

**Categories:** Visuospatial Functions/Neglect/Agnosia

**Keyword 1:** neurocognition

**Keyword 2:** neglect

**Keyword 3:** asymmetry

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#### 40 Disorders Of The Anterior Attentional-Intentional System In COVID-19 Survivors – Preliminary Results

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**Objective:** In December 2019, the first reports came from China about cases of pneumonia caused by a previously unknown coronavirus, SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), responsible for a disease called COVID-19. Since then, the pandemic has spread worldwide, affecting people's physical and mental health and as well as quality of life. Currently, many people are experiencing the health consequences of contracting COVID-19, also due to the impact this disease has on the central nervous system. As a result, in addition to well-known ailments, such as headaches, chronic fatigue or smell and taste disorders, COVID-19 survivors may develop neuropsychological problems such as executive-attentional deficits. However, the specificity of these executive-attentional problems has not been determined. Thus, the purpose of this study was to learn if survivors of COVID-19 may present with more generalized or rather specific dysfunction(s) of the anterior attentional-executive system.

**Participants and Methods:** The study group consisted of 37 individuals who underwent COVID-19 (age M=44, education M=17). The comparison group consisted of 25 matched controls tested before the COVID-19 pandemic. The experimental procedures included (1) a clinical interview, (2) an assessment of selected cognitive functions (3) and attentional-

executive functioning, which was assessed using the ROTman-Baycrest Battery to Investigate Attention (ROBBIA); a battery was designed to measure three attentional processes (i.e., energizing, task setting, and monitoring). Overall, four reaction time (RT) subtests from ROBBIA were administered: (1) Simple RT, (2) Choice RT, (3), Prepare RT, and (4) Concentrate. For each subtest, the instruction was to press an appropriate button on a response pad as quickly as possible when a target stimulus (one of the following capital letters: A, B, C, or D) is detected, but also (in Choice RT, Prepare RT and Concentrate) to make as few errors as possible.

**Results:** Overall, the analyses revealed that individuals who survived COVID-19 exhibited a different effect of the warning stimulus compared to controls. Specifically, COVID-19 survivors presented an increase in reaction time from 1s warning condition to 3s warning condition being significantly greater than the control group's increase ( $p < .05$ ). Also, only in the COVID-19 group, reaction time in the Concentrate task tended to be longer ( $p = 0.01$ ). No group differences in monitoring (e.g., number of errors) or task setting emerged.

**Conclusions:** The patients' problems appear analogous to those observed in other chronic somatic diseases, likely due to the impact of COVID-19 on the frontal lobe's medial regions. However, due to a small sample size, future neuroimaging research, including computerized studies of attentional-execution networks, is needed to confirm that COVID-19 may predominantly affect the energization system that contributes to these patient's cognitive slowing and defective ability to sustain attention.

**Categories:** Executive Functions/Frontal Lobes

**Keyword 1:** computerized neuropsychological testing

**Keyword 2:** frontal lobes

**Keyword 3:** reaction time

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#### 41 Concussion History, Physical Activity, and Athletic Status Predict Subjective but not Objective Executive Functioning

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**Objective:** Factors such as physical activity and sports participation may have a positive effect on executive functioning. However, people involved in sports are at a higher risk of experiencing a concussion, which may have a detrimental effect. Previous research has yet to investigate those combined negative and positive effects while also utilizing a comprehensive assessment of executive function. This study aims precisely to examine the effects of physical activity, athletic status and concussion history on subjective (e.g., questionnaire) and objective measures (e.g., latent variables) of three well-established components of executive function (i.e., inhibiting, shifting, and updating) in young adults.

**Participants and Methods:** 247 Canadian university students (ages 18 – 25; 83% female) completed a remote assessment of executive function involving nine computerized tasks and a behavioural self-report, in addition to demographic questionnaires and items assessing weekly physical activity, athletic status, and concussion history. A linear regression analysis was used to assess the effects of the predictor variables (age, sex, concussion history, physical activity and athletic status) on subjective reporting of executive functioning using the Executive Function Index. Furthermore, structural equation modelling (SEM) was used to predict objective executive function using a three-factor model (shifting, updating, inhibition).

**Results:** The three-factor measurement model of executive function fit the data adequately:  $\chi^2 = 26.10$ ,  $df = 17$ ,  $p = 0.07$ , CFI = 0.97, TLI = 0.95, RMSEA = 0.05 [90% CI: 0.00–0.09], SRMR = 0.04. Then, the three-factor SEM of executive function also fit the data adequately:  $\chi^2 = 66.38$ ,  $df = 51$ ,  $p = 0.07$ , CFI = 0.95, TLI = 0.93, RMSEA = 0.04 [90% CI: 0.00–0.06], SRMR = 0.05. Using SEM, no direct relationship was found between the factors of executive

function and the predictor variables (i.e., age, physical activity, concussion history, and athletic status). Sex was significantly related to inhibition ( $b = 0.52$ ,  $p = 0.02$ ), such that males had greater inhibition. For the regression, physical activity ( $b = 0.09$ ,  $p < .01$ ), concussion history ( $b = 3.29$ ,  $p < .05$ ) and athletic status ( $b = -4.01$ ,  $p < .05$ ) were found to be significant predictors for the Executive Function Index.

**Conclusions:** Concussion history, physical activity, and athletic status were all predictive of subjective but not objective measures of executive function. Interestingly, these findings align with previous research that demonstrated performance-based executive function measures often do not align with self-report measures, which may suggest they are complementary but measure slightly different aspects of the underlying executive function construct. Mixed findings in the extant literature regarding sex differences and executive function require continued research to understand better the relationship and mechanisms behind the sex differences in inhibition. In summary, these findings offer support for the differentiation between subjective and objective measures of executive function when investigating their relationship with physical activity, sport participation, concussion history, age and sex.

**Categories:** Executive Functions/Frontal Lobes

**Keyword 1:** concussion/ mild traumatic brain injury

**Keyword 2:** sports-related neuropsychology

**Keyword 3:** executive functions

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## 42 White matter injury is driven by HIV duration, immune and vascular factors in virally suppressed people living with HIV: a longitudinal diffusion imaging study

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