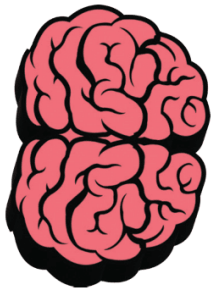
psynapse

ISSUE 006



ISSUE 006

psynapse

JOURNAL INFORMATION

This journal remains the property of Psynapse: McMaster Undergraduate Journal of Psychology, Neuroscience & Behaviour. Psynapse is a not-for-profit, student-run organization and makes no monetary gain from the production, publication, and distribution of this journal.

COPYRIGHT NOTICE

Authors who publish with this journal agree to the following terms:

I. Authors retain copyright and grant the journal right of first publication with the work simultaneously licensed under a Creative Commons Attribution License that allows others to share the work with an acknowledgement of the work's authorship and initial publication in this journal.

II. Authors are able to enter into separate, additional contractual arrangements for the non-exclusive distribution of the journal's published version of the work (e.g., post it to an institutional repository or publish it in a book), with an acknowledgement of its initial publication in this journal.

III. Authors are permitted and encouraged to post their work online (e.g., in institutional repositories or on their website) prior to and during the submission process, as it can lead to productive exchanges, as well as earlier and greater citation of published work.

PARTNERS

McMaster Science Society

McMaster Psychology, Neuroscience & Behaviour Society

BioPsych Society

McMaster Libraries & Collections

McMaster Student Union

MSU Clubs Executive Council

ADDRESS

Psychology Complex (PC)

Building 34, Room 102

1280 Main Street West, Hamilton, Ontario L8S 4K1

CONTACTS

Email | Facebook | Website

Psynapse McMaster Undergraduate Journal of Psychology, Neuroscience & Behaviour

EXECUTIVE TEAM

HARSHDEEP DHALIWAL
EDITOR-IN-CHIEF

ALYSSA GEORGESCU
COMMUNICATIONS DIRECTOR

SASHA LANG
SOCIAL MEDIA DIRECTOR

BELLA CHANG
JUNIOR EXECUTIVE

MARIYAH SHAIKH
JUNIOR EXECUTIVE

FREDDY BISHAY
DESIGN DIRECTOR

EDITORIAL TEAM

SECTION EDITORS

Alyssa Murdoch
Habiba Imam
Hibaa Hasan
Sandy Luu

REVIEW EDITORS

Aaliyah Kapadia
Alexa Braverman
Ava Homiar
Bella Chang
Iqra Abid
Kunika Singh
Kyle Albuquerque-Boutilier
Olivia Kenny
Parham Seyedmazhari
Shannon Untch
Sorina Andrei
Victor Phan

COPY EDITORS

Elyse Yuan
Emma Resendes
Eniola Bode-Akinboye
Hannah Ross
Julia Gollob
Mahnoor Butt
Nolee Wallbanks
Ryan Hodgson
Skade Fernando
Thrisha Uthayakumar

SOCIAL MEDIA TEAM

Anissa Chavda
Emily Melo
Mahnoor Butt

DESIGN TEAM

Alyssa Georgescu
Kaitlyn Mah

LETTER FROM THE EDITOR

Dear Psynapse Reader,

Welcome to the sixth issue of Psynapse: McMaster Undergraduate Journal of Psychology, Neuroscience & Behaviour! In this issue, you will encounter several Psychology, Neuroscience & Behaviour works from our dedicated undergraduate students.

I would like to thank every individual who has helped make this issue possible, as each person played a significant role in its publication. Your interest and enthusiasm to contribute to undergraduate research is exemplary. I hope this issue inspires you to explore your fields of study and become involved in the research community – both at McMaster and other external opportunities.

To the executive team, thank you for your dedication to Psynapse throughout this year, I would not have been able to imitate this issue's success without you all. Working with everyone motivated me to do my best to meet expectations from all the club members and authors, and I am so grateful for your devotion to share and become involved with promoting student research. I wish you all the best for your future endeavors.

To Freddy Bishay and the design team, thank you for your continued efforts to support the issue's release. Without you all, our issue would lack its creativity and eye-catching graphics!

To the editorial and social media teams, thank you for your patience and efficiency with authors, your fellow members, and executive directors. The issue would not be possible without your efforts.

To aspiring researchers and the authors of this issue, thank you for continuing to ask questions and seeking answers to advance our understanding within the field of Psychology, Neuroscience & Behaviour. I wish you all the best and hope to see your research in our next issue!

Sincerely,

Harshdeep Dhaliwal
Editor-in-Chief 2022–2023

ADVANCED TOPICS/ESSAYS

ADVANCED TOPICS/ESSAYS CONT...

INFOGRAPHIC

PRÉCIS

ABSTRACTS

ADVANCED TOPICS & ESSAYS

PTSD in Survivors of Childhood Trauma:

An Analysis of Psychotherapeutic Interventions

art by kaitlyn mah

by Emma Ziolkowski

Post-traumatic stress disorder (PTSD) is defined as a psychiatric disorder that may present amongst individuals who have experienced, witnessed, or been exposed to details of a traumatic event (APA, 2020). A traumatic event can occur at any point throughout the lifespan. 14–43% of individuals experience at least one traumatic event before the age of eighteen (National Centre for PTSD, 2018). Of those exposed, 1–15% will develop PTSD. The overall incidence rate of PTSD is 15.9%, with particular risk for girls and those exposed to interpersonal trauma (Alisic et al., 2014). In cases of childhood trauma, it is suggested that a child's stage of cognitive development plays a central role in making sense of trauma (Armsworth & Holaday, 1993). The role of adverse childhood experiences (ACE) and the timing of these events in relation to developmental outcomes has been noted in literature (Herzog & Schmahl, 2018). The experience of trauma may produce significantly different clinical outcomes; treatment requires dy-

namic options that consider the development of youth with ACE. This paper will explore the various ways in which trauma manifests in the body and mind, risk factors that exist, and finally treatment options that are available to individuals with PTSD. This paper aims to demonstrate the importance of psychotherapy as treatment to target both the physiological-somatic and psychological effects of PTSD. Developing an understanding of trauma and its effects developmentally is a vital component in treatment. Though the impact of these experiences is still being investigated, research examines the physiological-somatic and psychological effects that manifest due to trauma. Psychological effects include time distortions, inability to recall details, intrusive imagery, foreshortened sense of future, altered goals, hypervigilance, alertness, and guardedness (Armsworth & Holaday, 1993). Individuals with traumatic events experience hyperawareness and over-attention of stimuli, whether harmful or not, loneliness, dissociation, sleep disturbances, tension, increased use of psychoactive substances, higher reports of suicide attempts, and re-victimization (Herzog & Schmahl, 2018; Molero-Zafra et al., 2022). Physiological-somatic effects include traumatic reminders, hyperarousal, low tolerance for stress, alternating between startle and numbing responses to reminder stimuli, sleep disorders, and fatigue (Armsworth & Holaday, 1993).

Various risk factors impact outcomes for individuals with a history of childhood trauma. The severity of an event, a parent or caregiver's reaction, and the child's proximity to an event will impact both the onset and the severity of PTSD (National Centre for PTSD, 2018). Additionally, the likelihood of receiving a PTSD diagnosis increases as the number of traumatic events a youth is exposed to grows. The impact of risk factors may play more or less of a role in individual outcomes if they occurred during certain vulnerable development phases, increasing the risk for subsequent ACE-related disorders (Herzog & Schmahl, 2018). Considering the nature of trauma, the impact of risk factors, and the dynamic components that inform recovery, treatment should address PTSD not only as a disorder, but as a unique experience for each individual.

Psychotherapy, sometimes referred to as therapy, or counselling, is one avenue of treatment that trauma survivors may access. Clients, also known as patients, may receive psychotherapy as a stand-alone treatment, or often, in conjunction with a biomedical intervention, such as selective serotonin reuptake inhibitors (SSRI's). Engaging in therapy is an attempt to achieve resolution, learning, and social involvement with the support of a trained professional (McLeod, 2019). A key factor underlying these themes of achievement is the notion of 'being stuck' or demoralised and finding ways to 'move forward' with one's life. Therapy is often

viewed as a process, one that emphasizes change rather than remaining stagnant. Several personal gains may arise from the experience of therapy. These personal gains include a variety of physiological, somatic, and psychological improvements that have been documented in clinical trials and literature that will be explored in the remainder of this paper. Psychotherapy allows clients the experience of symptom improvement and recovery related to PTSD caused by ACE. Demonstrated through its physiological-somatic and psychological benefits, psychotherapy is a viable and potentially essential treatment option.

Psychotherapeutic interventions have demonstrated their efficacy through documented physiological-somatic changes. Firstly, psychotherapy has been seen to produce changes in cortisol and dehydroepiandrosterone (DHEA) plasma levels that are commonly associated with PTSD (Olff et al., 2007). PTSD has been associated with the dysregulation of an individual's neuroendocrine system which can be seen within the association of lower cortisol levels in those with PTSD (Olff et al., 2007). Twenty–one patients with chronic PTSD received sixteen weekly 45–60 minute sessions of brief eclectic psychotherapy (BEP) (APA, 2017a). Intervention techniques utilized in BEP include psychoeducation, imaginary exposure, writing assignments, and cognitive restricting (Olff et al., 2007). These techniques support the process of 'giving meaning' to the event and utilizing a farewell ritual at the end of treatment. After sixteen weeks, 71.4% of participants no longer fulfilled criteria for PTSD and did not exhibit comorbid depression. Cortisol and DHEA levels differed significantly from those who responded to treatment and those who did not (Olff, et al., 2007). Responders' cortisol and DHEA levels increased towards normal levels while non-responders decreased in alignment with the neuroendocrine association The utility of psychotherapy is shown through its physiological-somatic effects in cortisol and DHEA levels. Effective psychotherapy may improve low cortisol and DHEA levels. These physiological-somatic benefits support the general conclusion that psychotherapy is a beneficial course of treatment for individuals.

A large argument for the use of psychotherapy in treating PTSD is its potential benefits for psychological symptoms. Two common therapies utilized are cognitive therapy for PTSD (CT-PTSD), and trauma focused cognitive behavioural therapy (TF-CBT). CT-PTSD aims to reverse mechanisms that may maintain PTSD such as trauma-related misappraisals, trauma memories, and maladaptive behavioural and cognitive coping strategies (Ehlers & Clark, 2000). Psychological characteristics of traumatic memories are addressed, such as flashbacks and somatic symptoms (Meiser-Stedman et al., 2017). CT-PTSD also fosters psychological coping strategies, such as cognitive

restructuring, intended for maladaptive behaviours. This allows individuals to identify limiting cognitions and choose appropriate behaviours that support their well-being. The effects of CT-PTSD have been shown to significantly lower symptom severity and symptoms counts, with 77% of treatment completers free of diagnostic criteria for PTSD post treatment (Mesier-Stedman, 2017). Additionally, there were significant decreases in self-reported PTSD symptoms, interpersonal problems, and post-traumatic cognitions. CT-PTSD differs from CBT in that it exclusively focuses on cognitions to address changes opposed to considering behaviours and cognitions (Jewell, 2011). Additionally, TF-CBT aims to reduce symptoms among children and adolescents alongside parents and caregivers (Diehle et al., 2015). Both CT-PTSD and TF-CBT utilize problem solving, a change focused approach, and pay close attention to cognitive processes, to effectively treat PTSD (McLeod, 2019). Symptoms are reduced through psychoeducation, relaxation, affective expression, regulation, and psychological coping (Diehle et al., 2015). One method of tracking the improvement of symptoms is through the Clinician-Administered PTSD Scale (CAPS-CA). The CAPS-CA score is a clinical interview that is standardized to assess the seventeen post-traumatic stress symptoms (PTSSs) in alignment with the Diagnostic and Statistical Manual of Mental Disorders Four (DSM-IV) (Diehle et al., 2015). A 2015 study demonstrated improved CAPS-CA scores by 20 points in both TF-CBT and Eye Movement Desensitization and Reprocessing Therapy (EMDR) groups (Diehle et al., 2015). Additionally, 85% of children no longer met criteria after receiving TF-CBT, and 88% recovered in the EMDR group (Diehle et al., 2015). The use of psychotherapy provides both clinically demonstrated and self-reported psychological improvements.

In terms of clinical improvement, both EMDR and TF-CBT showed major reduction of PTSS during sessions three and four in both conditions, at which point exposure and cognitive restructuring had been targeted (Diehle et al., 2015). EMDR's protocol includes psychoeducation about trauma and therapy, preparation of the target memory, desensitization of the memory, identification and processing of bodily sensations, and re-evaluation of the target (Diehle et al., 2015). EMDR is unique in its approach because of its direct focus on the traumatic memory itself (APA, 2017b). As opposed to treating an individual's relation and emotional state to their trauma, EMDR focuses on the way traumatic memories are stored to decrease problematic symptoms (APA, 2017b). Results demonstrate improvements in physiological, cognitive, and emotional symptoms. Significant decreases were seen in self-reported PTSD symptoms, interpersonal problems, and post-traumatic cognitions (Van Vliet et al., 2021). 66.8%

of participants no longer met PTSD diagnostic criteria and only 3.3% still met criteria for complex PTSD, comparable to 28.9% at pre-treatment (Van Vliet et al., 2021). Symptoms for participants in a phase-based approach stayed consistent until EMDR was implemented, whereas immediately treated participants had a gradual decrease for the entire duration of treatment (Van Vlliet et al., 2021). Given these results, there are considerations to be made about the symptomatic effects of intervening shortly after a trauma. Due to participants in the phase-based approach only displaying symptom improvement upon treatment in comparison to those who received treatment for the entire duration of the study, it may benefit survivors of trauma to receive treatment promptly after a traumatic incident. The relation between intervening and symptom improvement further demonstrates not only the importance of utilizing therapy in treatment, but the importance of commencing treatment as soon as possible.

