 1971). Despite the distinctions in terminology between Wernicke-Korsakoff and non-Korsakoff alcoholics within the neuropsychology literature (Butters & Brandt, 1985; Oscar-Berman et al., 2004), Bowden (1990) indicates that many neuropathologists do not make this differentiation due to the widespread neuropathological changes in alcoholics regardless of a clinical diagnosis of Wernicke-Korsakoff syndrome. For example, postmortem studies report a high incidence of Wernicke-Korsakoff pathology in alcoholics without any antemortem clinical presentation of the syndrome (Harper, 1983).

Lastly, we cannot rule out the presence of another neurodegenerative dementia such as AD or VaD in our ARD patient subgroup. Emerging findings, however, from the same ARD patient subgroup (unpublished data) suggest that neurocognition may improve or at least remain stable in the ARD subgroup following abstinence from alcohol. This is not likely in other dementias, particularly with a neurodegenerative disorder such as AD.

In summary, our findings suggest a distinct neurocognitive profile of ARD patients, as defined by Oslin et al., that includes executive control deficits as well as impairments in memory; these neuropsychological findings may be indicative of both cortical and subcortical pathology. Further work is warranted in larger samples of patients with the inclusion of additional memory assessments (i.e., visual learning and memory). Neuroimaging and neuropathological studies in conjunction with neurobehavioral assessment are of particular interest. Nonetheless, these data have important implications for the effect of chronic alcohol consumption on neurocognition in geriatric populations. We suggest caution in recommending any consumption of alcohol to older adults, particularly individuals being evaluated for a suspected dementing illness. The findings also underscore the importance of assessing for an alcohol-related dementia in geriatric populations with neurocognitive complaints, particularly since some reversal or arresting of symptoms may be possible in ARD with abstinence from alcohol.

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**Neural Plasticity and Rehabilitation:**

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and brain injury.

Neuroplasticity is defined as the capacity of nerve cells to fight the chemical and structural changes that can eventually kill them, if not controlled. It can also refer to the ability of nerve cells to modify their activity in response to changes in the environment, to store information from the environment, and to permit the organism to move about and survive (Stein, Brailowsky & Will, 1995)

There are three general types of plasticity: These include the following: 1) *developmental plasticity* or the process of the immature brain being shaped by early life experiences; 2) *activity dependent plasticity* which can be brought about by years of intensive practice of a skill (such as musical training) and *learning and memory* or the formation of new connections made through experience and knowledge acquisition, and 3), the main topic of this paper which is *injury induced plasticity* or the altering of the balance of activity in the brain due to trauma.

Research suggests that the brain is very plastic or malleable in response to one's environment and life experiences. The central nervous system is continuously adjusting to our environmental experiences. Stimulating environments can lead to expanded cortical areas, greater neuronal organization, more branching, and increased rates of neuronal survival. Conversely, physiological activity and structural development can also be adversely affected by a stimulus-deprived environment, emotional trauma, and caretaker neglect (Huttenlocher, 2002).

**Terminology:**

The study of neuroplasticity brings with it a new vocabulary. Below is a primer or quick reference of some commonly used terms.

**Axonal Sprouting:** The ability of the adult brain to form new axons following damage to existing axons in areas denervated by a lesion.

**Diaschisis:** Depressed metabolic activity in different brain areas in response to injury; reduced neuronal activity at sites distant to the injury (Stein, 2003).

**Equipotentiality:** The idea that anatomically distinct areas of the brain have the capacity to mediate a rather wide variety of disparate functions.

**Excitotoxicity:** Process by which neurons can become over stimulated and release glutamate into the brain. Excess glutamate introduces a massive amount of calcium into the nerve cells, activating enzymes that kill the neuron from within (Stein et al, 1995).

**Habituation:** A decreased response to a stimulus.

**Kennard Principle:** Principle that argues that recovery from a focal lesion is superior if the lesion occurs early in development rather than in adulthood.

**Neurogenesis:** The production of new neurons from immature progenitor cells. This can occur throughout the lifespan.

**Pruning:** The developmental mechanism by which the brain eliminates neurons that are too inactive.

**Supersensitivity:** A neurons' ability to adjust at the pre-synaptic or post synaptic site to a reduction in stimulation following injury. Adaptations can include change in the number of post-synaptic receptors, change in the release or re-uptake mechanism for neurotransmitters.

**Synaptogenesis:** The production of new synaptic connections occurring throughout the lifespan.

**Vicariation:** The concept that the developing and mature central nervous system has a certain number of redundant or "backup" neuronal connections, networks, and fiber tracts that participate in the takeover of lost functions post brain injury. This includes the situation in which areas not normally involved in mediating certain types of behaviors can take over those functions under the right circumstances (Stein et. al., 1995).

**Neuroplasticity in the intact brain:**
**Developmental Plasticity**

Developmental plasticity refers to the significant shaping of the immature brain by life experience. Though children have more neurons and synapses than adults, they lose a massive number of neurons and synapses during adolescence through pruning (Rajapakse, DeCarli, McLaughlin. et al., 1996). This process is thought to be adaptive because it

allows the central nervous system to develop greater specificity to the environmentally specific needs of the organism. Specifically, those neuronal networks which are not sufficiently used are eliminated and those frequently used expanded and more interconnected.

Early plasticity is greatest because many synapses and neurons have not yet been pruned. As the human child develops, neurons are pruned and the brain loses its capacity to adapt as effectively to change. For instance, children exposed to a second language as pre-adolescents are able to learn the language faster and demonstrate better pronunciation skills (i.e. no accent) than individuals who study the language later in life (i.e. late adolescence, adulthood). Moreover, if a child becomes proficient in a second language, but then abstains from speaking that language prior to adolescent pruning, he/she is at risk for losing their command of the language. This principle applies to the acquisition of other skills as well (e.g. music).

Several studies have demonstrated that the environment can have a profound influence on the brain development. Animals raised in stimulus rich environments with toys and challenging obstacles have more dendritic branching and more synapses per neuron than animals without this stimulation (Johansson, 2000). Use of an exercise wheel in mice has been shown to increase brain trophic factor levels known to promote progenitor cell survival and improve memory. Enriched conditions are known to result in increased rodent hippocampal thickness, arborization, and number of glial cells (Johansson, 2000).

Early developmental plasticity is not always adaptive for the organism. Understimulating environments can cause less neuronal branching, less neurogenesis and major neuronal loss (Huttenlocher, 2002). The interaction of the brain's plasticity and adverse environmental conditions is not a new idea. Spitz and Wolf (1946) compared infants raised in an orphanage who were exposed to little human contact with infants raised by their mothers in prison. Orphan infants performed better on developmental testing at 4 months. At two years, however, the children raised in prisons showed normal development in the areas of walking and

language development relative to the orphan children who tested far below average. The authors concluded that lack of stimulation and experience during critical periods for walking and speech development had profound effects on development.

