Comparing alternative diagnostic criteria sets using Item Response Theory (IRT)

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Item Response Theory (IRT)

IRT models are useful for assessing the ability of criterion sets to measure underlying psychiatric disorders, e.g. substance use disorders. IRT assumes the underlying psychiatric disorder is inherently continuous ranging from low to high severity and estimates different points along that continuum. The 2-parameter IRT model is commonly used and describes each of the diagnostic criteria in terms of its discrimination (slope) and severity (location) for measuring the underlying disorder.

Nictine Use Disorder

We illustrate IRT with an application to Nicotine Use Disorder. With the changes proposed for the other DSM-5 SUDs to combine dependence and abuse criteria along with cravings into a single disorder, we examined whether combining nicotine dependence, abuse, and cravings criteria is warranted.

Can the measurement of nicotine use disorder be improved by adding nicotine abuse and cravings criterion to existing nicotine dependence criterion?

IRT Total Information Curves

The total information curve (TIC) summarizes the combination of all the criterion and provides a visual inspection of where along the disorder continuum the criteria measure the disorder well (i.e. with more precision).

IRT Total Information Area Index

By integrating the total information curve we can obtain a single number summary called the Total Information Area (TIA) Index. A larger TIA index indicates the criteria set provides more information about the disorder.

Conclusions

Adding abuse criteria to the dependence criteria significantly increased the TIA and thus improves measurement of the disorder. The TIA is not further significantly improved by incorporating craving.

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For further information

About IRT Total Information: http://www.columbia.edu/~mmw2177/irtprog.html