The process of undergoing psychotherapy holds the potential for physiological-somatic and psychological benefits. Psychotherapy provides the opportunity for individuals to address their trauma directly and/or indirectly, reduce symptoms, and ultimately find meaning to move forward with their lives. These opportunities for growth are seen throughout research documenting changes physiological-somatically and psychologically. The physiological-somatic and psychological changes seen within clinical trials and studies demonstrate that psychotherapy is a viable, and arguably essential form of treatment for PTSD.

References

Alisic, E., Zalta, A., Van Wesel, F., Larsen, S., Hafstad, G., Hassanpour, K., & Smid, G. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: Meta-analysis. *British Journal of Psychiatry*, *204*(5), 335-340. https://doi.org/10.1192/bjp.bp.113.131227

Armsworth, M. W., & Holaday, M. (1993). The effects of psychological trauma on children and adolescents. *Journal of Counseling & Development*, *72*(1), 49-56. https://doi.org/10.1002/j.1556-6676.1993.tb02276.x

APA. (2017a, May). *Brief Eclectic Psychotherapy (BEP)*. American Psychological Association. https://www.apa.org/ptsd-guideline/treatments/brief-eclectic-psychotherapy

APA. (2017b, May). *Eye Movement Desensitization and Reprocessing (EMDR) Therapy*. American Psychological Association. https://www.apa.org/ptsd-guideline/treatments/eye-movement-reprocessing

APA. (2020, August, n.d.). *What is Posttraumatic Stress Disorder (PTSD)?* American Psychiatric Association. https://psychiatry.org/patients-families/ptsd/what-is-ptsd

Diehle, J., Opmeer, B. C., Boer, F., Mannarino, A. P., & Lindauer, R. J. (2015). Trauma-focused cognitive behavioral therapy or eye movement desensitization and reprocessing: What works in children with posttraumatic stress symptoms? A randomized controlled trial. *European child & Adolescent Psychiatry*, *24*(2), 227-236. https://doi.org/10.1007/s00787-014-0572-5

Herzog, J. I., & Schmahl, C. (2018). Adverse childhood experiences and the consequences on neurobiological, psychosocial, and somatic conditions across the lifespan. *Frontiers in Psychiatry*, *9*, 420. https://doi.org/10.3389/fpsyt.2018.00420

Jewell, J. (2011). Cognitive Therapy (CT). In Goldstein, S., Naglieri, J.A. (Eds.), *Encyclopedia of Child Behavior and Development* (pp. 384-385). Springer, Boston, MA. https://doi.org/10.1007/978-0-387-79061-9_613

McLeod, J. (2019). *An Introduction to Counselling and Psychotherapy: Theory, Research and Practice*. McGraw-Hill Education.

Meiser-Stedman, R., Smith, P., McKinnon, A., Dixon, C., Trickey, D., Ehlers, A., Clark, D.M., Boyle, A., Watson, P., Goodyer I., & Dagleish, T. (2017). Cognitive therapy as an early treatment for post-traumatic stress disorder in children and adolescents: A randomized controlled trial addressing preliminary efficacy and mechanisms of action. *Journal of Child Psychology and Psychiatry*, *58*(5), 623-633. https://doi.org/10.1111/jcpp.12673

Molero-Zafra, M., Mitjans-Lafont, M. T., Hernández-Jiménez, M. J., & Pérez-Marín, M. (2022). Psychological Intervention in Women Victims of Childhood Sexual Abuse: An Open Study—Protocol of a Randomized Controlled Clinical Trial Comparing EMDR Psychotherapy and Trauma-Based Cognitive Therapy. *International Journal of Environmental Research and Public Health*, *19*(12), 7468. https://doi.org/10.3390/ijerph19127468

National Centre for PTSD. (2018, September 18). *How Common is PTSD in Children and Teens?* U.S. Department of Veterans Affairs. https://www.ptsd.va.gov/understand/common/common_children_teens.asp

Olff, M., de Vries, G. J., Güzelcan, Y., Assies, J., & Gersons, B. P. (2007). Changes in cortisol and DHEA plasma levels after psychotherapy for PTSD. *Psychoneuroendocrinology, 32*(6), 619-626. https://doi.org/10.1016/j.psyneuen.2007.04.001

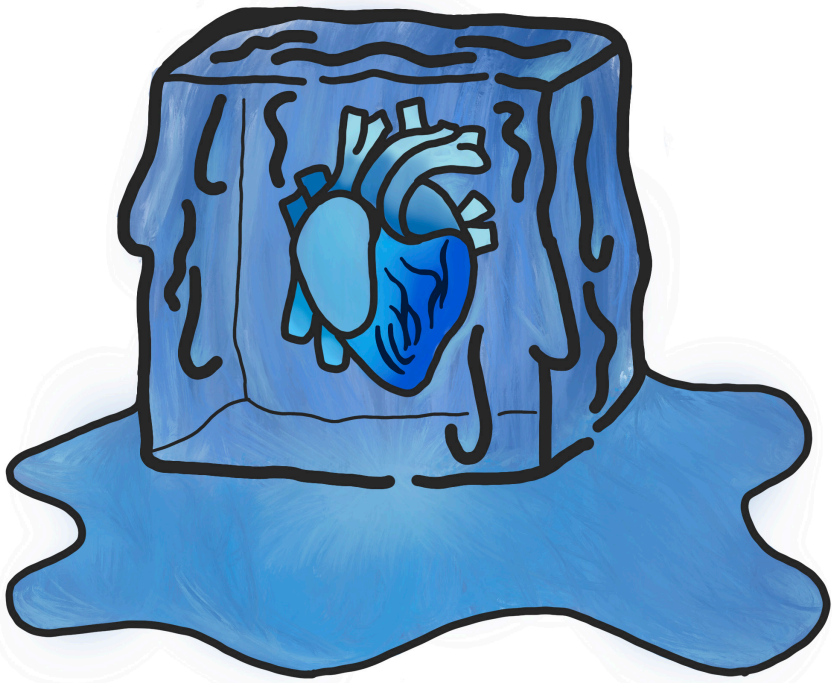
Van Vliet, N. I., Huntjens, R. J., Van DIjk, M. K., Bachrach, N., Meewisse, M. L., & De Jongh, A. (2021). Phase-based treatment versus immediate trauma-focused treatment for post-traumatic stress disorder due to childhood abuse: randomised clinical trial. *BJPsych Open*, *7*(6), E211. https://doi.org/10.1192%2Fbjo.2021.1057

by Noah Smith

An Evolutionary Argument for the Psychological Benefits of Cold Water Therapy

The water hits your skin—you have never felt something so cold. The thought of cold water therapy (CWT), therapeutic subjection to a painfully cold source of water, makes you wince. Even the thought of running out of hot water during your morning shower seems dreadful. Although painful, CWT elicits a stress response that produces several cognitive benefits. Using the principles of evolution by natural selection, we gain insight into why the stress response arises (Nesse et al., 2007), and we can understand why pain alters animal cognition. In all animals, brief painful experiences produce cognitive effects. The painful properties of CWT provide psychological benefits.

Pain induces a stress response. Our ancestors faced many threats to their survival. Threats such as predatory pursuit and pain induce an evolutionarily adaptive stress response (Nesse et al., 2007). The stress response heightens alertness (Foo & Mason, 2003), heart rate (Hamunen et al., 2012), respiratory rate (Jafari et al., 2017), and produces other physiological effects. Animals exhibit the stress response



art by alyssa georgescu

due to natural selection: over generations, the most evolutionarily advantageous behaviours and traits—those that improve survival and mating opportunities—become commonplace, since the animals who possess these traits achieve greater reproductive success (Darwin, 1859; Nesse et al., 2007). The stress response increases an organism's chance of survival during painful experiences, which lengthens their potential lifespan (Nesse et al., 2007). In mammals, an increased lifespan improves reproductive success, since longer-lived animals have more opportunities to mate (Weladji et al., 2006). Increased reproductive success allows animals to more often pass on their genes and behaviors to future generations. The stress response was naturally selected due to its survival benefits: sharpened attention may help animals be more aware of their environment and predators, and increased heart and respiratory rates confer motor benefits (which allow animals to flee more successfully). Not only does the stress response generate physiological effects, but it also affects complex cognitive behaviours, such as learning.

The response to pain changes animal cognition (Shors, 2004). A cognitively beneficial stress response was naturally selected since it would have prolonged survival (Nesse et al., 2007). Non-human animal behaviour data supports this theory, since many non-human animals exhibit heightened cognitive abilities after experi-

encing pain. After a mild shock, male rats exhibited better associative learning (Shors et al., 1992; Shors, 2001). Compared to un-shocked rats, shocked rats performed better at pairing a conditioned stimulus to an unconditioned stimulus and exhibited a conditioned response more quickly (Shors et al., 1992). In a similar experiment, researchers starved fish to generate a painful state. Then, starved fish could choose between feeding in an electrified chamber which delivered mild shocks or staying in a non-electrified chamber without food. Starved fish quickly started feeding in the electrified chamber, since it relieved their hunger pains (Millsopp & Laming, 2008). Conversely, fed control fish refused to enter the electrified chamber to feed. The stress response in the hungry fish induced an attentional shift towards food, since food became more important to starved fish than the pain of a mild electric shock. Despite the painful shocks, the starved fish entered the electrified chamber to dull their hunger pains (Millsopp & Laming, 2008). Evolutionary theory and non-human animal behavior data suggest that transient painful experiences shift attention, and human data also suggests that brief bouts of pain may benefit cognition.

We can use CWT's painful properties to provide attentional benefits. Like other painful experiences, immersion in cold water generates a stress response (Šrámek et al., 2000). As with other animals, a stress response in humans can generate cognitive benefits. In a randomized controlled trial, participants practiced CWT by taking cold showers for either 30, 60, or 90 seconds a day, while the control group continued taking hot showers (Buijze et al., 2016). Participants in the cold therapy treatment frequently reported a feeling of rejuvenation and a 'caffeine-like' effect after CWT. CWT as brief as 30 seconds consistently generated this caffeine-like effect (Buijze et al. 2016). In another study, one group of participants immersed their dominant hand into a bucket of ice water for one minute, while a control group immersed their dominant hand into lukewarm water. On a subsequent test, the ice water group more quickly identified items which had appeared on a recently viewed screen (Duncko et al., 2009). Immersion into cold water also promotes quicker associative learning in humans—after CWT, we more quickly pair a stimulus with a response (Duncko et al., 2007). Lastly, even 30 minutes after CWT, people tend to make fewer mistakes and learn routes more quickly in virtual navigation tasks (Duncko et al., 2007). Each of these results aligns with evolutionary theory: the brief pain CWT incurs induces the stress response, leading to heightened alertness and learning (Nesse et al., 2007). CWT's learning benefits likely stem from its ability to improve alertness—when we are more alert, we can pay closer attention to stimuli, which in turn allows us to remember and recall them more easily (Souza

et al., 2014). The cognitive benefits of CWT may motivate people to continue CWT despite its uncomfortableness: in a 90-day follow up, 64% of people randomly assigned to CWT treatment arms still partook in a cold-shower CWT routine (Buijze et al., 2016).

CWT can improve focus. Due to its painful properties, CWT elicits an evolutionarily adaptive stress response (Nesse et al., 2007). This response improves learning ability (Duncko et al., 2007) and working memory performance (Duncko et al., 2009), likely due to its effect on alertness—a "caffeine-like" effect (Buijze et al., 2016). These effects could benefit college students, three quarters of whom report excessive sleepiness at some point throughout the school week (Lund et al., 2010). Despite its brief unpleasantness, students could use CWT to improve attention and reduce fatigue before classes and study sessions. Despite the research that lends support to CWT's cognitive benefits (Duncko et al., 2007, Duncko et al., 2009), more rigorous testing should be conducted on the full extent of CWT's effects. Rigorous testing could help cement CWT as a low-risk, cognitively beneficial practice. Specifically, experiments which randomly assign participants to a long-term treatment of either CWT or non-CWT (e.g., Buijze et al., 2016) and then measure attention and working memory performance (e.g. Duncko et al., 2009), could help us draw stronger conclusions about CWT's cognitive effects. It may be terrifying but running out of hot water during morning showers may bring many benefits.

References

Buijze, G. A., Sierevelt, I. N., Heijden, B. C. J. M. van der, Dijkgraaf, M. G., & Frings-Dresen, M. H. W. (2016). The Effect of Cold Showering on Health and Work: A Randomized Controlled Trial. *PLOS ONE*, *11*(9), e0161749. https://doi.org/10.1371/journal.pone.0161749

Darwin, C. (1859). *On the origin of species by means of natural selection, or, the preservation of favoured races in the struggle for life*. John Murray.

Duncko, R., Cornwell, B., Cui, L., Merikangas, K. R., & Grillon, C. (2007). Acute exposure to stress improves performance in trace eyeblink conditioning and spatial learning tasks in healthy men. *Learning & Memory*, *14*(5), 329–335. https://doi.org/10.1101/lm.483807

Duncko, R., Johnson, L., Merikangas, K., & Grillon, C. (2009). Working memory performance after acute exposure to the cold pressor stress in healthy volunteers. *Neurobiology of Learning and Memory*, *91*(4), 377–381. https://doi.org/10.1016/j.nlm.2009.01.006

Foo, H., & Mason, P. (2003). Brainstem modulation of pain during sleep and waking. *Sleep Medicine Reviews*, *7*(2), 145–154. https://doi.org/10.1053/smrv.2002.0224

Hamunen, K., Kontinen, V., Hakala, E., Talke, P., Paloheimo, M., & Kalso, E. (2012). Effect of pain on autonomic nervous system indices derived from photoplethysmography in healthy volunteers. *BJA: British Journal of Anaesthesia*, *108*(5), 838–844. https://doi.org/10.1093/bja/aes001

Jafari, H., Courtois, I., Van den Bergh, O., Vlaeyen, J. W. S., & Van Diest, I. (2017). Pain and respiration: A systematic review. *Pain*, *158*(6), 995–1006. https://doi.org/10.1097/j.pain.0000000000000865

Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep Patterns and Predictors of Disturbed Sleep in a Large Population of College Students. *Journal of Adolescent Health*, *46*(2), 124–132. https://doi.org/10.1016/j.jadohealth.2009.06.016

Nesse, R. M., Bhatnagar, S., & Young, E. A. (2007). Evolutionary Origins and Functions of the Stress Response. *Encyclopedia of Stress*, *1*, 6.