### **Neuroplasticity in the intact brain: Activity dependent, and learning/memory plasticity:**

Sustained engagement in cognitively stimulating activities has been found to effect neural structures in humans (Ramachandran, 1993). Functional MRI studies on London Cab drivers found that their right posterior parietal lobe (a region of the brain responsible for following geographic directions) was largely expanded relative to controls. The authors hypothesized that the relative size difference was due to the cab driver's prolonged use of this area of their brain. Moreover, there was a statistically significant correlation between the volume of brain region and the years of experience and proficiency (Maguire, et al., 2000).

Cortical representation areas, called cortical maps, can be modified by sensory input, experience, and learning. If a person regularly performs a skilled motor task, the cortical representation of that area will be enlarged, as seen for the motor cortex of the left but not the right hand of string instrument players (Elbert, Pantev, Weinbrunch, Rockstroh, & Taub, 1995). Munte (2002) reported significant neuroplastic changes in musicians' brains as a function of the extent and complexity of music stimulus exposure. In another study, Karni (1995) had healthy human subjects undergo daily practice of a complex motor task with increasing performance demands for 4 weeks. Functional MRI scanning revealed increased motoric activation in the area responsible for this task.

Physical and mental exercise can increase levels of brain deprived neurotrophic and other growth factors, stimulate neurogenesis, increase resistance to insult, and improve mental performance (Cotman & Berchtold, 2002). In addition to the benefits neurons receive from a stimulating environment, there is some evidence that glial cells are responsive to environmental stimulation. Specifically, astrocytes change rapidly in response to changes in

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**APA Division 40,  
2005 Convention Program Schedule**

**Thursday, 8-18-05**

- 8:00-8:50 Discussion: P Kaufmann PhD, "Should you release test protocols? It depends on state law". Chair: G Lee PhD.
- 9:00-9:50 Symposium: V. Berninger PhD, "Contribution of cognitive and neuropsychological processes to response to instruction".  
Chair: T Roebuck PhD
- 10:00-10:50 Invited Address: R Bull PhD, "Applying cognitive paradigms to diverse populations".  
Chair: K Espy PhD.
- 8:00 - 10:50 Executive Committee Meeting. Chair: R Ivnik, PhD
- 11:00 - 11:50 Keynote Address: J Grafman PhD, "The Social Preoccupation(s) of the Human Prefrontal Cortex". Chair: R Ivnik PhD.
- 12:00-12:50 Blue Ribbon Award Winners. Chair: K Espy PhD.  
Poster Session: Pediatric Neuropsychology, TBI, Rehab. Chair: E Ryan PhD.
- 1:00-1:50 Keynote Address: G R Lyon PhD, "Why Scientific Evidence should inform neuropsychological and educational practices: A research to policy perspective". Chair: K Espy PhD.
- 2:00 - 2:50 Invited Address: H G Taylor PhD, "Developmental Consequences of Extremely Low Birth Weight". Chair: S Hunter PhD.
- 3:00 - 3:50 Invited Address: H J Hannay PhD, "The cerebral commissures in Spina Bifida Meningomyelocele: Myths and Realities of Structure and Function".  
Chair: J Bobholz PhD
- 7:00 – 7:50. WIN & EMA Career Mentoring Discussion Hour
- 8:00 – 8:50 EMA Student Mentoring Discussion Hour

**Friday, 8-19-05**

- 8:00-9:50 Symposium: N Abeles PhD, "Meet the NIH: Workshop for New Investigators". Chair: J Bobholz PhD. (Co-sponsored with Division 17)
- 9:00 - 9:50 Early Career Award. K Espy PhD, "Development of Executive Control".  
Chair: G Lee PhD.
- 10-10:50 Benton Lecture. M Meier, PhD
- \*\* Presidential Plenary Programming: A Puente PhD, "New CPT testing codes"\*\*
- 2:00 - 2:50 Invited Address: E Bigler PhD, "MRI & the future of the relevance of neuropsychology". Chair: J Bobholz PhD.
- 3:00 - 3:50 Invited Address: T Goldberg PhD, "Genes That Influence Human Cognition: Implications for Individual Differences and Neuropsychiatric Disorders".  
Chair: K Mason PhD  
Conversation Hour: G Gioia PhD, "Innovative care in Pediatric Neuropsychology: Executive Function & Concussion".  
Chair: T Roebuck PhD.
- 4:00 - 4:50 Invited Address: D Tranel PhD, "Neural correlates of emotion, decision-making, and social conduct". Chair: S McPherson PhD.

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- 5:00-5:50 Invited Address: R Haley MD, "Gulf War Syndrome: A Cholinergic System Dysfunction?". Chair: E Ryan PhD.  
Invited Address: D Fein PhD, "Recovery in Autism: Does it happen? What does it mean?". Chair: S Hunter PhD.

### **Saturday, 8-20-05**

- 8:00 - 8:50 Symposium: W Adams PhD, "WRAML2: New test modifications and clinical applications". Chair: M Basso PhD.
- 9:00 - 9:50 Invited Address: J Lucas PhD, "Improving diagnostic accuracy of dementia in African American elders: Lessons from Mayo's Older African Americans Normative Studies (MOAANS)". Chair: R Ivnik PhD.
- 10:00 - 10:50 Invited Address: J Sweet PhD, "Status of Malingering Detection in Forensic Neuropsychology", Chair: M Schulteis PhD
- 11:00 - 11:50 Symposium: L Terryberry-Spohr PhD, "Assessment & management of concussion in high school athletes". Chair: A Moore PhD.  
Poster Session: Aging, Dementia, & Testing. Chair: S McPherson PhD.
- 12:00 - 1:50 Symposium: J DeLuca PhD, "Cognitive rehabilitation interventions across clinical populations: Research, applications, and implications for public policy". (Co-sponsored with Division 22)
- 1:00-1:50 Symposium: H Denison PhD, "Memorial symposium in honor of Harold Goodglass". Chair: M Basso PhD
- 3:00 - 3:50 Fellows Address. Chair: E Fennell PhD.
- 4:00 - 4:50 Division 40 Presidential Address, R Ivnik PhD, "Working in the Borderland: Lessons from MOAANS Research". Chair: K Haaland PhD.
- 5:00 - 5:50 Division 40 Business Meeting. Chair: R Ivnik, PhD.
- 6:00 - 7:50 Division 40/22 Social Hour. Chair: J Donders PhD.

