Reviewer's report

Title: Hyperactivity Persists In Male and Female Adults with ADHD and Remains a Highly Discriminative Feature of the Disorder: A Case-Control Study

Version: 1 Date: 19 March 2012

Reviewer: Carroll W. Hughes

Reviewer's report:

A very well done article and significant contribution to the literature. An important aspect in addition to demonstrating the subtle movement that continues into adult ADHD, is the comparison to the traditional Conner’s CPT which remains the norm, but w/o any means for monitoring the important movements. Clearly the Quotient device adds a magnitude of detection that has been missing for assessing this very common, often, undiagnosed or missed adult disorder.

Problems in downloading the manuscript? On two different occasions the pdf generated the document with Results following Background then Discussion with last section Method. I was able to put it together, but pages and lines also not numbered so hard to refer to specific sentences (suspect a system uploading problem) where just a few typos were found, or an awkward sentence where a word appears to be missing.

Introduction: No problems, informative and succinct. States the problem and sets rationale well.

Method:

The Wender Utah Interview needs to be described and referenced and rationale for its choice. It is not as commonly used as other interviews (e.g., SCID).

Tested twice per visit? Order of testing for the 4 attention tasks is randomized and important; but then two left out? Please elaborate on the rationale for the choice of the No-4’s cognitive control test as opposed to the other Quotient tasks available? How do the different tasks differ from each other and how does it match up with Conner’s CPT-II? Was this an a priori decision? That isn’t clear. It also sounds like 3 types of tests were administered and No-4 chosen to compare to CPT-II. Why the other two test data aren’t presented is not elaborated upon. Should the statement where the decision to only compare the two is stated, be closer to the statistical analyses?

Does anything need to be said about foot movement measures since not used or valid apparently?

Good definition of the various measures. But consider elaborating on derivation of “discriminative index” for Quotient, and “confidence index” for CPT-II and how they are, or are not related.

Data analysis: Is arguing, related to activity, that less significant or less able to discriminate, a variant of arguing to prove the “null hypothesis”?
Statistics are well described and elaborated upon in text. I like the use of various models to describe the findings and believe that clearly strengthens the argument for importance of movement. Table 5 seems to be somewhat of an overkill, but I guess it sure addresses statistician’s concerned or who argue for certain models. They’re all there and basically support similar findings. Suspect some readers may be less familiar with the various Forest regressions or use of their statistical packages (documentation is good however). Might comment on that for the SAS/SPPS/S-Plus users; i.e., why it was chosen.

Some might question why not test significance of age difference in demographics? Doesn’t matter to me – they’re close enough with SD reported. And inclusion as a covariate in the various models also supported that it was not a significant factor (important finding in itself).

Results: Very well presented and thoroughly analyzed.

Data and analyses related to Figures and Tables:

Is Figure 1 based on the best representative of an ADHD male and female and Control the best representative of a normal male and female? OR better, is it possible to create an overall composite? Some will always argue that the most representative was selected. In figure 2 it was hard (w/o color) to know with certainty which line went with which group – consider dotted, hashed, etc for black and white -- might consider adding median cut-point.

Figure 3, not sure that all of the variables/measures are adequately defined anywhere. Or an explanation of why some repeat with this particular analysis (e.g., errors of commission, spatial complexity on mean decrease accuracy and mean decrease Gini)?

Tables 1, 2 and 3 can be shortened with footnote of no significant effects of gender or age covariates using q-values and eliminating those columns of statistics. Likewise in text with a simple statement to the effect that age and gender were not significant covariates.

Importance of Table 4? Please elaborate rationale and more written on significance of the findings.

Discussion: Any comments about the impact of CPT ISI, position of stimulus, percent trials with stimulus, and type of stimulus (figure vs. letter) on why this might make a difference in any of the results? Or is it safe to argue that this doesn’t matter given the activity findings. What about the neurobiology of figures vs. letters and how that might affect performance? Could they include a little more on the neurobiological basis of the activity from their earlier work that readers may not be familiar with or have access to?

**Level of interest:** An exceptional article

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.
Declaration of competing interests:

I have been funded by the NIMH for research. Otherwise none, except see above.