Shors, T. J. (2001). Acute Stress Rapidly and Persistently Enhances Memory Formation in the Male Rat. *Neurobiology of Learning and Memory*, *75*(1), 10–29. https://doi.org/10.1006/nlme.1999.3956

Shors, T. J. (2004). Learning During Stressful Times. *Learning & Memory*, *11*(2), 137–144. https://doi.org/10.1101/lm.66604

Shors, T., Weiss, C., & Thompson, R. (1992). Stress-Induced Facilitation of Classical Conditioning. *Science* (New York, N.Y.), *257*, 537–539. https://doi.org/10.1126/science.1636089

Souza, A. S., Rerko, L., Lin, H.-Y., & Oberauer, K. (2014). Focused attention improves working memory: Implications for flexible-resource and discrete-capacity models. *Attention, Perception, & Psychophysics*, *76*(7), 2080–2102. https://doi.org/10.3758/s13414-014-0687-2

Šrámek, P., Šimečková, M., Janský, L., Šavlíková, J., & Vybíral, S. (2000). Human physiological responses to immersion into water of different temperatures. *European Journal of Applied Physiology*, *81*(5), 436–442. https://doi.org/10.1007/s004210050065

Weladji, R. B., Gaillard, J.-M., Yoccoz, N. G., Holand, Ø., Mysterud, A., Loison, A., Nieminen, M., & Stenseth, N. C. (2006). Good reindeer mothers live longer and become better in raising offspring. *Proceedings of the Royal Society B: Biological Sciences*, *273*(1591), 1239–1244. https://doi.org/10.1098/rspb.2005.3393

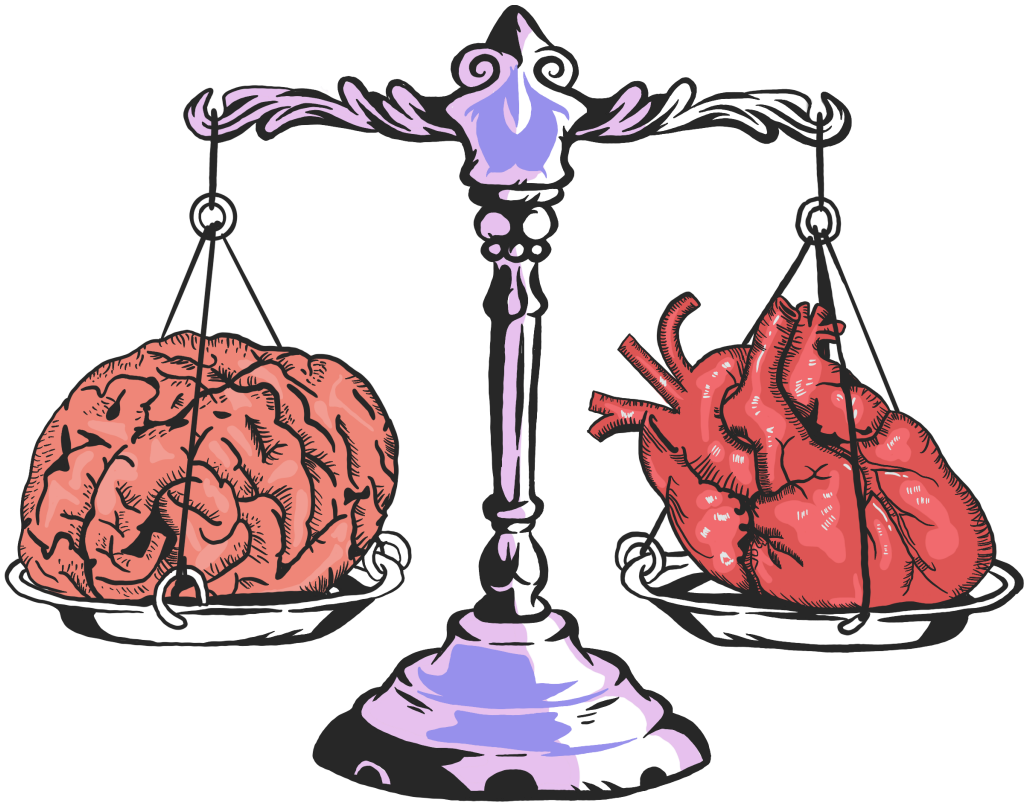
Emotional Intelligence in Medicine

by Freddy Bishay

Imagine being in a hospital. One of your parents just had a heart attack, and both the physicians and nurses seem apathetic and unconcerned about your parent's fate. This feeling that medical professionals are indifferent to your emotions is sadly common. Medical professionals have varying emotional intelligence (EI)—a type of social intelligence where individuals understand and correctly respond to others' emotions (Lin et al., 2015). A medical professional's EI affects their competency; their ability to be effective healthcare workers. The effects of low EI could potentially have dire outcomes on a patient's life and health. The way a medical professional reacts to and empathizes with their patient's emotions does not only affect the patient, but it can have drastic effects on a healthcare worker's quality of life as well. EI improves medical professionals' competency.

High EI decreases medical professionals' burnout rates. Burnout is a feeling of fatigue, pessimism, and hopelessness that individuals may experience for many reasons. In healthcare workers, burnout is more commonly experienced as emotional exhaustion that results from the sensitive situations they deal with daily, leading to apathy and unconcern for patients' emotions (Lin et al., 2015). A dangerously high amount of medical professionals experience burnout. In the United States, over half of physicians, around forty percent of nurses, and around seventy percent of medical students experience burnout (Reith, 2020). Fortunately, high EI shields against emotional exhaustion and burnout, in turn improving a medical professional's job satisfaction, mental health, and confidence (Gleichgerrcht & Decety, 2013). High EI benefits mental health and quality of life, which can greatly enhance a medical professional's ability to be a good healthcare provider

Low burnout rates in medical professionals increase patient satisfaction. Patients' satisfaction with their medical treatment is highly variable; it depends on their medical professional's abilities. Healthcare workers with low burnout rates have emotional availability and the capability of empathizing with patients' hardships, ultimately increasing patient satisfaction. Patients completed inter-



art by alyssa georgescu

views that evaluated their care satisfaction. Results showed that the patients favoured physicians with low burnout rates and high EI (Weng et al., 2011). When burnt out, a professional feels apathy for patients, lacks self-belief, and has lower job satisfaction—three characteristics that negatively affect patient satisfaction and health (Argentero et al., 2008). Patient satisfaction and professional job satisfaction follow a cyclical pattern. The more confident and satisfied a medical professional becomes with their provided care, the happier their patients become with their treatment, and vice versa. Considering patients' satisfaction with their treatment is crucial, as their psychological perceptions can drastically affect their physiological health. A patient unsatisfied with their treatment could have life-threatening physiological reactions to treatment.

High EI, the corresponding low burnout rates, and high patient satisfaction improve medical professionals' quality of care. EI benefits medical professional's mental health and heightens their patients' comfort, significantly impacting the overall quality of care that a healthcare worker can provide. Quality of care encompasses several aspects of healthcare workers' abilities, including hygiene compliance, work experience, and patient outcomes (Codier et al., 2008). A medical professional's quality of care is a hallmark way of measuring their competency and ability to treat, diagnose, and be compas-

sionate with patients. Patient quality of care improves with their clinical staff's EI scores. A medical professional's emotional awareness ultimately leads to fewer clinical errors, positively affecting patients' health (Adams & Iseler, 2014). The complexity of EI's effects on medical professionals, themselves, their patients, and the overall functionality of a healthcare team is essential to understand when analyzing a healthcare worker's competency. Thus, a medical professional's EI is imperative as it could potentially save and prolong thousands of lives.

Instructional medicinal programs should teach and assess EI. Considering EI can drastically affect medical professionals' life satisfaction and their patients' well-being, it is clear that there needs to be a way to ensure that all medical professionals are high in EI. Instructional university programs that educate nurses, physicians, physician assistants, and other healthcare workers should teach and encourage positive EI practices in specialized emotional training classes. Programs should also require a certain EI level to graduate, which could be done by adding exam sections within already-required assessments. Once a healthcare student graduates, annual mandatory assessments should evaluate EI to ensure consistently empathetic care across a medical professional's career. Minor enhancements to medicinal programs that include EI training could save countless lives, including those of medical professionals themselves who could have developed mental disorders due to their above-average burnout rates.

References

Adams, K. L., & Iseler, J. I. (2014). The relationship of bedside nurses' emotional intelligence with quality of care. *Journal of Nursing Care Quality*, *29*(2), 174–181. https://doi.org/10.1097/ncq.0000000000000039

Argentero, P., Dell'Olivo, B., & Ferretti, M. S. (2008). Staff burnout and patient satisfaction with the quality of dialysis care. *American Journal of Kidney Diseases*, *51*(1), 80–92. https://doi.org/10.1111/j.1365-2923.2011.03985.x

Codier, E., Kooker, B. M., & Shoultz, J. (2008). Measuring the emotional intelligence of clinical staff nurses: an approach for improving the clinical care environment. *Nursing Administration Quarterly*, *32*(1), 8–14. https://doi.org/10.1097/01.naq.0000305942.38816.3b

Gleichgerrcht, E., & Decety, J. (2013). Empathy in clinical practice: How individual dispositions, gender, and experience moderate empathic concern, burnout, and emotional distress in physicians. *PLoS ONE*, *8*(4), e61526. https://doi.org/10.1371/journal.pone.0061526

Lin, D. T., Liebert, C. A., Tran, J., Lau, J. N., & Salles, A. (2016). Emotional intelligence as a predictor of resident well-being. *Journal of the American College of Surgeons*, *223*(2), 352–358. http://dx.doi.org/10.1016/j.jamcollsurg.2016.04.044

Reith, T. P. (2018). Burnout in United States healthcare professionals: A Narrative Review. *Cureus*, *10*(12), e3661. https://doi.org/10.7759/cureus.3681

Weng, H. C., Hung, C. M., Liu, Y. T., Cheng, Y. J., Yen, C. Y., Chang, C. C., & Huang, C. K. (2011). Associations between emotional intelligence and doctor burnout, job satisfaction and patient satisfaction. *Medical Education*, *45*(8), 835–842. https://doi.org/10.1111/j.1365-2923.2011.03985.x

If The Shoe Fits

How Biased Diagnostic Criteria for Attention Deficit Hyperactivity Disorder Leads to the Underdiagnosis of Females

by Spencer Metcalfe

Introduction

The conceptualization of attention-deficit/hyperactivity disorder (ADHD) is heavily influenced by society's norms and values. The most prominent indicators of the disorder include inattention, hyperactivity, and impulsivity, as outlined in the Diagnostic and Statistical Manual (DSM) used to classify, conceptualize, and diagnose mental disorders (American Psychiatric Association, 2013). Despite being one of the most researched mental disorders, the prevalence of ADHD remains highly controversial, especially as it relates to sex-linked prevalence rates. While ADHD is thought to be more prevalent in males than females, females may be underdiagnosed because their symptoms present in ways that are less obvious to others, even though the underlying pathology is the same (Ohan & Johnston, 2005). The diagnostic criteria for attention-deficit/hyperactivity disorder does not account for the differences in how the disorder presents between males and females, and there is concern regarding whether these sex differences are adequately represented in symptom profiles. Those who do not receive a diagnosis based on their symptoms may undergo the wrong treatment or none at all, prompting a re-evaluation of the diagnostic criteria for ADHD.

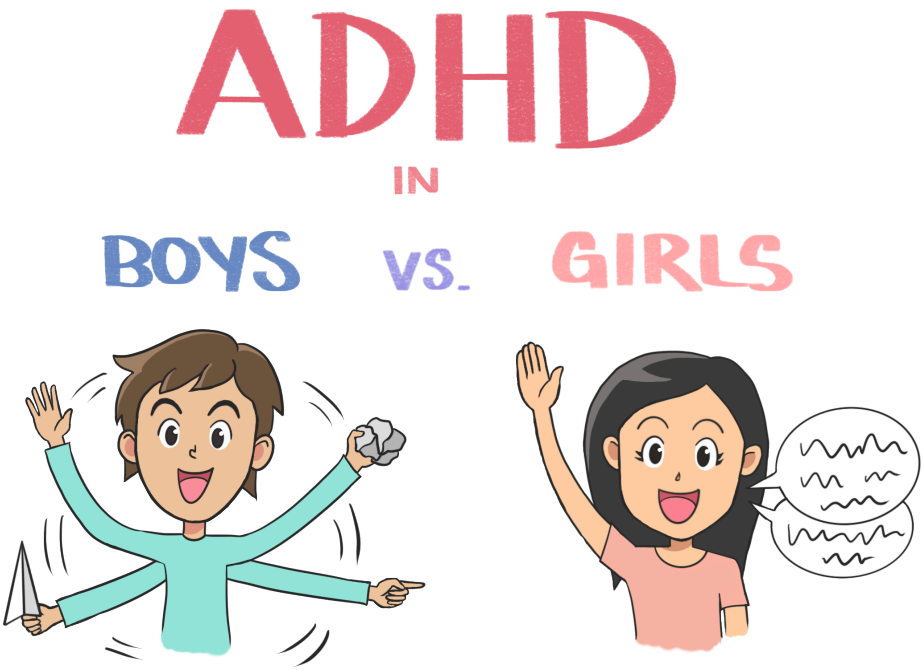
Evidence of Male Skewed ADHD Prevalence Rates

Relative to males, females are underdiagnosed with ADHD, and this is largely an implication of biased diagnostic criteria. Large population-based studies have reported prevalence rates of ADHD that exceed typical sex-specific estimates, with boys being upwards of nine times more likely to receive an ADHD diagnosis (Ramtekkar et al., 2010; Fresson et al., 2018). Reported prevalence rates rely directly on diagnoses; if whether or not a diagnosis is given based on criteria that do not account for all possible presentations of the disorder, prevalence rates will be skewed, further perpetuating the idea that ADHD is a disorder that primarily affects young males. Teachers and childhood educators play a large role in determining which children get referred for an ADHD specialist. Children who's symptoms are externally projected and are disruptive in a classroom setting are more likely to be noticed by their educators, and are more likely to be referred

for a diagnosis (Coles et al., 2010). Research has found that in two cases with children displaying identical behaviours, teachers report that the female actor is more impaired than the male, because these symptoms are thought to be out of the ordinary for young females to engage in (Coles et al., 2010; Young et al., 2020). However, the male students were more likely to be referred for evaluation because of the regular association that is made between these behaviours in young males and an ADHD diagnosis (Coles et al., 2010). Females are left with undiagnosed and untreated ADHD because their symptoms are not recognized as indicators of the disorder to the same degree as males.