### **Sunday, 8-21-05**

- 8:00 - 8:50 Invited Address: B Hermann PhD, "Epilepsy through the ages: Developing a lifespan perspective of the neurobehavioral consequences of the epilepsies".  
Chair: G Lee PhD.
- 9:00-9:50 Symposium: J Jackson PsyD, "Neuropsychology and critical illness: Issues and advances". Chair: S Woods PsyD.  
Symposium: C. French, "Neurodevelopmental effects of early exposure to toxins".  
Chair: B Slomine PhD.
- 10:00 - 10:50 Invited Address: E Martin PhD "Substance Dependence and NeuroAIDS". Chair: K Mason PhD.  
Workshop: W Ernst PsyD, "Neuropsychological Consultation with School Personnel: Techniques for Enhancing Effectiveness". Chair: J Donders PhD.
- 11:00-11:50 Symposium: M Maroutidis PsyD, "Neurocognitive Dysfunction in Substance Abuse: Opportunities for Cognitive Remediation". Chair: S Woods PsyD.  
Symposium: M Rohling PhD, "Evidence based evaluation of Clinical Disorders: Lessons from pediatric/forensic neuropsychology". Chair: B Slomine PhD
- 12:00 - 12:50 Poster Session: Cognitive & Med/Psych. Chair: M Schulteis PhD.
- 12:00-2:00 Symposium: D Shurtleff PhD, "Neurobiological Aspects of Drug Addiction: Implications for Treatment". (Co-Sponsored with Division 28)
- 1:00-1:50 Discussion Hour: M McCartney-Filgate, "Incivility and Its Discontents: Professional Conduct in Peer Reviews". Chair: S Woods PsyD.

**APA Division 22,  
2005 Convention Program Schedule**

**Thursday, 8-18-05**

- 10:00 - 11:50     Symposium: G Reed PhD, M A DiCowden PhD, D J Lollar EdD, R J Simeonsson PhD, W Coster PhD, “Utility of the International Classification of Functioning for Psychology”. Chair: D J Lollar EdD.
- 12:00 - 12:50     Workshop: L A Taylor PhD, J S Kreutzer PhD, “Innovative Tools for Effective Family Intervention Following Neurotrauma”. Chair: J S Kreutzer PhD.
- 2:00 - 3:50        Invited Symposium: A W Heinemann PhD, R Fraser PhD, J D Corrigan PhD, C H Bombardier PhD, R Brannon, MSPH, MA, “State of the Science - Evidence Based Practice in Rehabilitation Psychology: How Science Can Improve Clinical Practice”. Chairs: A W Heinemann PhD, D S Tulsy PhD. (Co-sponsored: Division 38 and Division 22)
- 5:00 - 6:50        Division 22 Social Hour: Chair: D S Tulsy, PhD.
- 7:00 - 8:50        Symposium: A A Rizzo PhD, K Graap PhD, H Hoffman PhD, M T Schultheis PhD, B K Wiederhold PhD, “Virtual Reality Applications in Psychology and Rehabilitation—The First 10 Years and the Next”. Co-Chairs: A A Rizzo PhD, B K Wiederhold PhD.

**Friday, 8-19-05**

- 8:00 - 9:50        Invited Symposium: M T Barisa PhD, C D Callahan PhD, J E Ware Jr. PhD, B J Boon PhD, J D Hunsley PhD, “The Six Ps of Outcome”. Co-Chairs: C D Callahan PhD, M T Barisa PhD. (Co-sponsored: Division 22 and Division 12)
- 10:00 - 11:50     Division 22 Poster Session: Chair: D S Tulsy.
- 12:00 - 1:30       Division 22 Presidential and Fellows Address: A W Heinemann PhD, C H Bombardier PhD, K Cicerone PhD. Chair: R G Frank PhD.
- 2:00 - 3:50        Invited Symposium: K J Hagglund Ph D, R M Kaplan PhD, R G Frank PhD, P H DeLeon PhD JD, R A Vachon III Ph D, “Critical Issues in Health Care — Covering the Uninsured”. Chair: D S Tulsy PhD. (Co-sponsored: Division 22 and Division 38)
- 4:00 - 4:50        Invited Symposium: J Manly PhD, J E Helms PhD, M E Banks PhD, “Effective Strategies for the Study of Race in Research and Practice”. Chair: D S Tulsy, PhD.
- 5:00 – 5:50        Invited Address: J S Kreutzer PhD, The Leonard Diller Honorary Lecture. “All I Really Need to Know I Learned From Patients and Their Family Members” Chair: A W Heinemann PhD.

**Saturday, 8-20-05**

- 10:00 - 11:50     Symposium: D S Tulsy PhD, S M Bruyere PhD, F Balcazar PhD, C B Keys PhD, L R Mona PhD, J A DePhillips MA, “Accessibility and Community Inclusion—The Role of the Rehabilitation Psychologist”. Co-Chairs: B Hernandez PhD, D S Tulsy PhD.
- 12:00 - 1:50       Invited Symposium: K Cicerone PhD, A R O’Brien PhD, M Hibbard PhD, R Nitkin PhD, G W Rebok PhD, D Pedulla, JD, “Cognitive Rehabilitation Interventions Across Clinical Populations—Research, Applications, and Implications for Public Policy”. Chair: J DeLuca PhD. (Co-sponsored: Division 22 and Division 40)

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2:00 - 5:50 Executive Committee Meeting: Chair: A W Heinemann PhD.  
6:00 – 7:50 Division 40/22 Social Hour

### **Sunday, 8-21-05**

9:00 - 9:50 Symposium: R A Hanks PhD, M T Schultheis PhD, R Healing, “Assessing Driving Ability—Balancing Individual’s Independence and Public Safety”.  
Co-Chairs: M T Schultheis PhD, R A Hanks PhD.  
10:00-11:50 Workshop: L R Shaw PhD, S L West PhD, F Chan PhD, “EEOC Research Project in Disability and Employment Discrimination.” Chair: B T McMahan PhD.

stimulation patterns. Rats raised in challenging environments exhibited more contact between their astrocytes and neurons than rats in standard cages (Jones and Greenough, 1996). Johansson (2000) indicates that a good example of the pliable nature of the brain is shown in the synapse of these animals raised in environments with toys and challenging obstacles. These animals develop more dendritic branching and more synapses per neuron than animals without this stimulation.

In a recent well-controlled study, Ball et al. (2002) used cognitive interventions reported in a geriatric population to reverse cognitive aging by 7-14 years in the area of visual concentration, reasoning and memory. The authors concluded that neural plasticity endures across the lifespan, and that cognitive stimulation in the environment is an important predictor of enhancement and maintenance of cognitive functioning across the life span.

