

Letter to the Editor

A Response to “The Mystery of Unexplained Variance—Some Comments on Brennehan et al (2017)”

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In a recent reply to our article, Brennehan et al (2017), McFarland raised several issues regarding our statistical design and findings, some of which we will address briefly here. We reported the coefficient of determination, r^2 , a commonly used effect size statistic that describes the degree of shared variance between variables, and the raw correlation coefficients on which the r^2 values were based. Using these correlation coefficients, McFarland argued that the relationship we reported between some of our central auditory processing disorder (CAPD) measures and cognition measures may actually be quite large when considered in the context of reliability data from another study (Musiek et al, 1991), which McFarland used to determine the expected upper limit of shared variance. However, if one considers other reliability data, such as those reported by Strouse and Hall (1995), then the degree of shared variance between CAPD and cognition in the present study appears quite modest, as we reported.

McFarland incorrectly assumed that our goal was to address “whether CAPD tests provide incremental validity beyond that provided by language and cognitive tests....” and argued that our statistical approach was inadequate to pursue that goal. In fact, establishing incremental validity was not our goal. As stated in the introduction, we set out to examine to what degree clinical measures of CAPD, language, and cognition shared variance in a population that has a high comorbidity rate for auditory processing, speech-language, and cognitive deficits. Given this high comorbidity rate, we chose to examine the relationship between pairs of tests rather than taking a regression approach in which multicollinearity of the predictors could potentially be an issue.

McFarland’s comments obscure two important implications of our findings. First, the largest correlation and r^2 value in our data were between the cognition and speech-language tests. If one criterion required to establish CAPD tests as independent measures is how

well they disassociate from other measures, then, clearly, our results suggest that CAPD is more independent from speech-language and cognition than speech-language and cognition measures are from each other. Second, the present study showed that significant relationships between CAPD tests and other measures were more likely observed if participants with lower cognition were included. For this reason, we emphasized the importance of clearly defining participants in future studies investigating CAPD in pediatric populations relative to potential confounding variables and/or comorbid cognitive and speech-language deficits, something that currently is rarely done.

In his closing, McFarland advocates for the use of multi-modality testing in the diagnosis of auditory processing deficits. Limitations regarding this approach have been raised frequently in the literature (Musiek et al, 2005; Dillon et al, 2014; Moore and Ferguson, 2014). We would refer the interested reader to these existing publications for discussion of this approach.

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