Differences in Presentation of ADHD Symptoms Between the Sexes

ADHD presents differently in males and females due to biological and social factors. Studies have shown that boys and girls with ADHD show unique abnormalities in frontal lobe development, the part of the brain responsible for impulsivity, social interaction, and attention (Mahone et al., 2011). These sex-specific brain abnormalities contribute to sex-specific presentations of the disorder (Mahone et al., 2011). Generally, males tend to exhibit more externalized symptoms, which allow for timely diagnostic evaluations (De Rossi et al., 2022). Females experience predominantly inattentive symptoms, such as difficulty concentrating, which are less noticeable, and less disturbing in social contexts (De Rossi et al., 2022). Girls are also better at coping with these symptoms and mask them to conform to social norms (De Rossi et al., 2022). Internalized manifestations of ADHD leave females with a symptom profile that is dismissed or misidentified as another disorder, contributing to the underdiagnosis of females.



art by kaitlyn mah

The Underdiagnosis of Females

Differences in ADHD presentation are not accounted for in diagnostic criteria, likely causing the underdiagnosis of ADHD in females. The diagnostic criteria outlined in the DSM, the manual used to classify and conceptualize mental disorders, were developed and validated using samples of school-aged males, creating concern for leaving females with the disorder unaccounted for (Ohan & Johnston, 2005). As a result, prevalence rates do not accurately reflect male-to-female ratios. It is not that females have ADHD less frequently than males, it is that they fit the diagnostic criteria less frequently (Mowlem et al., 2018). It has been argued that the stereotypical hyperactive and inattentive male student has made boys seem highly representative of the entire ADHD population. These shared beliefs affect how therapists make judgements about diagnosing the disorder (Fresson et al., 2018). Therapists shown a short video of children without ADHD diagnosed the disorder two times more in the version with a male actor (Bruchmüller et al., 2012). Females cannot be overlooked for ADHD diagnoses because they show symptoms outside of a set of criteria that were developed on a male sample.

Conclusion

Reported prevalence estimates do not account for biased diagnosis of ADHD between the sexes, implying that females have the disorder less frequently than males. While it remains unknown how often ADHD diagnoses are misinterpreted or missed completely in female patients, a better understanding of how the disorder presents outside of the male stereotype is necessary for improving clinical and functional outcomes. Biased diagnostic criteria negatively impact both sexes. Females left undiagnosed suffer lifelong consequences of being misdiagnosed or going without appropriate treatment. Given both biological and social explanations for sex-specific presentations of the disorder, diagnostic criteria for ADHD must be specified based on sex to account for these differences, and to avoid making diagnoses based on stereotypes and expectations.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596.

Bruchmüller, K., Margraf, J., & Schneider, S. (2012). Is ADHD diagnosed in accord with diagnostic criteria? Overdiagnosis and influence of client gender on diagnosis. *Journal of Consulting and Clinical Psychology*, *80*(1), 128–138.

Coles, E. K., Slavec, J., Bernstein, M., & Baroni, E. (2010). Exploring the gender gap in referrals for children with ADHD and other disruptive behavior disorders. *Journal of Attention Disorders*, *16*(2), 101–108. https://doi.org/10.1177/1087054710381481

De Rossi, P., Pretelli, I., Menghini, D., D'Aiello, B., Di Vara, S., & Vicari, S. (2022). Gender-related clinical characteristics in children and adolescents with ADHD. *Journal of Clinical Medicine*, *11*(2), 385. https://doi.org/10.3390/jcm11020385

Fresson, M., Meulemans, T., Dardenne, B., & Geurten, M. (2018). Overdiagnosis of ADHD in boys: Stereotype impact on neuropsychological assessment. *Applied Neuropsychology: Child*, *8*(3), 231–245. https://doi.org/10.1080/21622965.2018.1430576

Mahone, E. M., Ranta, M. E., Crocetti, D., O'Brien, J., Kaufmann, W. E., Denckla, M. B., & Mostofsky, S. H. (2011). Comprehensive examination of frontal regions in boys and girls with attention-deficit/hyperactivity disorder. *Journal of the International Neuropsychological Society*, *17*(6), 1047–1057. https://doi.org/10.1017/s1355617711001056

Mowlem, F. D., Rosenqvist, M. A., Martin, J., Lichtenstein, P., Asherson, P., & Larsson, H. (2018). Sex differences in predicting ADHD clinical diagnosis and pharmacological treatment. *European Child & Adolescent Psychiatry*, *28*(4), 481–489. https://doi.org/10.1007/s00787-018-1211-3

Ohan, J. L., & Johnston, C. (2005). Gender appropriateness of symptom criteria for attention-deficit/hyperactivity disorder, oppositional-defiant disorder, and conduct disorder. *Child Psychiatry and Human Development*, *35*(4), 359–381. https://doi.org/10.1007/s10578-005-2694-y

Ramtekkar, U. P., Reiersen, A. M., Todorov, A. A., & Todd, R. D. (2010). Sex and age differences in attention-deficit/hyperactivity disorder symptoms and diagnoses. *Journal of the American Academy of Child & Adolescent Psychiatry*, *49*(3). https://doi.org/10.1097/00004583-201003000-00005

Young, S., Adamo, N., Ásgeirsdóttir, B. B., Branney, P., Beckett, M., Colley, W., Cubbin, S., Deeley, Q., Farrag, E., Gudjonsson, G., Hill, P., Hollingdale, J., Kilic, O., Lloyd, T., Mason, P., Paliokosta, E., Perecherla, S., Sedgwick, J., Skirrow, C., … Woodhouse, E. (2020). Females with ADHD: An expert consensus statement taking a lifespan approach providing guidance for the identification and treatment of attention-deficit/ hyperactivity disorder in girls and women. *BMC Psychiatry*, *20*(1). https://doi.org/10.1186/s12888-020-02707-9

Examining the Effects of Parenting Style on Juvenile Delinquency

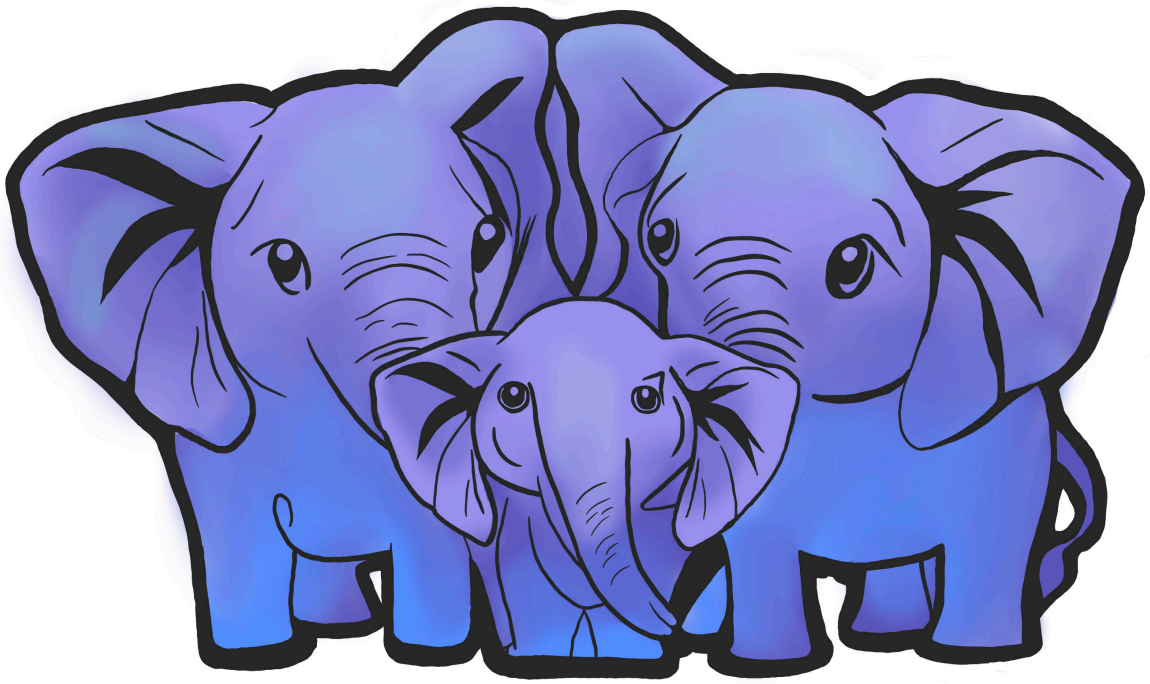
by Arfaa Saeed

Juvenile Delinquency

In recent years, there has been an increase in literature surrounding the topic of youth criminal behaviour. This has stirred public and academic discourse concerning the causes of adolescent offences, and the effectiveness of the juvenile legal system (Young et al., 2017). The term "juvenile delinquent" refers to a young person who is responsible for committing a criminal offence as per the rulings of a local jurisdiction. Delinquency includes a wide range of behaviours that deviate from the rulings of a jurisdiction (Young et al., 2017). According to the 2020 police-reported crime statistics in Canada, the four most prevalent crimes in the 12–17 year old age group consisted of assault, shoplifting, mischief, and justice violations (Statistics Canada, 2021). Research in the juvenile justice field has pointed to various theoretical models that emphasize the interaction of multiple risk factors that increase the likelihood of offending, along with noting protective agents that offset the risk (Shader, 2003). It has given rise to the argument that juvenile delinquents are a product of their environment, and that offending trajectories are a function of a poor environment (Loeber & Farrington, 2012).

Parenting Styles

Though a blend of early life experiences can produce poor behavioural outcomes in adolescents, negative parental attributes have a cumulative effect in increasing the risk (Wright & Wright, 1994). Parenting practices are among the most salient predictors of juvenile delinquency, and often include harsh punishment, abuse of power, and/or a lax, rejecting, neglectful, or abusive parental role (Johnson, 2016). The traditional parenting style theory by Baumrind (1971) and Maccoby and Martin (1983) classifies four major parenting styles based on the level of two dimensions: responsiveness and demandingness. Responsiveness, also known as parental warmth, refers to a parent's ability to offer support and attention to their child's needs, in order to support their development of individuality and self-regulation (Baumrind, 1971). Demandingness, otherwise known as parental control, involves the use of disciplinary measures and supervision to integrate the child into the family and larger society (Baumrind, 1971). The four parenting styles are authoritative (high in demandingness and high in responsiveness), authoritarian (high in demandingness and low in responsiveness), permissive (low in demandingness and high in responsiveness), and neglectful parenting (low in demandingness and responsiveness) (Baumrind, 1971). Various studies draw upon these four parenting styles as a standard measure for parenting strategies.



art by alyssa georgescu

Measures of Parenting Style and Juvenile Delinquency

Research in this area consists of longitudinal studies following the development of adolescents over time and tracking offending behaviors, along with survey-based research conducted in schools and institutions holding incarcerated youth. Research is diverse and cross-cultural, with reports from adolescents living in America, England, Spain, Netherlands, Nigeria, Scotland, South Korea, and China.

Many studies assess the association between two variables: parenting style and youth delinquency. Parenting style is measured through self-reported questionnaires consisting of youth participants rating various maternal and paternal parenting characteristics pertaining to responsiveness and permissiveness/demandingness (Tapia et al., 2018). Factors such as parental affection, communication, promotion of youth independence (Álvarez-García et al., 2016), along with parental support and control (Hoeve et al., 2007), abuse, indifference (Yusuf et al., 2021), acceptance-involvement, and supervision (Xiong et al., 2020) are rated. Similarly, juvenile delinquency is measured using various self-report questionnaires, and is assessed as the amount of offending and the types of crime the adolescent is engaged in (Yusuf et al., 2021).

Optimal Parenting

Across several research studies, it appears that as authoritative parenting increases, juvenile delinquency decreases. There is a consensus that authoritative parenting encompasses the appropriate amount of demandingness and responsiveness that is required to enforce a framework of conduct and discipline on children while simultaneously being responsive to their individual needs (Okorodudu et al., 2010). Parenting that exhibits good regard for acceptance, youth independence, affection, support, and warmth, decreases the risk of delinquency through fostering an environment that is crucial for self-esteem development in children (Balogun et al., 2010). Therefore, characteristics of increased warmth and control lower the likelihood of adolescents engaging in antisocial behaviours such as aggression and associating with delinquent peers that encourage delinquency (Álvarez-García et al., 2016).