Conversely, inactivity and impoverished environment can lead to detrimental effects on the organism. Ornstein & Swencionis (1990) reported that social isolation or loneliness kills more people than any other disease. "At all ages, for both sexes and all races in the US, the single, widowed, and divorced die at rates from 2 to 10 times higher than married people". "Depression and chronic stress, which have been shown to result in elevated glucocorticoid levels in humans, can cause premature aging as measured by atrophy in the hippocampus" (Sheline, 2000).

### **Neuroplasticity Post Brain Injury: Mechanisms of recovery**

After brain injury, postsynaptic neurons attempt to adjust to reduced stimulation through several processes including forming more receptors, slowed reuptake, and receptor upregulation (Stein, Brailowsky, & Will, 1995). This is called denervation supersensitivity or hypersensitivity. Stein (1995) gives the example that when presynaptic neurons are damaged resulting in decreased acetylcholine output, the postsynaptic terminals may become 1000-10,000 times more sensitive such that muscle contractions may occur despite reduced acetylcholine. Denervation

hypersensitivity also occurs when presynaptic axon terminals are damaged or destroyed and the post synaptic membrane becomes more sensitive in response to transmitters released from nearby axons (Creese, Burt, & Snyder, 1977).

Research suggests that other areas of the cortex may take over functions of the damaged area (Schallert, Fleming, Woodlee, 2003; Silverstrini et al., 1995; Yang, Gallen, Ramachandran, 1994; Seitz, Hoflich, Binkoski, & Freund, 1998) and there may be latent synapses, neurons, and fiber tracts that may become "unmasked" following brain injury. Cao, Vikingstad, Huttenlocher (1994) used fMRI with a group of young adult patients who had histories of unilateral brain lesions from pre & perinatal stroke and resultant hemiparesis. FMRI showed evidence of reorganization of motor cortex function to the side ipsilateral to the hemiparetic side in all subjects. The ipsilateral area of increased activation was posterior to the postcentral gyrus. This study also outlines the functional importance of the uncrossed corticospinal pathway.

Lee and Donkelaar (1995) provide an example of relatively large latent fiber tracts which become active after an injury to the motor cortex. Approximately 25% of corticospinal tract fibers (responsible for voluntary motor movement) remain uncrossed at level of medulla and 10-15% remain uncrossed throughout spinal cord. These ipsilateral, uncrossed pathways are suggested to play a role in recovery of unilateral cortical damage (Lee et al 1995). Recent research has shown that the ipsilateral motor and somatosensory cortex is more active after injury of the contralateral motor cortex, when performing motor movements.

### **Neuroplasticity Post Brain Injury: Clinical implications**

The once held belief that recovery from brain injury is limited to the first one to two years following injury has been met with considerable challenge. Neuroplasticity research suggests that people can recover for many years, but on a continuum whereby recovery is easier and faster earlier and becomes increasingly more difficult as time progresses. Multiple studies have shown that the majority of people continue to make significant

physical, cognitive, and behavioral recovery, as many as 5 years or more post Traumatic Brain Injury (TBI) (Laatsch, Pavel, Jobe, Lin & Quintana, 1999; Sbordone, 1990; Thomsen, 1981; Klonoff, Low, & Clark, 1977). Stein (1995) states that “There is no rule of neuroscience that the processes of functional recovery must occur rapidly, or that treatment should be terminated after a fixed period of time because the early results are unsatisfactory”.

Another commonly held misbelief by clinicians is that the Kennard principle is always correct. The Kennard principle states that recovery from a focal lesion is superior if the lesion occurs early in development rather than in adulthood. By contrast, research has shown that if an injury is too early or occurs before or during certain critical (sensitive) periods (times of increased plasticity) early recovery from brain injury may not be as extensive as with brain injury occurring later. For example, monkeys raised with one eye sutured from birth to six months were permanently unable to see from that eye after the sutures were removed. This same procedure applied to adult monkeys did not produce a comparable effect. Thus the critical period for establishing the visual cortex is during the first 6 months of development in monkeys (Hubel & Weisel, 1977).

Plasticity is not always without a cost. Increased plasticity of the young brain may allow it to compensate for one impairment, but this may be at the expense of some other later developing function. For example, children who undergo left hemisphere damage or removal may develop language in the right hemisphere but at the risk of visuospatial impairment developing later in life. Hence some research (Banich et al., 1990) suggests that children may “grow into a deficit.”

### **Rehabilitation and Neuroplasticity:**

Does neurorehabilitative therapy facilitate the brain’s plasticity? Evidence would suggest yes. The effectiveness of therapy is directly related to its ability to physiologically and/or structurally alter the brain. Nudo (1996) showed that physical therapy allowed reorganization of the motor cortex in primates. Laatsch and colleagues (1999) demonstrated that an average of 15.8 sessions of

cognitive rehabilitation therapy accompanied by homework assignments in persons 2 years post injury significantly altered brain functioning as measured by neuropsychological testing and SPECT data (i.e. regional cerebral blood flow). Paquette and colleagues (2003) demonstrated using PET that psychotherapy has the potential to modify dysfunctional neural circuitry associated with anxiety disorders.

Neural reorganization can be enhanced through specific training rather than general experience. Nudo and colleagues demonstrated that specific motor training procedures, following stroke in primates, can cause cortical representation of the hand to spread into areas of the cortex representing more proximal portions of the limb (Nudo, Miliken, Jenkins, & Merzenich, 1995). Conversely, in the absence of post injury rehabilitative therapy, the surrounding tissue undergoes further territorial loss in the functional representation of the affected body part (Nudo & Miliken, 1996). Whether this is due to “learned nonuse” (Taub 1993) or to disruption of local cortical circuitry remains to be determined. These studies support clinical observations made by rehabilitation professionals that argue against the notion of generalizability of skill development and advocate for functional rehabilitation (i.e. training to a specific task within the patient’s own environment).

Though compensatory strategies can be enormously helpful to people post brain injury, plasticity research suggests that the appropriate timing of teaching these strategies may be an important and complex issue. For instance, if compensatory strategies are implemented too early, those parts of the brain undergoing plastic changes may not get used enough or receive the optimal amount of stimulation to effectively undergo this process. Cohen (1999) suggests that if compensation is allowed, true recovery will not happen. Therefore the decision about when to focus on compensatory strategies is not simple and may depend on several factors. However, there does not appear to be a consensus regarding the identification of these factors.

