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Identification of Malingered Head Injury on the Halstead-Reitan Battery

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Heaton et al. (1978) demonstrated that the performance of malingerers and actual head trauma patients could be distinguished on the HRB by discriminant analysis. The present study replicated Heaton et al.'s methodology on a larger sample to provide a more stable function for discriminating simulated and real head trauma. Malingerers (n = 80) were instructed to fake severe deficits without being obvious. Patients (n = 80) had documented trauma and were not litigating for compensation. Groups were matched on age, gender, and overall Impairment Index to permit comparisons between patterns of performance. A crossvalidated step-wise discriminant function correctly identified 88.75% of the groups, with 83.8% true positives and 93.8% true negatives. This function was applied to several published data sets. Both malingerer and patient groups were accurately identified in Heaton et al. (1978) and Trueblood and Schmidt (1993). Faust et al.'s (1988) adolescent malingerer and the malingered performance of three litigating patients published by Cullum et al. (1991), were also correctly classified.

The Halstead-Reitan Battery (HRB) is the neuropsychological test battery most often used to identify cerebral damage or disease (Guilmette, Faust, Hart, & Arkes, 1990; Sellers & Nadler, 1992), and ample normative data bases are available for this purpose (Heaton, Grant, & Matthews, 1991; Russell & Starkey, 1993; Wolfson & Reitan, 1995). Conclusions based on the HRB become important in the evidentiary process when head trauma is sustained in a context where liability is an issue, or when criminal responsibility is questioned. Patients who are examined under these circumstances have substantial incentives to perform poorly, and some undoubtedly simulate impairments that are not, in fact, present. The question of whether impairments are real or simulated, therefore, becomes an important one in legal settings.

Heaton, Smith, Lehman, and Vogt (1978) demonstrated that the HRB performance of malingerers could be distinguished from that of nonlitigating head trauma patients by their significantly poorer performance on the Speech-Sounds Perception and Finger Tapping

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tests, finger agnosia, sensory suppressions, and grip strength. The real head injury group did significantly worse than the simulators on the Tactual Performance and Category tests. Groups did not differ in their overall level of impairment as measured by the Impairment Index. A discriminant function analysis that included the HRB subtests yielded a high rate of classification accuracy, but failed to crossvalidate due to the unfavorable subject to variable ratio (Thompson & Cullum, 1991).

Trueblood and Schmidt (1993) found that malingerers performed more poorly than did nonmalingerers on the Speech Sounds Perception and Seashore Rhythm tests, finger tip number writing, and finger agnosia. Similarly, Binder and Willis (1991) reported that malingerers were more impaired than a nonmalingerers head injured group on finger agnosia, finger tip number writing, finger tapping, and sensory suppressions. However, the applicability of these results to individual cases may be limited because groups differed in overall level of impairment and sample sizes were relatively small.

In summary, previous studies suggest that impaired levels of performance on the HRB can be produced by individuals who attempt to simulate head injury symptoms with relatively little difficulty. These apparent impairments may be more pronounced than those actually caused by head trauma (Binder & Willis, 1991; Trueblood & Schmidt, 1993). One potential indication of malingering is an inconsistency between the severity of injury and the severity of impairment (Larrabee, 1990; Trueblood, 1994). However, it can be difficult to accurately determine injury severity from medical records or to precisely predict the expected level of subsequent cognitive impairment. The HRB is often administered for just this purpose.

Malingerers may often be able to simulate realistic levels of impairment that cannot be discriminated from those produced by head trauma (Heaton et al., 1978). However, previous studies suggest that simulated and actual impairment due to concussion can be distinguished by HRB performance pattern. The quantitative characteristics of this performance pattern vary somewhat across studies, possibly due to limited sample sizes and differences in overall impairment levels. The present objective was therefore to replicate Heaton et al.'s (1978) methodology on a larger sample in order to provide a more stable algorithm for discriminating simulated and real head trauma. Groups were matched on Impairment Index in order to remove variability due to overall level of performance and to permit differences in the pattern of performance to emerge. This procedure was expected to produce discriminations that were independent of impairment level and that would, therefore, have the potential to generalize across a range of overall score severity levels.

Nonlitigating head-injured patients were compared to age and gender matched subjects who were instructed to malingering head trauma symptoms on the HRB to determine if these methods would produce viable discriminations. The resulting decision rules were then applied to malingering patients. A simpler and intuitively appealing alternative approach would have been to derive the initial discriminating procedures directly from a comparison between malingering and head-injured patients. However, there are a variety of methodological difficulties with this alternative. Few patients admit to have malingered in clinical practice. As noted above, marked discrepancies between test performance and injury severity can provide one indication of invalid performance. However, patients identified in this way represent a problematic criterion group because the discrepancy may have been due to inaccurate clinical impressions about injury severity, patient disinterest, fatigue, pain, anxiety, or depression rather than malingering (Binder, 1990; Snow, Tierney, Zorzitto, Fisher, & Reid, 1990). Previously validated techniques can be used to identify a malingering patient group. However, such a criterion group would likely be contaminated by a percentage of patients with genuine impairment that is proportional to the false positive rate of the methods. When the base rate of malingering in the clinical sample from which these patients

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