Suboptimal Parenting

Neglectful parenting is the parenting style that most strongly predicts juvenile delinquency. Parenting that is overall passive and lacking clear goals, objectives, and limitations, is linked with the highest rates of adolescent offending. Adolescents exposed to a lack of warmth and control have been repeatedly shown to become maladjusted to themselves, their family, and greater society (Okorodudu, 2010). Poor parenting characteristics can increase the susceptibility of adolescents develop-

ing psychological distress, low self-esteem, and antisocial behaviours such as aggression, which opens an avenue for the expression of deviant behaviour (Chambers et al., 2001). Authoritarian parenting has also been linked with delinquency (Hoeve et al., 2007). Thus, parenting styles with low warmth and too little control (neglectful) or too much control (authoritarian), have been associated with the highest levels of adolescent offending (Cho et al., 2021). Adolescents growing up with little parental warmth experience lower levels of love, care, and attention, which can foster feelings of rejection by the parent and manifest in emotional dysregulation. Low self-esteem associated with parental rejection may cause adolescents to foster negative emotions, immature traits, and hostility towards their environment, resulting in externalizing behaviours such as delinquency (Okorodudu et al., 2010). When low warmth is coupled with low control, the child is left without structure and guidance and may experience difficulty in navigating the world through rule-following and respecting the rights of others. In the opposite extreme, low parental warmth combined with high control, creates a lack of autonomy in the child and can foster feelings of resentment for authority figures, increasing the likelihood of rebellious acts (Baumrind, 1971).

Conclusion

The research largely depicts authoritative parenting as the most optimal and protective parenting style against juvenile delinquency. In contrast, neglectful and authoritarian parenting is largely associated with adolescent delinquency. The findings have broad implications for developing interventions against youth offending by targeting optimal parenting skills that emphasize characteristics of parental warmth and control. In the future, research in this field must be broadened to incorporate culturally relevant parenting practices and differences in maternal and paternal roles in parenting across cultures and societies.

References

Balogun, S. K., & Chukwumezie, M. (2010). Influence of Family Relationship, Parenting Style And Self-Esteem On Delinquent Behaviour Among Juveniles in Remand Homes. *Global Journal of Human Social Science Research*, *10*(2). https://doi.org/ 10.6007/IJARBSS/v11-i6/10042

Baumrind, D. (1997). The discipline encounter: Contemporary issues. *Aggression and Violent Behavior*, *2*(4), 321-335. https://doi.org/10.1016/S1359-1789(97)00018-9

Chambers, J., Power, K., Loucks, N., & Swanson, V. (2001). The interaction of perceived maternal and paternal parenting styles and their relation with the psychological distress and offending characteristics of incarcerated young offenders. *Journal of Adolescence*, *24*(2), 209–227. https://doi.org/10.1006/jado.2001.0377

Johnson, S. (2016). Parenting styles and raising delinquent children: responsibility of parents in encouraging violent behavior. *Forensic Research & Criminology International Journal*, *3*(1). https://doi.org/10.15406/frcij.2016.03.00081

Hoeve, M. (2007). Long-Term Effects of Parenting and Family Characteristics on Delinquency of Male Young Adults. *European Journal of Criminology*, *4*(2), 161–194. https://doi.org/10.1177/1477370807074854

Loeber, R., & Farrington, D. P. (2012). From Juvenile Delinquency to Adult Crime: Criminal Careers, Justice Policy and Prevention. *Oxford University Press*. https://doi.org/10.1093/acprof:oso/9780199828166.001.0001

Maccoby, E. E., & Martin, J. A. (1983). Socialization in the Context of the Family: Parent-Child Interaction. *Handbook of Child Psychology: Socialization, Personality, and Social Development, 4*, 1–101. New York: Wiley.

Okorodudu, G. (2010). Influence of parenting styles on adolescent delinquency in delta central senatorial district. *Edo Journal of Counselling*, *3*(1), 58–86. https://doi.org/10.4314/ejc.v3i1.52682

Shader, M. (2003). Risk Factors for Delinquency: An Overview, *Office of Justice Programs*. Retrieved April 18, 2022, from https://www.ojp.gov/ncjrs/virtual-library/abstracts/risk-factors-delinquency-overview

Statistics Canada. (2021, July 27). *Police-reported crime statistics in Canada, 2020*. https://www150.statcan.gc.ca/n1/pub/85-002-x/2021001/article/00013-eng.htm

Tapia, M., Alarid, L. F., & Clare, C. (2018). Parenting Styles and Juvenile Delinquency: Exploring Gendered Relationships. *Juvenile and Family Court Journal*, *69*(2), 21–36. https://doi.org/10.1111/jfcj.12110

Wright, K. N., & Wright, K. E. (1994). *Family Life, Delinquency, and Crime: A Policymaker's Guide. Research Summary*. Juvenile Justice Clearinghouse, Box 6000, Rockville, MD 20850 (free). https://eric.ed.gov/?id=ED376388

Young, S., Greer, B., & Church, R. (2017). Juvenile delinquency, welfare, justice and therapeutic interventions: a global perspective. *BJPsych Bulletin*, *41*(1), 21–29. https://doi.org/10.1192/pb.bp.115.052274

Yusuf, S. A., Daud, M. N., & Arshat, Z. (2021). Perception on The Role of Parenting Style on Juvenile Delinquency among Adolescents in The Government Remand Homes, Lagos State Nigeria. *International Journal of Academic Research in Business and Social Sciences*, *11*(6), 1425–1441. https://doi.org/10.6007/IJARBSS/v11-i6/10042

Examining the Influence Individualistic Cultural Values has on Rates of Narcissistic Personality Disorder

by Madeline Sinnamon

An individual's "personality" is defined as long-lasting patterns of thinking, connecting with, and understanding oneself and environment (American Psychiatric Association, 2013). Modern Western culture, which values individualism (Markus & Kitayama, 1991), often sees a person's unique personality as something to be proud of. However, a person's personality can lead to disruptions in work, relationships, and other activities of daily living. These disruptions may result in distress for the individual and those around them. When this occurs, the person is described as having a "personality disorder" (Barlow et al., 2021).

According to the American Psychiatric Association (2013), a person diagnosed with a personality disorder experiences a long-lasting pattern of behaviour that differs from what is expected in the individual's culture. The disorder begins in adolescence or young adulthood, leads to dysfunction or distress, and remains fixed over time. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has identified 10 types of personality disorders, divided into three clusters: Cluster A, Cluster B, and Cluster C (American Psychiatric Association, 2013). As outlined by the American Psychiatric Association (APA), Cluster A encompasses schizoid, schizotypal, and paranoid personality disorders, which includes those described as unconventional or strange. Individuals with Cluster B personality disorders are described by the APA as overly emotional, unpredictable, and melodramatic. This includes the borderline, histrionic, antisocial, and narcissistic personality disorders. Finally, Cluster C is comprised of people seen as apprehensive or easily frightened, and includes the avoidant, obsessive-compulsive, and dependent personality disorders (APA, 2013). This essay will focus mainly on narcissistic personality disorder (NPD).

The purpose of this paper is to discuss social psychological influences on NPD; specifically, cultural explanations for the increase in narcissistic personality traits in Western cultures during recent decades. This paper will begin by provid-

ing a general overview of NPD, including diagnostic criteria, symptoms, prevalence rates, possible causes, and available treatment options. Theories on the effects of cultural shifts from collectivist to individualist self-concepts will be discussed, as well as the effects these shifts have on parenting practices and therapeutic options. This paper will also discuss how changes in parenting styles and therapies may have led to increased rates of NPD.

Narcissistic Personality Disorder (NPD): Background Information

The term "narcissism" has its origins in Greek mythology (Jauk et al., 2021). Narcissus was a young man who was so in love with himself that he spent his entire life staring at his reflection in a pool of water (Barlow et al., 2021). Modern definitions of narcissism are not far off from this ancient depiction. Jauk et al. (2021) describe narcissism as a personality trait identified by a sense of entitlement and arrogance. In the case of NPD, the DSM-5 specifies that five or more of the following must be present in order for a patient to qualify for a diagnosis: a heightened sense of self-importance, fantasies of unlimited success or power, a belief they are unique or special, an immoderate need for admiration, entitlement, a need to take advantage of others, a lack of empathy, arrogant behaviour, and envy of others (APA, 2013). The exact cause of NPD is unknown; however, many theories have been proposed. From a biological perspective, genetic studies of NPD (Torgersen et al., 2000) and narcissistic traits (Vernon et al., 2008) show a heritability component of roughly 40% of the total variance. This implies that only 40% of an individual's genetic makeup may play a role in the phenotypic expression of NPD. Environmental influences are also theorized to play a major role in triggering the onset of NPD (Paris, 2014). These environmental triggers will be explored from a social psychological perspective throughout this paper.

In terms of treatment options for NPD, many therapies have been proposed, including cognitive-behavioural therapy, schema therapy, and dialectical behaviour therapy (Campbell & Miller, 2011). Traditional talk therapy is also an option for NPD—the social psychological ramifications of its use in treating NPD will be discussed later in this paper.

Rates of Narcissistic Personality Traits are Changing Over Time

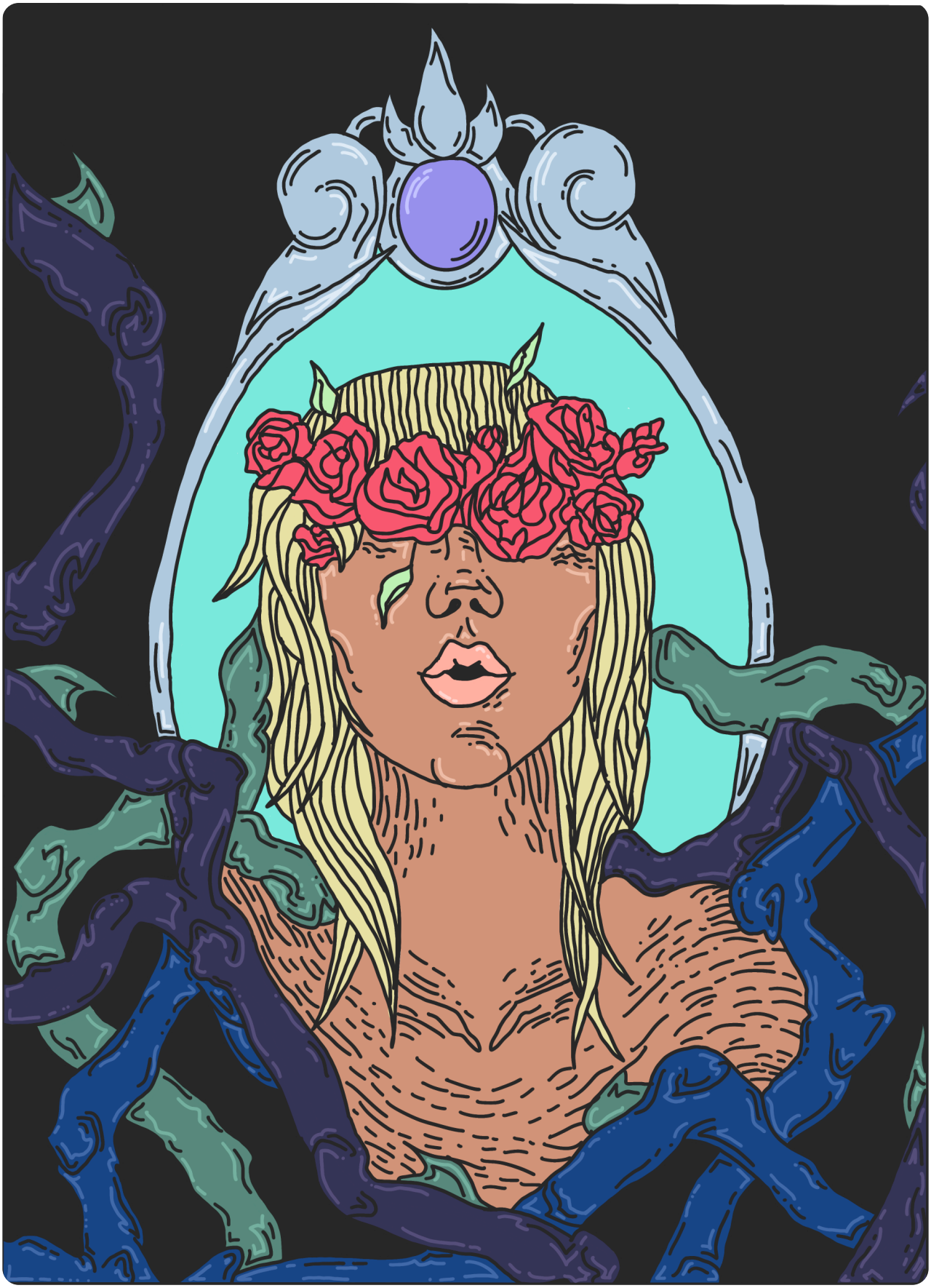
First, it is important to note there are several pieces of evidence suggesting rates of narcissism have recently been on the rise (Twenge & Foster, 2008; Twenge et al., 2008; Westerman et al., 2011). For instance, Twenge and Foster (2008) found the mean score on the Narcissistic Personality Inventory (NPI), a psychometric tool used to determine levels of narcissism, had increased for American college students from 1979–2006. Specifically, Twenge and Foster (2008) found a mean

NPI score of 15.06 in 1982 and a mean NPI score of 17.29 in 2006. In a similar fashion, Westerman and colleagues (2011) found a higher level of narcissism (as measured using the NPI) in Millennial college students. In particular, Westerman and colleagues (2011) found a Millennial mean NPI score of 17.06, which was significantly higher than 8 out of 10 historical mean baseline NPI values calculated in previous studies.