Conversely, there is a body of research suggesting that too much activity too early post

injury in a damaged brain area or area adjacent to such damage can also lead to an adverse outcome (Schallert and colleagues, 2003 Schallert, Kozlowski, Humm, et al.,1997). For example, if the unimpaired limb is restrained immediately after the lesion to force the animal to use the impaired limb, the behavioral deficit is increased, with less ultimate recovery, accompanied by more neural injury. Thus, immediate forced use of the impaired limb appears to amplify the amount of secondary neuronal cell death that occurs after the brain lesion.

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**Self and Caregiver**  
Continued from page 4

from caregivers as much as from patients.

Researchers recently began gathering QOL reports from patients diagnosed with mild to moderate Alzheimer's disease (AD) and Mild Cognitive Impairment (MCI) and compared agreement of these reports to data provided by knowledgeable caregivers. Correlations are typically small to moderate in magnitude (Novella et al., 2001; Selai et al., 2001; Logsdon et al., 2002; Ready et al., 2004). For example, Ready et al. (2004) reported that mean patient-caregiver agreement correlations for MCI patients was .24 and for mild AD patients was .48. The difference between these mean correlations was not statistically significant. These results indicate that there is a fair amount of discrepancy between patient and caregiver ratings.

QOL studies have also attempted to discern which source of data is more reliable and valid. Validity evidence indicates that caregiver-reported QOL data is associated with dementia severity, functional impairment, neuropsychiatric symptoms, social/recreational activities, and caregiver factors (Albert et al., 1996; Karlawish et al., 2001; Kerner et al., 1998; Selai et al., 2001; Ready et al., 2004). Patient report data generally is associated with fewer factors, such as social/recreational activities, dementia severity, and neuropsychiatric symptoms (Selai et al., 2001; Ready et al., 2004).

Internal consistency reliability data of patient QOL ratings are typically adequate and are comparable to reliabilities of caregiver-report data (Brod et al., 1999; Logsdon et al., 2002; Selai et al., 2001; Ready et al., 2004). Recent findings regarding patient insight into their dementia severity indicates that patients with poorer insight may provide data that are less internally consistent than data from patients with better insight (Ready et al., 2005). These are some of the first data that identify an individual difference factor that may be associated with the reliability of patient-report data.

Overall, there are no compelling data indicating that patients in the mild to moderate stages of dementia severity are not able to provide valid information about their QOL, particularly when they

have some degree of insight into their impairments. It is well established that patients and caregivers have different perspectives on patient QOL, with caregivers rating QOL worse than patients (Logsdon et al., 2002; Ready et al., 2004).

In conclusion, measuring non-cognitive behavior presents challenges regarding how best to measure behavioral change and through whose eyes to view such change. Until more definitive data are gathered about the strengths and weaknesses of patient and caregiver-report data, the most reasonable approach to measuring behavioral changes and QOL in neurological patients, or any other subjective construct for that matter, is to gather as much information as possible from both patients and caregivers. There are complex issues related to the interpretation of information provided by multiple observers of patient behavior and of patient's subjective experience. The intersection of this information with patient self-awareness, and cognitive distortions due to psychiatric disorders will provide fertile ground for future work.

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**Announcement**

This year's 17th Annual National Meeting of the organization Children and Adults with Attention Deficit Hyperactivity Disorder will be held on October 27-29, 2005 in Dallas, Texas. The meeting is attended by between 1,500 and 2,500 people, approximately half of whom are professionals. Each year the meeting offers a poster session of scientific papers dealing with issues related to ADHD. A student research award is also given. Last year's poster session featured thirty papers by a diversity of graduate students, psychologists and physicians. Submitted papers will be considered through September 15, 2005.

Information about submitting papers can be found at:

[http://convention2.allacademic.com/chadd\\_index.php](http://convention2.allacademic.com/chadd_index.php)

More information may be found on our website at:  
[http://www.chadd.org/WEBPAGE.CFM?CAT\\_ID=14&SUBCAT\\_ID=26&SEC\\_ID=30](http://www.chadd.org/WEBPAGE.CFM?CAT_ID=14&SUBCAT_ID=26&SEC_ID=30)

### Division 40 Early Career Award

Division 40 announces the Early Career Award in Neuropsychology for an APA member psychologist not more than ten years post doctoral degree who has made a distinguished contribution to neuropsychology in research, scholarship, and/or clinical work.

A letter of nomination and three supporting letters (at least two from nationally-known neuropsychologists familiar with the candidate's work and its impact on the field) should be included along with five copies of (1) a CV, (2) three supporting documents providing evidence of national/international recognition (e.g., major publications, research grants, assessment, clinical, or teaching techniques, treatment protocols), and (3) the candidate's 500 word statement describing professional accomplishments, personal long-term goals, and future challenges and directions in the field of neuropsychology that they wish to address.

The awardee receives a certificate and \$1,000 and will be invited to present a paper at the August 2006 APA convention. The deadline is December 1, 2005. Send nominations to: Gregory P. Lee, Ph.D., ABPP, Chair, Division 40 Awards Committee, Department of Neurology (BA-3278), Medical College of Georgia, Augusta, GA, 30912-3275.

### Division 40 Listserv Information

Division 40 offers three listservs that are open to all interested individuals. To join a list, send an e-mail message to [listserv@lists.apa.org](mailto:listserv@lists.apa.org). The subject line should be blank. The message should read: SUBSCRIBE Listname First Last [substitute the name of the list you wish to join and your own first and last names]. For example, if Jane Brain wishes to join the ANNOUNCE listserv, she would write SUBSCRIBE DIV40ANNOUNCE Jane Brain.

- DIV40ANNOUNCE is an announce-only list created to allow members to receive information from the Division about divisional activities and advocacy efforts relevant to clinical neuropsychology. The list administrator is Paula K. Shear, Ph.D.: [paula.shear@uc.edu](mailto:paula.shear@uc.edu)
- DIV40EMA is a discussion forum for the Division 40 Ethnic Minority Affairs Interest Group, which focuses on professional development for neuropsychologists and students who are members of ethnic minority groups as well as the promotion of culturally competent research and practice among all neuropsychologists. The list administrators is Jovier Evans: [jevans2@iupui.edu](mailto:jevans2@iupui.edu). The EMA group is chaired by Drs. Monica Rivera-Mindt and Tony Wong: [riveramindt@fordham.edu](mailto:riveramindt@fordham.edu) and [twong@unityhealth.org](mailto:twong@unityhealth.org)
- DIV40WIN is a discussion forum for the Division 40 Women in Neuropsychology Interest Group, which focuses on professional development of women and efforts to increase the representation of women in leadership positions. The list administrator and WIN chair is Dr. Cynthia Kubu: [kubuc@ccf.org](mailto:kubuc@ccf.org)

DIVISION 40 EXECUTIVE COMMITTEE  
MEETING MINUTES

Wednesday, July 28, 2004 7:30-10:30 AM  
Hilton Hawaiian Village, Sea Pearl Suite IV  
Honolulu, Hawaii

Present: Drs. Axelrod, Bauer, Craig, Elliott, Espy, Fennell, Fischer, Haaland, Heaton, Ivnik, Koltai-Attix, Manly, Pliskin, Shear, Silver, van Gorp, Yeates

Invited Guests: Virginia Holt and Patricia Kabor (APA Science Directorate), Randy Phelps (APA Practice Directorate), Michael Cole (ANST), Chris Loftis (ANST), Glen Getz (ANST), Deborah Weber (ANST)

1. The meeting was called to order by Dr. Haaland at 7:30 AM. She thanked the Division 40 Executive Committee (EC) and the Committee Chairs for attending this morning's meeting and for all of their work in the preceding months.

