



Reducing Math Anxiety to Increase Recruitment: A Proposed Randomized Controlled Trial

Ben Sylvester¹, Colin Kemp¹, Steve Gooch², Justin Feeney³,

¹Director General Military Personnel Research and Analysis, Ottawa, Canada

²Assistant Deputy Minister (Data, Innovation, and Analytics), Ottawa, Canada

³Rhode Island College, Providence, United States of America

Join Zoom Meeting <https://us04web.zoom.us/j/2230192232?pwd=Nk9oaFN5TTVmVGJyalZZZ3JBUKlQZz09> Meeting ID: 223 019 2232 Passcode: 306747

Background

- Canadian Armed Forces (CAF), applicants undergo a cognitive ability test called the Canadian Forces Aptitude Test (CFAT)
- Applicants who score higher on the CFAT are eligible for more complex occupations
- Math anxiety may artificially lower scores for women (compared to men; Hart & Ganley, 2019) and stereotype threat may lower scores for people who identify with underrepresented groups (i.e., gender, visible minorities, Indigenous Peoples, and persons with disabilities; Cohen, & Sherman, 2014)
- To help level the playing field we need a cost-effective, easily implemented, standardized method

The purpose of the proposed study is twofold: 1) to assess whether mathematics anxiety is higher in women than men taking the Practice Canadian Forces Aptitude Test (PCFAT), and 2) to determine whether applicants' PCFAT scores can be increased through brief nudge interventions designed to mitigate mathematics anxiety.

Method

Participants will be randomized to one of five conditions and asked to complete demographic questions, a measure of math anxiety, and the PCFAT.

The five conditions include

1. Inoculation Message
2. Values Affirmation
3. Combined inoculation message + values affirmation
4. Control condition with no manipulation message or writing activity
5. Control condition with a writing activity to equalize factors like time, cognitive effort, and fatigue

Basis of Interventions

- Inoculation helps build resistance through protective responses, such as the production of refutations to arguments, triggered by threat (Compton, 2013)
- Messages developed using inoculation theory principles might help 'protect' test takers against the onset of anxiety, and against negative interpretations regarding the effects of anxiety
- A second approach stems from a basic need to maintain the integrity of the self (i.e., a global sense of personal adequacy; Cohen & Sherman, 2014)
- Events that threaten self-integrity arouse stress and self-protective defenses that can hamper performance
- Writing about core personal values can curb negative outcomes by stimulating a more expansive view of the self and its resources, weakening the implications of a threat for personal integrity

Results

A t-test and MANOVA will be used to examine gender and test score differences between conditions.

Discussion

As an organization that strives for employment equity, the CAF wants to recruit more women, visible minorities, Indigenous Peoples, and persons with disabilities. This analysis has the potential to raise CFAT test scores for any examinee who experiences anxiety, irrespective of the sub-group with which they identify.

References

- Cohen, G. L., & Sherman, D. K. (2014). The psychology of change: Self-affirmation and social psychological intervention. *Annual review of psychology*, 65.
- Compton, J. (2013). Inoculation theory. *The Sage handbook of persuasion: Developments in theory and practice*, 2, 220-237.
- Hart, S. A., & Ganley, C. M. (2019). The nature of math anxiety in adults: Prevalence and correlates. *Journal of Numerical Cognition*, 5(2), 122-139.