Some scholars argue the rise of individualism in Western culture has created a breeding ground for narcissism (Lasch, 1979). Consequentially, Foster and colleagues (2003) postulated there is a cohort effect—younger generations may be more prone to developing narcissistic traits due to growing up in cultures more focused on individualism. In contrast, older generations who grew up in cultures that valued collectivism were less likely to develop narcissistic traits (Foster et al., 2003). Foster and colleagues (2003) found a negative correlation between levels of narcissism and age; the older the participants were, the more likely they were to exhibit low levels of narcissism, and vice versa. Another study found significant increases in narcissism at an American college from 1982 to 2006 (Twenge et al., 2008). However, it is important to note there may be confounding variables affecting these findings. Though personality is likely to be influenced by the cultural values in which a person is raised, personality may also change as a person ages (Helson et al., 2002). With more life experience, the chance of experiencing failure increases—experiencing failure may lead to greater levels of humility. Also, certain colleges may develop a competitive atmosphere over time that makes levels of narcissism among students higher than in previous years. More longitudinal studies examining levels of narcissistic traits must be completed to determine whether other confounding variables are at play in these findings.

Cultural Products: An Explanation for Higher Rates of Narcissism

Much research has been completed exploring how Western individualistic cultural values may exacerbate narcissistic personality traits. It has been theorized that individuals and culture interact with each other in a cycle, with culture influencing an individual's personality and vice versa (Markus & Kitayama, 1994). Based on this theory, changing cultural products over time may influence shifts in personality traits, like narcissism. DeWall and colleagues (2011) analyzed word choice in popular American songs from 1980 to 2007. They found a greater use of terms related to antisocial behaviour and a focus on the self in modern songs. Specifically, first-person singular pronouns that express self-focus, such as "me," "mine," and "I," were found by DeWall and colleagues (2011) to increase in popular song lyrics from 1980 to 2007. Words that convey antisocial behaviour,



art by alyssa georgescu

like "kill," "damn," and "hate," were also found to increase. Additionally, modern songs were found to contain less words related to focusing on others and prosocial behaviour compared to older songs. In particular, DeWall and colleagues (2011) found that first-person plural pronouns related to social cohesion, such as "us," "our," and "we," decreased significantly between 1980 and 2007. Another study, by Nafstad and colleagues (2007), analyzed word choice in a popular Norway newspaper. They found, from 1984 to 2005, the use of more individualist words, including "I" and "me," increased by 69%, whereas more collectivist terms, like "social cohesion" and "duty," decreased by 32%. These studies suggest, based on Markus and Kitayama's 1994 theory, Western cultural products have shifted towards a greater emphasis on individualism, which may be influencing the development of narcissistic personality traits in those growing up in modern Western cultures.

Prevalence Rates of Narcissism Cross-Culturally

If greater emphasis on individualism is to blame for higher rates of narcissism, it may also be expected that rates of narcissism vary cross-culturally. Cultures that value the group, as opposed to the individual, would be expected to show lower rates of narcissism. Foster and colleagues (2003) found that people from the U.S. scored higher on the NPI compared to those from the Middle East and Asia. However, the number of non-American participants was small, including only 899 non-American participants compared to 2546 Americans. This may have resulted because the survey was posted exclusively in English, meaning only English-speaking individuals could have completed the assessment. This study provides further evidence that narcissistic tendencies are influenced by shifts towards a greater emphasis on individualism in Western culture, as suggested by the fact non-Western, more collectivistic cultures, like those in Asia and the Middle East, were found to have lower rates of narcissism.

Culture, Prevalence of Narcissism, and the Role of Parenting

Western cultures' growing shift towards individualism is also likely to have impacted parenting styles. Parent's child-rearing practices and choices are expected to influence the level of narcissistic personality traits their children will develop. For instance, Twenge and colleagues (2010) examined the names U.S. parents gave their children born between 1880 and 2007. It was found that, in the 1940s, 30–40% of boys received one of the 10 most common names; however, by 2007, less than 10% of baby boys received a common name (Twenge et al., 2010). This suggests that American parents have begun favouring more unique names to help their children stand out, suggesting a bias towards promoting individualism in

their children. These findings are possibly a result of Western culture's shift towards a focus on the self. This trend towards favouring more unique names has also been found in countries considered more collectivistic, such as Japan (Ogihara et al., 2015) and China (Cai et al., 2018). Ogihara and colleagues (2015) have suggested this increase in unique names in collectivist-oriented countries may be due to the globalization of American values, such as individualism, across the world. Future studies should gather more data on rates of unique and common names in other collectivistic countries, such as Korea and India, to further validate the finding that rates of unique names in these areas are also increasing.

Other child-rearing practices have also been suggested to increase narcissism. A study by Watson and colleagues (1992) found a positive correlation between parental permissiveness and the development of narcissistic personality traits in these parents' children. In a similar manner, Otway and Vignoles (2006) found a positive correlation between excessive admiration by parents and their children's subsequent NPI and Hypersensitive Narcissism Scale (HSNS) test scores. Although correlation does not always imply causation, it has been theorized that children learn appropriate social behaviours by observing and imitating the actions of those around them (Bandura, 1977). Therefore, children may be taught they are somehow "better" than others if they have parents or guardians who practice parental permissiveness and excessive admiration when raising their children. This may subsequently lead to the development of behaviours in the child that are indicative of NPD. These findings suggest parenting styles that include parental permissiveness and excessive admiration may play a role in the development of narcissistic traits in children. Moving forward, studies should be conducted to explore if Western cultural shifts towards individualism play a role in promoting these parenting styles.

Psychotherapy and Narcissism

Some scholars have suggested treatment options for NPD exacerbate the symptoms of the disorder instead of reducing them. Specifically, psychotherapy has been criticized for fueling narcissistic tendencies by encouraging the patient to focus on themselves as opposed to others (Paris, 2014). Paris (2014) suggests psychotherapy is a product of Western society's shift towards more individualistic tendencies. Patients with NPD that meet with a therapist who encourages the person to talk about themselves may be susceptible to their narcissism being reinforced—this is because an excessive focus on oneself is a core symptom of NPD. At present, there is minimal research being conducted that explores whether psychotherapies are effective in the treatment of NPD (Paris, 2014). Future studies should test whether or not psychotherapies ac-

tually help NPD patients manage their symptoms. This will help determine if other forms of therapy should be developed and tested that are specifically tailored towards helping those diagnosed with NPD.

Conclusion

In conclusion, Western society's shift in focus towards the individual has impacted rates of NPD over the past few decades. This is apparent when considering the rising rates of Western cultural products that promote individualism, as well as changes in parenting styles and mental health treatments. Moving forward, more research needs to be conducted to explore treatment options for people diagnosed with NPD that promote the development of more collectivistic traits.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, N.J. Prentice-Hall.

Barlow, D. H., Durand, V. M., Hofmann, S. G., & Lalumière, M. L. (2021). *Abnormal psychology: An integrative approach* (6th Canadian ed.). Nelson Education Ltd.

Cai, H., Zou, X., Feng, Y., Liu, Y., & Jing, Y. (2018). Increasing need for uniqueness in contemporary China: Empirical evidence. *Frontiers in Psychology*, *9*, Article 554. https://doi.org/10.3389/fpsyg.2018.00554

Campbell, W. K., & Miller, J. D. (2011). *The handbook of narcissism and narcissistic personality disorder: Theoretical approaches, empirical findings, and treatments*. John Wiley & Sons.

DeWall, C. N., Pond, R. S., Campbell, W. K., & Twenge, J. M. (2011). Tuning in to psychological change: Linguistic markers of psychological traits and emotions over time in popular U.S. song lyrics. *Psychology of Aesthetics, Creativity, and the Arts*, *5*(3), 200–207. https://doi.org/10.1037/a0023195

Dhawan, N., Kunik, M. E., Oldham, J., & Coverdale, J. (2010). Prevalence and treatment of narcissistic personality disorder in the community: A systematic review. *Comprehensive Psychiatry*, *51*(4), 333–339. https://doi.org/10.1016/j.comppsych.2009.09.003

Foster, J. D., Campbell, W. K., & Twenge, J. M. (2003). Individual differences in narcissism: Inflated self-views across the lifespan and around the world. *Journal of Research in Personality*, *37*(6), 469–486. https://doi.org/10.1016/s0092-6566(03)00026-6

Helson, R., Kwan, V. S. Y., John, O. P., & Jones, C. (2002). The growing evidence for personality change in adulthood: Findings from research with personality inventories. *Journal of Research in Personality*, *36*(4), 287–306. https://doi.org/10.1016/s0092-6566(02)00010-7

Jauk, E., Breyer, D., Kanske, P., & Wakabayashi, A. (2021). Narcissism in independent and interdependent cultures. *Personality and Individual Differences*, *177*, 110716. https://doi.org/10.1016/j.paid.2021.110716

Lasch, C. (1979). The culture of narcissism: *American life in an age of diminishing expectations*. Norton.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*(2), 224–253. https://doi.org/10.1037/0033-295x.98.2.224

Markus, H. R., & Kitayama, S. (1994). A collective fear of the collective: Implications for selves and theories of selves. *Personality and Social Psychology Bulletin*, *20*(5), 568–579. https://doi.org/10.1177/0146167294205013

Nafstad, H. E., Blakar, R. M., Carlquist, E., Phelps, J. M., & Rand-Hendriksen, K. (2007). Ideology and power: The influence of current neo-liberalism in society. *Journal of Community & Applied Social Psychology*, *17*(4), 313–327. https://doi.org/10.1002/casp.931

Ogihara, Y., Fujita, H., Tominaga, H., Ishigaki, S., Kashimoto, T., Takahashi, A., Toyohara, K., & Uchida, Y. (2015). Are common names becoming less common? The rise in uniqueness and individualism in Japan. *Frontiers in Psychology*, *6*, Article 1490. https://doi.org/10.3389/fpsyg.2015.01490

Otway, L. J., & Vignoles, V. L. (2006). Narcissism and childhood recollections: A quantitative test of psychoanalytic predictions. *Personality and Social Psychology Bulletin, 32*(1), 104–116. https://doi.org/10.1177/0146167205279907

Paris, J. (2014). Modernity and narcissistic personality disorder. *Personality Disorders: Theory, Research, and Treatment*, *5*(2), 220–226. https://doi.org/10.1037/a0028580

Torgersen, S., Lygren, S., Øien, P. A., Skre, I., Onstad, S., Edvardsen, J., Tambs, K., & Kringlen, E. (2000). A twin study of personality disorders. *Comprehensive Psychiatry*, *41*(6), 416–425. https://doi.org/10.1053/comp.2000.16560

Twenge, J. M., Abebe, E. M., & Campbell, W. K. (2010). Fitting in or standing out: Trends in American parents' choices for children's names, 1880–2007. *Social Psychological and Personality Science*, *1*(1), 19–25. https://doi.org/10.1177/1948550609349515

Twenge, J. M., & Foster, J. D. (2008). Mapping the scale of the narcissism epidemic: Increases in narcissism 2002–2007 within ethnic groups. *Journal of Research in Personality*, *42*(6), 1619–1622. https://doi.org/10.1016/j.jrp.2008.06.014

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008). Egos inflating over time: A cross-temporal meta-analysis of the Narcissistic Personality Inventory. *Journal of Personality*, *76*(4), 875–902. https://doi.org/10.1111/j.1467-6494.2008.00507.x

Vernon, P. A., Villani, V. C., Vickers, L. C., & Harris, J. A. (2008). A behavioral genetic investigation of the dark triad and the big 5. *Personality and Individual Differences*, *44*(2), 445–452. https://doi.org/10.1016/j.paid.2007.09.007

Watson, P. J., Little, T., & Biderman, M. D. (1992). Narcissism and parenting styles. *Psychoanalytic Psychology*, *9*(2), 231–244. https://doi.org/10.1037/h0079344

Westerman, J. W., Bergman, J. Z., Bergman, S. M., & Daly, J. P. (2011). Are universities creating millennial narcissistic employees? An empirical examination of narcissism in business students and its implications. *Journal of Management Education*, *36*(1), 5–32. https://doi.org/10.1177/1052562911408097

The Problem with Falling in Love Too Fast

by Timur Begaliyev

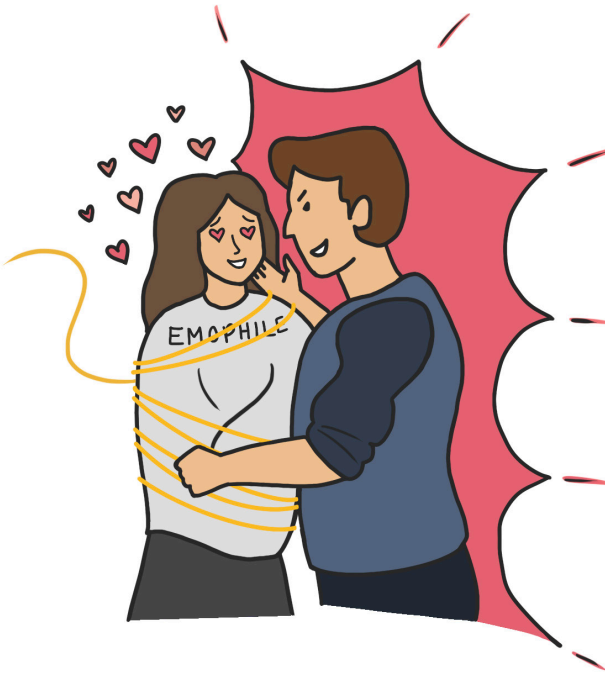
"But I have always loved you, and if one loves anyone, one loves the whole person, just as they are, and not as one would like them to be"
(Tolstoy, 1978, p.580)

Love has long remained the subject of authors and poets. Love has such a powerful effect on the brain — love is literally addictive (Earp et al., 2017). Long-term romantic relationships, which often sustain love for a prolonged period, change brain structure and increase life satisfaction (Kawamichi et al., 2016). However, the benefits of long-term romantic relationships can only be sustained when the romantic couple stays together — quickly falling in love and out of love is not conducive to healthy relationships. One condition, emophilia, is the tendency to repeatedly fall in love quickly and often with different people (Lechuga & Jones, 2021). Those high in emophilia (referred to henceforth as "emophiles") struggle with forming healthy long-term romantic relationships.