2. Secretary's Report: The minutes of the February 2004 EC meeting were reviewed and approved. Dr. Shear reported on the status of the new DIV40ANNOUNCE listserv for our general membership. We will continue to post announcements about this listerv in each newsletter and division mailing, because APA regulations do not permit us to add members to this list unless they request to be included.

3. Treasurer's Report: Our May 2004 fund balance was a healthy \$271,445.32. With judicious use of Division funds this year, our income should be sufficient to cover our expenses, and we can make a modest contribution to our reserves. Division 40's dues restructuring and increase from \$20/year to \$34/year (\$29 /year dues base + \$5/year division publication fee) went into effect for the 2004 dues year. This has had a substantial positive impact on our income, without any adverse effect on our membership numbers.

Expenses for all line items in the Division 40 budget are at or below budget, based on reimbursement requests processed by the Treasurer as of June 23rd. It is anticipated that all line items will continue to be within budget at the end of FY2004. Lower than budgeted expenses are most noteworthy for the Secretary and the Membership Committee, reflecting initiatives undertaken after the August 2003 meeting to reduce the number of pages for Division mailings and to reduce postage costs for Division mailings and brochures.

The Executive Committee voted to accept the proposed budget of \$119,500 for FY2005. This budget is substantially lower than the budget for the previous year (i.e., a 13.6% decrease from the FY2004 budget). The FY2005 budget was achieved by trimming budgeted expenses for Elected Officers and Standing Committees (due to cost-cutting measures outlined

above), reducing budgeted expenses for the Newsletter (in anticipation of similar cost-cutting measures), and consolidating the committee structure, while largely preserving budgets for the Advisory Committees. This approach to the budget allows the Division to direct resources toward activities of direct benefit and importance to our members, yet still gradually replenish our reserves.

4. Report of Representatives to Council: The votes and proceedings from the most recent Council meeting did not include issues that would have a direct impact on Division 40. Council does remind divisions not to provide guidelines that could be construed as making suggestions or recommendations about the practice of psychology; any such documents must be approved by Council prior to dissemination. With the goal of maximizing the division's effectiveness in interacting with APA through our Council Representatives, the EC will be holding a special session during this APA Convention to provide EC members and committee chairs with information about the schedules and procedures by which APA Council operates. Drs. Paul Craig and Ken Adams will coordinate this session.

5. Membership: Dr. Bradley Axelrod reported that, as of June 1, 2004, the Division gained 108 new Members and 122 new Affiliates (121 Students, 1 International) during the current year. Our current membership statistics (both paid and unpaid) include: 98 Fellows, 3573 Members, 92 Associates, and 634 Affiliates. The total number of individuals associated with Division 40 is 4707.

The two Division 40 brochures, Pediatric Neuropsychology and Clinical Neuropsychology, are now available in printed form at a price that is at cost, as well as in PDF format as a free download from our website.

6. Elections: Dr. Antonio Puente submitted a report on the outcome of the recent election of officers. Congratulations to the following individuals: Dr. Russell Bauer will be the new President-Elect (effective 8/2004), Dr. Jennifer Manly Member-at-Large (effective 8/2004), and Drs. Kenneth Adams, Eileen Fennell, Jerry Sweet and Barbara Wilson Representatives to Council (effective 1/2005).

7. Fellows: Dr. Eileen Fennell, Chair of the Fellows Committee, offered her congratulations to the following individuals who were recently made Fellows: Drs. Jennifer Manly, Kimberly Espy, Paul Moberg, Doug Johnson-Greene, Lee Matthews and Janet Matthews.

8. Program Committee Report: Drs. Robert Elliott and Kimberly Espy reported on the scientific program. They expressed their thanks to the other members of the 2003-04 program committee (Drs. Greg Lee, Sean Rourke, Joanne Hamilton, Julie Bobholz, Tanis Ferman, Cheryl Luis, Lisa Barnes Young, Karen Mason, Jacobus Donders, Jane Cerhan, Tresa Roebuck, Philip Fastenau, Lisa Ravdin, Bradley Sewick, Edward Peck, Glenn Curtiss, Tony Wong, Maria Schultheis,

David Tulskey, and Thomas Bennett) and to Dr. Laura Julian for administrative assistance. Most of the Division 40 program is approved for APA credit. The Social Hour will again be held jointly with Division 22, and is sponsored this year by Harcourt Assessment, Inc. and by the Psychological Assessment Resources. The Arthur Benton award will go to Dr. Edith Kaplan and the Early Career Award to Dr. Agnes Chan. Plans are underway for the 2005 Convention, which will be held in Washington, D.C. Dr. Kimberly Espy will serve as Program Chair and Dr. Jacobus Donders as Co-Chair.

On behalf of the Executive Committee and the membership, Dr. Haaland thanked Drs. Elliott and Espy for their exemplary work in composing an outstanding scientific program for 2004.

9. Practice Advisory Committee Report: Dr. Neil Pliskin reported on the activities of the PAC. Technician Issue: The issue of legislation to limit the use of technicians in assessment continues to be a primary focus in the PAC. Dr. Pliskin reported that the APA Practice Organization has been strongly supportive of this practice concern and has recently completed a review of technician-related laws in all 50 states. Particular emphasis during the EC discussion was placed on current activity in New York (where Dr. Pliskin has been working closely with the Practice Directorate and with NYSPA), Arkansas (where use of technicians was recently reaffirmed, due in part to strong support of the Practice Organization which included a grant to offset legal costs), Oregon (where an amendment was passed that permits the use of technicians), and Tennessee (where regulations have been drafted that would prohibit the use of technicians). The Executive Committee discussed ways that the Division can be effective in working toward ensuring that it is permissible to utilize appropriately trained and supervised technicians. The PAC will plan, among other strategies, to continue to work closely with ASPPB in order to educate licensing boards about the importance of this issue and to provide accurate information about the competent use of technicians.

