Social Competence and Decision Making

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Background

Previous research has demonstrated that the frontal lobes are most susceptible to damage during a traumatic brain injury (TBI). The prefrontal cortex (PFC), especially the orbitofrontal cortex is most susceptible to damage. The orbitofrontal cortex is responsible for analyzing and directing behaviour, especially with regards to moral behaviour. It has been established that extensive frontal lobe damage leads to significant disruption in the perception of moral behaviours, however, people who have incurred mild head injuries (MHI) show similar deficits to patients with TBI but to a lesser degree. The purpose of this study was to investigate social problem solving and moral behaviours in persons who have incurred mild head injuries.

Hypothesis 1:

University students who have experienced a subtle MHI will perceive themselves as equally competent problem solvers relative to the non-MHI group

Hypothesis 2:

When MHI group considers social/moral decisions, we expect their performance to reflect different processes such as MHI group will take less time to respond and be less affected by the personal moral dilemmas as compared to non-MHI group

Methods

Participants

Brock University Students ($N = 44$)

- 59 % ($n = 26$) reported at least one MHI
- 41 % ($n = 18$) reported no MHI

Methods and Procedure

Indicators of previous MHI - Self-reported experience of altered state of consciousness:

- Have you ever hit your head against a hard surface sufficient to alter your consciousness (i.e. loss of consciousness, vomiting, dizziness)?
- Did it result in a concussion?

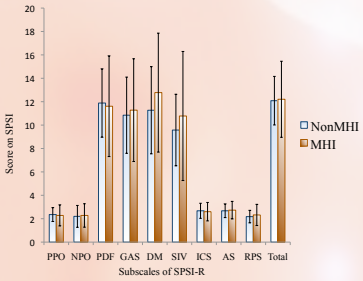
Measures of Social Problem Solving:

- Social Problem Solving Inventory (D'Zurilla, Nezu, & Maydeu-Olivares, 2002)
- Moral Judgment Task (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001)

Results

Hypothesis 1:

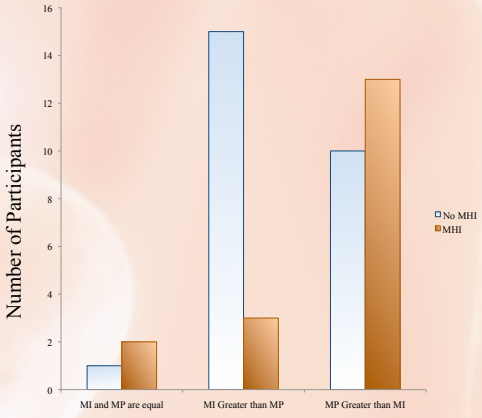
As predicted the MHI group reports themselves as equally competent social problem solvers on the Social Problem Solving Inventory-Revised (D'Zurilla, Nezu, & Maydeu-Olivares, 2002).



$F(1, 42) = 0.32, p = .57$

Hypothesis 2:

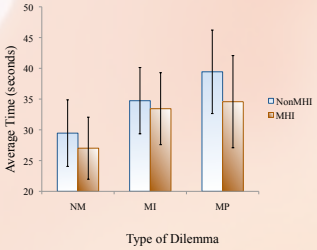
Despite that the MHI group did see themselves as better or worse they use their problem solving strategies differently relative to the non-MHI group, for example, the social moral decisions demonstrate this:



$\chi^2 = 7.54$, p = 0.02 $\chi^2 = 6.74, p = 0.009$

Hypothesis 2 cont.:

As the social situations become more complex, the non-MHI group takes more time to reflect before making their decision. However, the MHI group differentiates between non-moral and moral dilemmas but do not differ within the moral categories (for example moral impersonal and moral personal dilemmas).



$F(1,42) = 5.36, p = .03$

Discussion

In summary, the MHI group rated themselves as equally competent social problem solvers however, they use their problem solving strategies differently relative to the non-MHI group. The difference in decision making was demonstrated through the moral decision making task in which participants had to rate the likelihood of committing moral violations.

The MHI group took less time to respond and was less affected by the personal moral dilemmas as compared to non-MHI group.

The results provide support for the lack of top down modulation in persons with MHI. Orbitofrontal cortex disruption is a key factor that may contribute to this poor decision making. These results are consistent with other findings regarding the differences among social decisions between groups (Ciaramelli, Muccioli, La' davas, & Pellegrino, 2007)

Conclusion

Mild head injuries may be subtle, but have an impact on social decision making observed in a highly competent population. Investigating social and moral behaviors in persons with MHI sheds light on the way decisions are made.

References

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Greene, J.D., Sommerville, R.B., Nystrom, L.E., Darley, J.M., & Cohen, J.D. (2001). An fMRI investigation of emotional engagement in moral judgment. *SCIENCE, 293*, 2105-2108.

For original and complete testing materials (dilemmas), access: www.sciencemag.org/cgi/content/full/293/5537/2105/DC1