Emophiles Commit to Relationships too Fast

Emophiles hastily commit to long-term romantic relationships. For example, emophiles are likely to have more children and get married at an earlier age (Jones, 2015). Individuals who get married earlier experience more difficulties in achieving their educational and career goals (Johnson et al., 2017). Without fulfilling personal goals, individuals have less accomplishments to relate to their self-identity. Furthermore, hastily jumping into relationships only destabilizes self-identity further, as people tend to become more like their partner (Aron et al., 1996). Individuals with an unstable self-identity are more likely to pick a partner that they are incongruent with, which likely contributes to increased divorce rates in emophiles (Jones, 2015). Upon divorce, people are likely to lose their self-identity as a husband or wife, leading to emotional distress (Aron et al., 1996). Emophiles' premature commitment to romantic partners leads to unfavourable life events and decreases self-identity.

Emophiles are Not Skeptical of New Partners



art by kaitlyn mah

Emophiles have less skepticism about the emotionally abusive qualities of romantic partners. According to the "mere-exposure effect", people prefer the familiar over the unfamiliar (Zajonc, 1968). This mechanism of liking familiarity extends from works of art (Maslow, 1937) to other people's faces (Kniffin & Wilson, 2004). For example, women find familiar men consistently more physically attractive (Kniffin & Wilson, 2004). As such, most relationships will form from already trusted friendships (Stinson et al., 2022). Whereas most healthy romantic relationships are formed because two people are familiar with one another, emophiles form romantic relationships because they enjoy a novel romantic experience (Jones & Curtis, 2017). Emophiles will tunnel vision on the romantic novelty factor, causing them to disregard negative qualities about a potential romantic partner. Once at the beginning of a relationship, emophiles are more likely to tolerate early abusive behaviours presented by their partners (Lechuga & Jones, 2021). Emophiles' lack of apprehension of potential romantic partners makes them less likely to engage in healthy relationships.

Emophiles are More Likely to be Victims of Emotionally Abusive Partners

Emophiles are likely to hastily commit to romantic relationships with emotionally abusive partners. Narcissistic and psychopathic behaviours are tolerated more by emophiles than the general population (Lechuga & Jones, 2021). As such, it is likely that narcissists and individuals high in psychopathy engage in romantic relationships at disproportionately large rates with emophiles. Emotionally abusive behaviours, including narcissistic and psychopathic behaviours, gradually leak into the relationship over time; it is difficult to predict abusive behaviours in the early months of dating (Frothingham, 2022). Furthermore, emophiles that are romantically single are likely to be younger and more naive (Jones, 2015), making them more likely to be victims of

abusive behaviours. Leaving an abusive relationship is substantially tougher once one is committed by marriage, children, pregnancy and finances.

By having less skepticism about romantic partners and a tendency to overcommit early to romantic partners, emophiles are also at risk of committing to emotionally abusive partners.

Conclusion

Emophilia is a new topic that has a strong need for applicable mental health treatment methods to be researched. Emophiles are likely to be impacted by the romanticization of love more strongly, as emophiles are prone to falling in love with narcissists and individuals high in psychopathy. Further research can explore the effectiveness of different forms of therapy that helps emophiles develop a healthy skepticism of romantic partners before hastily committing to an abusive, long-term relationship.

References

Aron, A., & Aron, E. N. (1996). Self and self-expansion in relationships. *Knowledge structures in close relationships: A social psychological approach*, 325–344.

Earp, B. D., Wudarczyk, O. A., Foddy, B., & Savulescu, J. (2017). Addicted to love: What is love addiction and when should it be treated? *Philosophy, Psychiatry, & Psychology*, *24*(1), 77–92. https://doi-org/10.1353/ppp.2017.0011

Frothingham, M.B. (2022). *Dark triad personality traits*. Simply Psychology. www.simplypsychology.org/dark-triad-personality.html

Kawamichi, H., Sugawara, S. K., Hamano, Y. H., Makita, K., Matsunaga, M., Tanabe, H. C., Ogino, Y., Saito, S., & Sadato, N. (2016). Being in a romantic relationship is associated with reduced gray matter density in the striatum and increased subjective happiness. *Frontiers in Psychology*, *7*. https://doi-org/10.3389/fpsyg.2016.01763

Johnson, M. D., Krahn, H. J., & Galambos, N. L. (2017). Better late than early: Marital timing and subjective well-being in midlife. *Journal of Family Psychology*, *31*(5), 635–641. https://doi-org /10.1037/fam0000297

Jones, D. N. (2015). Life outcomes and relationship dispositions: The unique role of emophilia. *Personality and Individual Differences*, *82*, 153–157. http://doi.org/10.1016/j.paid.2015.03.024

Jones, D. N. (2017). Establishing the distinctiveness of relationship variables using the big five and self-esteem. *Personality and Individual Differences*, *104*, 393–396. http://doi.org/10.1016/j.paid.2016.08.025

Jones, D. N., & Curtis, S. R. (2017). Emophilia, sociosexuality, and anxious attachment: Approach and inhibition differences. *Personality and Individual Differences*, *106*, 325–328.

Kniffin, K. M., & Wilson, D. S. (2004). The effect of nonphysical traits on the perception of physical attractiveness: Three naturalistic studies. *Evolution and Human Behavior*, *25*(2), 88–101. https://doi-org/10.1016/S1090-5138(04)00006-6

Lechuga, J., & Jones, D. N. (2021). Emophilia and other predictors of attraction to individuals with dark triad traits. *Personality and Individual Difference*, *168*, 110318. https://doi-org./10.1016/j.paid.2020.110318

Maslow, A. H. (1937). The influence of familiarization on preference. *Journal of Experimental Psychology*, *21*(2), 162–180. https://doi-org /10.1037/h0053692

Stinson, D. A., Cameron, J. J., & Hoplock, L. B. (2022). The friends-to-lovers pathway to romance: Prevalent, preferred, and overlooked by science. *Social Psychological and Personality Science*, *13*(2), 562–571. https://doi.org/10.1177/19485506211026992

Tolstoy, L., & Garnett, C. B. (1978). *Anna Karenina*. Indianapolis: Bobbs-Merrill.

Zajonc, R. (1968). The attitudinal effects of mere exposure. *Journal of Personality and Social Psychology, Monograph Supplement*, *9*, 1–27.

The Powerful Effect of Music Therapy on Dementia Patients

by Saniya Nagpal

Introduction

Rose, an 80-year-old woman, felt disconnected from others as she barely spoke a syllable, but when asked to sing along, her face brightened, and she was able to sing every word of that song with emotion (Lipe, n.d.). Such stories are not uncommon, as music has been used for medicinal purposes for decades (Babikian et al., 2013). However, only a few people are aware of music's healing powers. According to the American Music Therapy Association (2005), music therapy is a therapeutic approach in which a credentialed professional uses active (singing, playing instruments, improvisation) or passive (listening, lyric analysis) musical interventions to support development, health, and well-being (AMA, n.d). Moreover, it is a non-invasive intervention and a regular activity that most of us engage in, making it beneficial for all ages. Current scientific research suggests that music therapy is highly effective in enhancing patient well-being across multiple disciplines (Li et al., 2021). For instance, music therapy as shown to increased motor functioning, gait speed and balance in Parkinson's patients (Machado Sotomayor et al., 2021), improved social communication in children with ASD (Sharda et al., 2018) and can reduce symptoms of depression, anxiety, and trauma.

For the purpose of this article, only the effect of music therapy for dementia patients will be examined specifically. Dementia involves the progressive decline of behaviour, and cognitive functions, such as memory and speech. These cognitive impairments are associated with deteriorating mental health as dementia patients experience social isolation, agitation, anxiety, and depression (WHO, 2020). Currently, dementia impacts more than 55 million people and is known to be a major reason for stress among family members. Unfortunately, it has no cure, making it an important topic of conversation within the scientific community. However, music therapy offers light at the end of the tunnel as it's shown to effectively reduce or at least manage dementia symptoms.

Basic Philosophy, and Key Concepts of Music Therapy

The core component of music therapy sessions is the client. A session begins with an identification/assessment of the patient's goals which can include spiritual, physical, emotional, social and cognitive domains (Porter et al., 2017). The client's goals, needs, preferences, strengths, back-

ground (including culture, government, economy, social norms) determine the type of music therapy intervention (passive or active method) used during treatment. Active musical interventions including singing, playing instruments, and musical improvisation typically use the eclectic approach where the client takes an active role during the sessions. Thus, the therapist must encourage client participation with instruments, and allow the client to take autonomy in creating music (Tomaino, 2013). To do so, the therapist may engage in emphatic techniques like mirroring (Kim, 2016) where the therapist imitates the musical beats the client plays, providing them with validation for their emotional expression (MacDonald & Wilson, 2014) and encouraging them to take control. This is the resource-oriented philosophy which states that the therapist should emphasize on the client's resources, strengths, and potential more than the client's weaknesses (Rolvsjord, 2010), Secondly, the therapist adopts a collaborative approach with the client to build a strong therapeutic alliance and trust. Hence, client involvement and self-determination are considered crucial for successful therapy outcomes (Rolvsjord, 2014). This can include the client's willingness to explore musical instruments during active music therapy, taking lead during improvisation or consistently completing assigned homework outside of the therapy setting. For passive therapy, it's important for the client to communicate their musical preferences with their therapist as familiar music can evoke positive memories and emotions (Freitas et al., 2018).

art by kaitlyn mah

The Benefits of Music Therapy for Dementia Patients

Music therapy has shown to be highly beneficial for dementia patients as musical abilities remain intact despite cognitive impairment (Petrovsky et al., 2019). This is because music activates both sides of the brain, unlike speech which activates only a specific region. Thus, music can foster social interaction, improving well-being. Musical interventions such as playing instruments allow patients to coordinate musically and communicate with others through gestural cues (Wang, 2021). Singing has also been used in music therapy as an intervention to promote sociability (Lesta et al., 2006). Singing familiar songs during group music therapy demonstrates a 24% increase in the social behaviour of dementia patients, as indicated by an increase in talking, gesturing, smiling and humming (Pollack & Namazi, 1992).

Along with enhancing communication, music therapy can improve mood and emotional well-being. Improvising with a music therapist is a type of social interaction that encourages the patients to create musical pieces of their choice, allowing them to take control and express their emotions freely (Wang, 2021). Through these musical creations, patients gain a sense of identity and build a trusted relationship with the therapist (Wang, 2021). Group music therapy, another intervention, is highly associated with positive emotional expression. Patients report increased verbal participation, self-confidence, acceptance of their diagnosis, and could reconnect with other patients and caregivers (Lee et al., 2017). Social interaction during group music therapy permits verbal communication, distracting patients from their feelings of irritation and aggression, reducing agitation levels (Pedersen et al., 2017). The ability to express emotions with others via music creates a supportive social network for dementia patients. Emotional expression helps patients mitigate the emotional distress they experience due to dementia, improving their mental health (Osman et al., 2016). This is evident from the reduction in stress levels post music sessions indicated by a decrease in a stress hormone known as cortisol (de la Rubia Ortí et al., 2018). While singing allows for verbal expression, improvisation provides patients with a non-verbal medium of expression and freedom of choice (Wang, 2021). Freedom of expression promotes creativity and restores self-esteem in dementia patients, mitigating their depression symptoms (Aldridge, 2000). Overall, music therapy facilitates social interaction and emotional expression, generating a cathartic experience for dementia patients.

Conclusion

Music therapy should be widely implemented in dementia care as it's shown to be a viable treatment for managing dementia symptoms. Through

musical interventions, patients are able to communicate and engage in social interactions. Socialization permits the expression of emotions, resulting in a better sense of identity and acceptance of the patient's diagnosis. Emotional expression via music is a stress reliever, diminishing agitation, anxiety and depression symptoms in dementia patients. The reduction of these symptoms results in an improvement in the mental health of dementia patients, comprising their social and emotional wellness (WHO, 2018). Music therapy is a burgeoning field and should be made more accessible by educating medical practitioners and family caregivers of dementia patients about the merits of music therapy.

Although music has shown to be highly beneficial for a wide spectrum of patients it's important to be aware of the limitations of this approach. As mentioned earlier, music therapists often consider one's cultural background when deciding upon an intervention. However a major limitation is the lack of multicultural training they receive to handle cross-cultural therapeutic alliances. According to the 2019 workforce analysis of the American Music Therapy Association (AMTA), 85% of music therapists are White. Considering these statistics and its historical European roots, music therapy has continued to evolve through a Eurocentric lens, limiting therapists' proficiency when working in cross-cultural settings. Moreover, throughout the treatment process, the client is expected to take control or be vulnerable about their emotions which is a challenging process for many. Hence, it often requires high intrinsic motivation which may be challenging for individuals feeling hopelessness, a common symptom experienced by dementia patients (Alzhiemer's Association, 2023). Lastly, listening to familiar music, song writing or singing may evoke negative emotions or memories instead of positive ones. In some cases, the client may listen to specific lyrics and experience an intense trigger of emotions due to the unconscious thoughts evoked by music, leading to sadness and overwhelm in the short-term (Kawakami et al., 2014). Thus, it's crucial for therapist to be cognizant of these limitations. Perhaps combining music therapy along with multicultural therapy or motivational therapy is a potential solution to create an optimum treatment plan for dementia patients.

References

A Descriptive, Statistical Profile of the 2019 AMTA Membership and Music Therapy Community. (2019). https://www.musictherapy.org/assets/1/7/2019WorkforceAnalysis.pdf

Aldridge, D. (2000). *Music therapy in dementia care: More new voices*. London: Jessica Kingsley.