The Executive Committee considered a request that Dr. Pliskin received for Division 40 to support a national movement towards certification or registration for technicians. It was decided that it would be outside the charge of the Division to be actively involved in developing guidelines for professionals who are not clinical neuropsychologists, although the PAC is willing to provide any information that is requested relevant to the appropriate supervision of technicians by neuropsychologists.

The PAC has drafted a fact sheet describing the proper and improper uses of test technicians, re-emphasizing the established findings of Division 40's 1989 Taskforce on Education, Accreditation and Credentialing and offering specific examples of ethical practice. It is anticipated that this document will be ready for EC review in the fall.

At the urging of the PAC, APA has been working actively with

CMS to request that they expand the diagnostic testing rule to allow psychologists to supervise others. At the request of the APA Practice Organization, the PAC sent a detailed memo to Diane Pedulla that outlined the Division 40 perspective on this matter. Dr. Randy Phelps reported at the EC meeting that CMS has now decided in favor of a rule, effective January 2005, that will allow psychologists to serve as supervisors. Dr. Phelps thanked Dr. Pliskin and the Division for assistance in negotiating this important ruling change, and Dr. Haaland expressed her thanks to the Practice Organization for its outstanding efforts in support of technician issues.

#### Other Committee Activities:

The PAC and Science Advisory Committee have convened a taskforce seeking to establish a consensus statement on the role of clinical neuropsychology when cognitive testing is utilized in the context of clinical fMRI procedures, as has been the practice at a number of medical centers across the country. This statement is timely, as plans are underway within AMA and AAN to develop a CPT code and RVUs for these procedures. Members of the task force include: Drs. Julie Bobholz (chair), Bob Bilder, Susan Bookheimer, Michael Cole, Allan Mrksy, Neil Pliskin, Steve Rao, Joe Ricker, Andrew Saykin, John Sweeney, and Mike Westerveld. The EC voted to accept the draft document with minor revisions, and gave Dr. Pliskin approval to submit this manuscript for publication in *The Clinical Neuropsychologist*. The EC also approved a request from the task force to write a second document describing core competencies and training standards for neuropsychologists interested in doing clinical fMRI.

Over the past six months, the CPT Subcommittee (Dr. Antonio Puente, chair) has been actively working with APA staff to support the assignment of professional work values for psychological and neuropsychological testing through the AMA's coding and reimbursement committee process.

Dr. Pliskin reported on developments within the APA Committee for the Advancement of Professional Psychology (CAPP). APA has been working actively to support prescription privileges for psychologists and to support mental health parity legislation in Congress. The APA Practice Directorate emphasizes that it is vital for psychologists to use the new health and behavior CPT codes and encourages members to contact their office if they are having difficulty with reimbursement from specific insurance companies for these codes.

Drs. Ida Sue Baron and Josette Harris represent Division 40 in the Integration Group. Dr. Harris summarized the Division's activities around the use of technicians in the most recent meeting of this group.

Dr. Pliskin reported in his role as Federal Advocacy Coordinator that work has been coordinated closely with CAPP and has consisted of grassroots and Division 40 listserv activity related to parity legislation.

On behalf of the EC, Dr. Haaland thanked Dr. Pliskin for his extraordinary work this year on behalf of the Division.

10. APA Relations: Dr. Paul Craig led a discussion of potential ways to encourage a strong relationships with ASPPB. Dr. Craig will step down as Chair of APA Relations Committee at the close of Convention, and the new chair will be Dr. Gordon Chelune. Dr. Haaland thanked Dr. Craig for his excellent work as Chair.

11. Conflict of Interest Task Committee: Dr. Keith Yeates presented a draft Conflict of Interest policy for consideration by the Executive Committee. Minor modifications of the policy were discussed. Dr. Yeates will revise the document and present it to the Executive Committee, with a plan to vote on the acceptance of the policy via e-mail. If the policy is accepted by the EC, implementation will require that a bylaws amendment be approved by a vote of the general membership.

12. Publications and Communications. Dr. Bauer reported that the last several issues of the Division 40 Newsletter are among the most popular content on the Division 40 website, with almost 7800 hits on the June 2003 edition and over 5800 hits on the January 2003 edition. The June 2004 edition represents the last under the outstanding editorship of Dr. Joel Morgan. Drs. Bauer and Haaland expressed their deep appreciation to Dr. Joel Morgan, who has done an extraordinary job as Newsletter Editor and is responsible for shaping the Newsletter into a valuable and informative publication. Beginning with Volume 23, the Newsletter will be edited by Dr. Nancy Chiaravalloti, who has served as Associate Editor under Dr. Morgan. As we change Newsletter editors, it will be important to review the nature and purpose of the Newsletter and to solicit broad input into how the Newsletter can best serve the interests and membership of the Division. Dr. Haaland will convene a task force to provide such a review and to make recommendations to Dr. Chiaravalloti.

The website continues to be developed and maintained by Mr. Michael Cole, a graduate student at the University of Florida. Mr. Cole has done an outstanding job, and the committee is seeking an equally well qualified person to take over his role now that he will be starting his internship. The website has been entirely reorganized, many new links have been added, and pages are now dedicated to each of the Division's committees. Website hits for major informational pages are up 30% from a year ago, with an average of 1,381 hits per day over the past year. Updating the Training Programs section of the web will be an area of particular emphasis in the coming months.

No activity has occurred on the Division 40 Archives since the last meeting.

13. Public Interest Advisory Committee: Dr. Deborah Koltai Attix (chair) reported on the activities of the PIAC. The

consumer brochures are currently being translated into French and Hebrew, and English version are now available in .pdf form on the division website as well as in a printed version from APA Division Services. There is a target date of February 2005 for completion of the PIAC area of the Division 40 website. Dr. Attix continues to serve in the role of liaison to the Board for the Advancement of Psychology in the Public Interest (BAPPI), and she and several committee liaisons and monitors attended the spring APA Consolidated Meetings. She monitors correspondence from the Practice Directorate on the Public Education Campaign.

