

as an alternative to the written version for assessing set shifting abilities. These findings are limited to patients with movement disorders, and future research with diverse patient populations could help determine whether O-TMT can be generalized to other patient groups. Additionally, future research should examine whether O-TMT scores obtained via virtual testing correspond with W-TMT scores obtained in-person.

**Categories:** Movement and Movement Disorders

**Keyword 1:** Parkinson's disease

**Keyword 2:** psychometrics

**Keyword 3:** executive functions

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## 20 Laterality of Motor Symptom Onset is Not Associated with Cognitive Performance or Mood Symptoms in a Sample of 600 Individuals with Idiopathic Parkinson's Disease"

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**Objective:** Parkinson's disease (PD) is typically characterized by unilateral onset of motor symptoms (i.e., tremors, rigidity) which is caused by dopaminergic degeneration of the substantia nigra that influences basal ganglia-prefrontal circuitry. Over time, motor symptoms become more bilateral, though continue to remain asymmetric. Many neuropsychological studies suggest that laterality of motor onset may be linked to hemispheric specific cognitive or mood changes. Namely, worse verbal/language performance may be present in individuals with right body (left hemisphere) onset and conversely for visuospatial performance, with depression symptoms relating more so to individuals with right body (left hemisphere) onset. To date, findings are often inconsistent, with some studies showing evidence for laterality effects and others not. The basis for this inconsistency is unclear, though one

possibility relates to small sample sizes and varying methodologies. Thus, the goal of this study was to examine potential cognitive and mood laterality effects in a large clinical sample of individuals with PD.

**Participants and Methods:** Participants included a convenience sample of 600 nondemented individuals with idiopathic PD from the University of Florida Fixel Institute Movement Disorders Center. As a group, participants were around 60 years of age (Mean Age=63.9+9.4), well educated (Mean years=14.9+2.7), predominantly male (70%), and white non-Hispanic (93%). Side of initial motor symptom onset was based on self-report: Right (N=337) and Left (N=263). Approximately 79% were tremor predominant. All received mood and neurocognitive measures as part of standard clinical care, including indices of executive function (Stroop Color-Word, Trails B, Letter Fluency), recent verbal memory (delayed recall: Hopkin's Verbal Learning Test, WMS-III Logical Memory), language (Boston Naming Test, Animal fluency), visuospatial skills (Judgment of Line Orientation, Facial Recognition Test). Evaluation of emotion symptoms included: depression (Beck Depression Inventory-II), apathy (Apathy Scale), and anxiety (State-Trait Anxiety Inventory). Analyses used raw scores from these measures. Due to non-normality of most measures' distributions, laterality effects were examined using bootstrapped multivariate methods (multivariate analysis of variance [MANOVA]). Separate MANOVA's were run for each cognitive domain (i.e., EF, language, etc.) and mood measures.

**Results:** The right and left sided onset groups did not significantly differ in demographic (age, education, sex) or disease characteristics (duration, PD subtype). Results of the MANOVA's with cognitive variables were all nonsignificant broadly (all with F's ranging from .33 to .94) and at the single test level. Similarly, the left and right onset groups did not significantly differ ( $\alpha=0.05$ ) across standard scales of depression ( $F=0.031$ ), anxiety (Trait  $F=0.463$ ; State  $F=3.29$ ), and apathy ( $F=0.74$ ).

**Conclusions:** We found no evidence that laterality of initial motor symptoms influenced cognitive or mood symptoms in a large cohort of 600 individuals with PD. These findings raise questions about importance of motor onset laterality for cognitive and emotion related changes in PD. Future studies should move beyond self-report and behavioral motor scales

for determining hemispheric contributions. In PD, use of refined metrics for determining the extent of asymmetric dopaminergic degeneration (e.g., DAT scan) at the hemispheric level coupled with sensitive neuropsychological measures may provide clearer understanding of potential neural circuitry relationships.

**Categories:** Movement and Movement Disorders

**Keyword 1:** Parkinson's disease

**Keyword 2:** laterality

**Keyword 3:** cognitive functioning

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## 21 Exploratory Factor Analysis of the Cognitive Change Index-20 in Individuals with Parkinson disease or Essential Tremor

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**Objective:** Subjective cognitive complaints are common in individuals with Parkinson's disease and Essential Tremor. One scale often used to capture the type and severity of subjective cognitive concerns is the Cognitive Change Index-20 (CCI-20). Created by Saykin et al (2006), the CCI-20 is a questionnaire that assesses perception of cognitive changes in memory, executive function, and language domains. Despite its multidomain structure, previous research has not empirically examined whether the CCI-20's underlying factor structure aligns with the cognitive domains proposed during its original development. Thus, the goal of the current study was to investigate the factor structure of the CCI-20 in individuals with movement disorders (Parkinson's disease, Essential Tremor) who are known to experience varying degrees of cognitive sequelae as part of their disease progression.

**Participants and Methods:** Participants included a convenience sample of 216 non-demented individuals with Parkinson disease (n=149) or Essential Tremor (n=67) who were seen at the University of Florida Fixel Institute Movement Disorders Center. All received the

CCI-20 as part of a neuropsychological evaluation. The CCI-20 consists of 20 items, rated on a 5-point Likert scale, that ask questions about change in memory (12 items), executive function (5 items), and language (3 items) over the past 5 years. An exploratory factor analysis was conducted on CCI-20 scores using Promax rotation with factor extraction based on scree plot visual inspection and Kaiser's rule (eigenvalues >1.0). Cronbach's alpha was used to assess internal consistency reliability. Finally, Spearman correlations determined associations between factors and mood measures of depression (Beck Depression Inventory-II, BDI-II), apathy (Apathy Scale, AS), and anxiety (State-Trait Anxiety Inventory, STAI).

**Results:** Because the Parkinson's disease and Essential Tremor groups did not statistically differ in their CCI-20 total scores, they were combined into a single group for analyses. This resulted in 216 participants who were well-educated (m=15.01±2.92), in their mid-60's (m=67.72±9.33), predominantly male (63%), and non-Hispanic White (93.6%). The factor analysis resulted in 3 factors: factor 1 included 8 memory items (items 1-4, 6, 10-12; loadings from .524 to .920); factor 2 included all executive and language (items 13-20; loadings from .605 to .824), and factor 3 included four remaining memory items (items 5, 7-9; loadings from .628 to .810). Reliability of the 20 CCI items was good ( $\alpha = .94$ ), and reliability within each factor ranged from adequate (Factor 3,  $\alpha = .78$ ) to good (Factors 1 and 2,  $\alpha = .90$ ). All factors showed significant weak to moderate associations with BDI-II, AS, and STAI (state and trait) scores.

**Conclusions:** The CCI-20 revealed three distinct dimensions of subjective cognitive complaints that did not correspond to the memory, executive function, and language domains. Rather, the CCI-20 was decomposed into two different dimensions of memory complaints and one dimension of non-memory complaints. Mood symptoms played a significant role in driving all dimensions of subjective cognitive complaints. Future studies should confirm this triadic structure in a healthy older adult sample and explore the relationship between factors and objective cognitive performance beyond the contribution of mood. T32-AG061892; T32-NS082168

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