Co-Liaisons, Committee on Ethnic Minority Affairs (CEMA); Co-Chairs, Div40 EMA Subcommittee, Drs. Monica Rivera-Mindt and Tony Wong. The steering committee met at the International Neuropsychological Society's annual meeting to discuss plans for the coming year, and a highly successful mentoring session was also held at INS, with approximately 75 mentors and mentees as well as representatives from NIH who answered questions about funding mechanisms designed to encourage research from ethnic minority investigators. A conversation hour will be held at the APA Convention, entitled "Symptom Validity Tests and Ethnic Minority Issues." The steering committee was awarded a CEMRRAT (Committee on Ethnic Minority Recruitment, Retention, and Training in Psychology) grant, focussing on a program to promote recruitment and retention of potential ethnic minority neuropsychologists. They are currently working on implementing the initial phases of the grant goals, i.e., developing and disseminating surveys to directors of clinical training, current and prospective neuropsychology graduate students and EMA listserv members. EMA will be submitting a symposium proposal to the APA Multicultural Summit. Dr. Wong attended the APA Consolidated Meetings and worked with CEMA to review / provide input on a draft bibliography of literature on cross-cultural testing and assessment as well as to discuss ideas about the recruitment and retention of ethnic minority psychologists.

Liaison, Children, Youth and Families (CYF) Committee, Gerry Gioia, Ph.D. Dr. Gioia continues to monitor the Individuals with Disabilities Education (IDEA) reauthorization process in collaboration with School Psychology colleagues. Discussions have continued with a focus group of pediatric neuropsychologists, who have earlier training in school psychology, related to common or conflicting practice issues between Pediatric Neuropsychology and School Psychology. There continues to be no significant activity associated with the monitoring of the APA Working Group on Children's Mental Health (WGCMH). Early Mental Health Interventions Working Group (EMHI), or Juvenile Justice system.

Monitor, Committee on Disability Issues in Psychology (CDIP), Doug Johnson-Greene, Ph.D.: Dr. Johnson-Greene continues to monitor CDIP. Dr. Johnson-Greene recently forwarded (co-signed by Dr. Haaland) a letter to CDIP highlighting our interest in working with them on matters of

mutual interest, and as a result was asked to attend the CDIP spring consolidated meeting. There is a particular focus right now in this committee on making test manuals available for psychology students with visual impairments. The Executive Committee was supportive of the Division participating in efforts to make these materials available.

Chair, Ethics Subcommittee, Michele Macartney-Filgate, Ph.D. The Ethics Subcommittee is hosting a panel discussion at the APA Convention on the issue of release of test data to non-psychologists. Several papers on ethical issues are in preparation by committee members, and a list of ethics references is being compiled. A survey has been compiled of ethics committees in other divisions.

Chair, subcommittee, Committee on Women in Psychology (CWP), Cynthia Kubu, Ph.D. The Steering Committee for the Women in Neuropsychology (WIN) Interest Group met during the 2004 International Neuropsychological Society meeting to plan for the next six months. There will be an emphasis in the coming months on recruiting more senior women to the group as well as learning how WIN can best provide resources that are helpful to more senior women, in addition to the junior colleagues who have been the focus of many past WIN activities. WIN disseminated information to women about offices coming open within the Division, and provided listserv members with the names of individuals interested in being nominated for office. The committee also provided information to women seeking to apply for Fellow status in the division. WIN continues to offer a listserv that is provided by APA at no cost to the Division. The listserv currently has 334 members. WIN sponsored a panel discussion at the INS meeting that focused on strategies to combat harassment in training and work settings.

Monitor, APA Office on AIDS, Scott Hunter, Ph.D.: Dr. Hunter continues to monitor the APA Office on AIDS (COPA). The Behavioral and Social Science Volunteer (BSSV) Program is funded by the Centers for Disease Control and Prevention through a subcontract with the Academy for Educational Development, to establish a national network of behavioral and social science volunteers to assist with HIV prevention efforts in their communities. Interested neuropsychologists may call 202-218-3993 for more information. The HIV Office for Psychology Education (HOPE) Program utilizes a train-the-trainer model to educate mental health providers about working with people living with or affected by HIV/AIDS. People who want to learn more about this program may want to register for a 4 CE credit online course at [www.apa.org](http://www.apa.org).

Deborah Cahn-Weiner, Ph.D. has been monitoring activity in the APA Committee on Aging. Bernice Marcipolos, Ph.D. serves as liaison to the APA Committee on Rural Health (CRH), and attended CRH meetings at the APA Consolidated Meeting. Of particular note to Division 40, the committee is working a series of informatics-oriented initiatives to bring neuropsychological and TBI rehabilitation services to rural

communities. Dr. Scott Hunter continues to monitor the Committee on Urban Initiatives (CUI) and reports no changes since the last report. No reports are available from the Monitor of the APA Committee on Lesbian, Gay, & Bisexual Concerns (Randy Georgemiller, Ph.D) or the Liaison to the APA Committee on International Relations in Psychology (Alfred Ardila, Ph.D).

14. Education Advisory: Dr. Sandra Koffler (Chair) reported that the EAC is working to update the list of doctoral, internship and postdoctoral level training programs in neuropsychology. The Executive Committee recommended sending notices to the CUDCP (graduate program directors), APPIC (internship directors) and COGDOP (Psychology department heads) listservs to request updated listings from programs.

The EAC sponsored a highly successful career development session at the International Neuropsychological Society meeting, with a focus on sports psychology. The next session at INS 2005 will be about careers in the pharmaceutical industry.

The Executive Committee discussed the role of the student organization ANST within the Division. A conference call was planned to further discuss the articulation between ANST and the Executive Committee.

Dr. Haaland thanked Dr. Koffler for her excellent work as chair of the EAC. Dr. Douglas Ris will be beginning his term as chair beginning after the APA Convention.

15. Science Advisory: The SAC is chaired by Dr. Allan Mirsky, who has been in contact with the Dr. Patricia Kabor at the APA Science Directorate to clarify the most effective ways for the division to work collaboratively on the APA science agenda. Several potential collaborative initiatives were identified. In addition, the SAC has prepared a list of psychologists who are qualified to serve on the Institute Advisory Councils for various NIH Institutes that do not currently have psychologists as committee members, and has forwarded this list to APA.

There was a discussion with Drs. Holt and Kabor about ways in which the Division can be of service to the APA Science Directorate.

16. Dr. Haaland adjourned the meeting at 10:40 AM.

Respectfully submitted,

Paula K. Shear, Ph.D.  
Secretary, APA Division 40

## Newsletter

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Newsletter 40 is the official publication of Division 40. The Editor is Nancy Chiaravalloti. Dr. Chiaravalloti's address is: Neuropsychology Laboratory, Kessler Medical Research Rehabilitation and Education Corporation, 1199 Pleasant Valley Way, West Orange, NJ 07052. Email: [nchiaravalloti@kmrrec.org](mailto:nchiaravalloti@kmrrec.org). Division 40's Website is: [www.div40.org](http://www.div40.org). Webmaster is Dr. Lloyd Cripe.

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