Alzheimer's Association. (2023). *Depression*. Alzheimer's Disease and Dementia. Retrieved January 16, 2023, from https://www.alz.org/help-support/caregiving/stages-behaviors/depression

American music Therapy association. (n.d.). https://www.musictherapy.org/about/musictherapy/

Babikian, T., Zeltzer, L., Tachdjian, V., Henry, L., Javanfard, E., Tucci, L., … Tachdjian, R. (2013). Music as medicine: A review and historical perspective. *Alternative and Complementary Therapies*, *19*(5), 251–254. https://doi.org/10.1089/act.2013.19510

De la Rubia Ortí, J. E., García-Pardo, M. P., Iranzo, C. C., Madrigal, J. J., Castillo, S. S., Rochina, M. J., & Gascó, V. J. (2018). Does music therapy improve anxiety and depression in alzheimer's patients? *The Journal of Alternative and Complementary Medicine*, *24*(1), 33-36. https://doi.org/10.1089/acm.2016.0346

Dementia. (2020, September 21). https://www.who.int/news-room/fact-sheets/detail/dementia.

Freitas, C., Manzato, E., Burini, A., Taylor, M., Lerch, J., & Anagnostou, E. (2018). Neural correlates of familiarity in music listening: A systematic review and a neuroimaging meta-analysis. *Frontiers in Neuroscience*, *12*. https://doi.org/10.3389/fnins.2018.00686

Kawakami, A., Furukawa, K., & Okanoya, K. (2014). Music evokes vicarious emotions in listeners. *Frontiers in Psychology*, *5*. https://doi.org/10.3389/fpsyg.2014.00431

Kim, J. (2016). Psychodynamic music therapy. *Voices: A World Forum for Music Therapy*, *16*(2). https://doi.org/10.15845/voices.v16i2.882

Lee, K. H., Boltz, M., Lee, H., & Algase, D. L. (2017). Does social interaction matter psychological well-being in persons with dementia? *American Journal of Alzheimer's Disease & Other Dementias*, *32*(4), 207–-212. https://doi.org/10.1177/1533317517704301

Li, K., Weng, L., & Wang, X. (2021). The State of Music Therapy Studies in the past 20 years: A Bibliometric analysis. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.697726

Lipe, A. (n.d.). *Music Therapy in Alzheimer's Disease*. https://www.musictherapy.org/about/personal_stories/

MacDonald, R. A. R., & Wilson, G. B. (2014). Musical Improvisation and Health: A Review. *Psychology of Well-Being*, *4*(1). https://doi.org/10.1186/s13612-014-0020-9

Machado Sotomayor, M. J., Arufe-Giráldez, V., Ruíz-Rico, G., & Navarro-Patón, R. (2021). Music therapy and parkinson's disease: A systematic review from 2015–2020. *International Journal of Environmental Research and Public Health*, *18*(21), 11618. https://doi.org/10.3390/ijerph182111618

Mental health: Strengthening our response. (2018, March 30). https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

Osman, S. E., Tischler, V., & Schneider, J. (2016). 'Singing for the brain': A qualitative study exploring the health and well-being benefits of singing for people with dementia and their carers. *Dementia*, *15*(6), 1326–1339. https://doi.org/10.1177/1471301214556291

Pedersen, S. K., Andersen, P. N., Lugo, R. G., Andreassen, M., & Sütterlin, S. (2017). Effects of music on agitation in dementia: A meta-analysis. *Frontiers in Psychology*, *8*. https://doi.org/10.3389/fpsyg.2017.00742

Petrovsky, D. V., Johnson, J. K., Tkacs, N., Mechanic-Hamilton, D., Hamilton, R. H., & Cacchione, P. Z. (2019). Musical and Cognitive Abilities in Older Adults with Mild Cognitive Impairment. *Psychology of music*, *2019*, 10.1177/0305735619843993. *https://doi.org/10.1177/0305735619843993*

Porter, S., McConnell, T., Clarke, M., Kirkwood, J., Hughes, N., Graham-Wisener, L., Regan, J., McKeown, M., McGrillen, K., & Reid, J. (2017). A critical realist evaluation of a music therapy intervention in Palliative Care. *BMC Palliative Care*, *16*(1). https://doi.org/10.1186/s12904-017-0253-5

Rolvsjord, R. (2010). *Resource-oriented music therapy in Mental Health Care*. Barcelona Pub.

Rolvsjord, R. (2014). What clients do to make music therapy work: A qualitative multiple case study in adult mental health care. *Nordic Journal of Music Therapy*, *24*(4), 296–321. https://doi.org/10.1080/08098131.2014.964753

Sharda, M., Tuerk, C., Chowdhury, R., Jamey, K., Foster, N., Custo-Blanch, M., Tan, M., Nadig, A., & Hyde, K. (2018). Music improves social communication and auditory–motor connectivity in children with autism. *Translational Psychiatry*, *8*(1). https://doi.org/10.1038/s41398-018-0287-3

Tomaino, C. M. (2013). Creativity and improvisation as therapeutic tools within music therapy. *Annals of the New York Academy of Sciences*, *1303*(1), 84-86. https://doi.org/10.1111/nyas.12224

art by alyssa georgescu

Wundt's Prophecy

Examining Wilhelm Wundt's Vision for the Trajectory of Psychology as a Science

by Parham Seyedmazhari

When reviewing the history of psychology, it is impossible to overlook the impact of Wilhelm Wundt, a German psychologist, on the field. He is often referred to as the father of modern psychology and for good reason: Wundt wrote extensively about his efforts to make psychology a field of science, as opposed to a philosophy. He formalized a dualistic approach to the scientific study of psychology: one approach was through the quantitative, empirical observations of psychological phenomena (say, recording reaction time to different stimuli), and the other through qualitative observations of culture, linguistics, and mythology, integrating these broader, phenomenological observations into scientific theory (Danziger, 1983; Kroger & Scheibe, 1990). He termed the qualitative approach völkerpsychologie,

roughly translating to "cultural psychology", and believed so strongly in the importance of it that he dedicated the rest of his life to progressing this field (Danziger, 1983). But only one of these two proposed approaches to psychology gained popular attention, that being his quantitative, experimental approach to psychology (indeed, Wundt is known popularly as the father of experimental psychology). Notably, virtually none of Wundt's ideas regarding völkerpsychologie found an interest in the field of psychology at the time and, so, were lost (Kroger & Scheibe, 1990). Here we examine why Wundt's völkerpsychologie went completely unnoticed in the field and how, despite all, his dualistic approach to psychology has proven to be prophetic in the 21st century.

Nonconformity with Individualism

By the beginning of the 20th century, psychology had moved on from its European roots and found itself a new home in the flourishing United States of America. America was a newly founded country, built on the shoulders of immigrants from all over the globe who chose to put their culture aside and start anew. This was the rise of American individualism. As a belief, individualism stresses the significance of each individual, the self, ahead of any other entity in the world whether it be the government, other groups, and especially, culture. Compatible and supportive to this individualism was behaviourism, the loudest voice, and the most dominant field within the new, American, psychology. Behaviourism indeed empowered the individual by giving scientific backing to the stoic idea that one can turn their mind (and lives) around through its basic principles of learning and adjusting behaviour. Furthermore, behaviourism proved highly scientifically productive, managing to yield a plethora of solid experimental results, some of which are discussed in psychology courses to this day.

Given the success of behaviourism and psychology in America, it was clear that any psychological theories form Europe needed to be heard in the United States or be forgotten. The crux, however, was that völkerpsychologie and behaviourism proved completely incompatible. One notable point of disagreement between the two schools was rooted in each's approach to scientific methodology. Whereas behaviourism, already a productive and established voice in science, exclusively recognized observable behaviour as valid empirical evidence of psychological processes for their ease of measurement (Kroger & Scheibe, 1990), Wundt's völkerpsychologie regarded voluntary behaviour as irrelevant. Indeed, Wundt thought that unconscious and involuntary forces of the masses make changes to culture, not an individual's thoughts and actions (Danziger, 1983). Needless to say, Wundt's approach did not appeal to the dominant voices in science,

and instead it was seen as "mysticism" to scientists born in an individualist setting. (Danziger, 1983). Individualism indeed proved incompatible with Völkerpsychologie, as this American rebellion against culture made Wundt's culture-centred approach to psychology rather irrelevant (Danziger, 1983). Völkerpsychologie held cultural and linguistic observations at the same level of empirical value as experimental studies while managing to disregard the individual as a psychological area of focus (Danziger, 1983). The individualism of the American zeitgeist was resistant to völkerpsychologie's idea of the individual's irrelevance when it came to cultural movement.

Lost in Translation…

The above problems would perhaps have been avoidable if Wundt's ideas were publicly accessible, so that every scientist and thinker could read and form their own opinions about them. However, because Wundt's work was only available in Deutsch, his native tongue, English-speaking Americans had very limited access to his work. One of Wundt's apprentices, Titchener, took the task of translating his work to English (Kroger & Scheibe, 1990). Titchener realized the ideological conflict between Wundt's methods and the American zeitgeist. He decided that in order to be accepted in America, Wundt's ideas needed to conform to behaviourism. Accordingly, Titchener reframed experimental psychology, the first of Wundt's two methods of conducting psychological research, to be the focus of Wundt's work (Kroger & Scheibe, 1990). He further reduced Völkerpsychologie to represent an outline of "social psychology": the study of observable human behaviour in the presence of others (Kroger & Scheibe, 1990). As a result of this conformity to behaviourism, Wundt became known as the father of experimental psychology. Wundt's rich view of cultural influence in psychology was translated into running experiments on humans to see how they act in social situations. Titchener thus managed to conform völkerpsychologie into behaviourism by entirely modifying its fundamental assumptions and methodologies. Titchener helped emigrate Wundt's ideas but at the great cost of losing half of them in translation.

Völkerpsychologie Reincarnate

One century has passed since the death of Wilhelm Wundt, and the once individualistic, American psychology finds itself changing from the days of behaviourism. Although a productive and powerful scientific approach, behaviourism proved highly reductive when it came to explaining human thoughts and behaviours and was set aside as a result. Many movements in psychology came and went in these 100 years; since the late 20th century, postmodernism, a movement aimed at focusing on cultural and subjective perspectives on phenomena

in psychology, has been the mainstream philosophical conformism of psychology (Holzman & Morss, 2000). As if prophetic, Psychology has turned, in Wundt's predicted direction, towards focusing on how cultures differ and how people differ from each other as a result of their cultural context.

One example of such approach is seen in the field of human grief behaviour. Currently, some psychologists examine bereavement behaviour from an evolutionary point of view, assuming such behaviour to be a human universal (Andrews et al., 2021), while others focus their attention to how grief differs in humans across different cultures. Rosenblatt & Nkosi were one group that did such work in 2007. They sought to examine the bereavement patterns of the Zulu tribe in South Africa by passively studying them through semi-structured interviews (Rosenblatt & Nkosi, 2007). The researchers reported that unlike those grieving in Western culture, not all Zulu wives grieve out of missing their husbands and many are more upset about the financial concerns of becoming widowed (Rosenblatt & Nkosi, 2007). The widows were also treated differently by the community, with many tribe members physically distancing themselves as much as possible from the widow (Rosenblatt & Nkosi, 2007). Research findings like this show how modern psychological research aims to capture a cultural dimension of psychology that has been missing so far.

Völkerpsychologie lives on…

There are many anthropological studies similar to the one done by Rosenblatt & Nkosi, that closely align in methodology with the principles of Wundtian völkerpsychologie. The results that these studies yield add a much-needed dimension to the richness of human psychology, by putting general human behaviours, like grief, within a cultural context. The cultural context of human psychology was of great empirical importance to Wundt. It would seem from the recent culture-focused movements in psychology that Wilhelm Wundt's völkerpsychologie was a much-needed approach in this science. The ideas first formalized in Wundt's völkerpsychologie are becoming more relevant and as the field evolves, Wundt's lost ideas seem more and more prophetic. Perhaps Wundt's dualistic approach was ahead of its time, held back by behaviourism. Whatever the case may be, this forgotten piece of the history of psychology outlines how psychology as a scientific field is affected by the zeitgeist, as völkerpsychologie was affected by individualism.

References

Andrews, P. W., Altman, M., Sevcikova, M., & Cacciatore, J. (2021). An evolutionary approach to grief-related rumination: Construction and validation of the Bereavement Analytical Rumination Questionnaire. *Evolution and Human Behavior*, *42*(5), 441–452. https://doi.org/10.1016/j.evolhumbehav.2021.03.007

Danziger, K. (1983). Origins and basic principles of Wundt's Volkerpsychologie. *British Journal of Social Psychology*, *22*, 303–313.

Holzman, L., & Morss, J. R. (2000). *Postmodern Psychologies, Societal Practice, and Political Life*. Psychology Press.

Kroger, R. O., & Scheibe, K. E. (1990). A reappraisal of Wundt's influence on social psychology. *Canadian Psychology / Psychologie canadienne*, *31*(3), 220–228. https://doi.org/10.1037/h0078919

Rosenblatt, P. C., & Nkosi, B. C. (2007). South African Zulu widows in a time of poverty and social change. *Death Studies*, *31*(1), 67–85. https://doi.org/10.1080/07481180600995214

Digital Amnesia

The Cognitive Cost of a Technological Transactive Memory

by Shruthi Raghuraman

The Medium is the Message

Individuals have used a variety of media, from typewriters and theatre to television and text messages, to share information throughout history. "The medium is the message" means that the form of communication shapes how the message is perceived (Sweetland, 2015). The Internet has become a universal medium for many individuals, making it relevant to understand how it shapes the mind. Technology offers an effortless way for quick and easy access to information, but this information dependency comes at a cognitive cost.

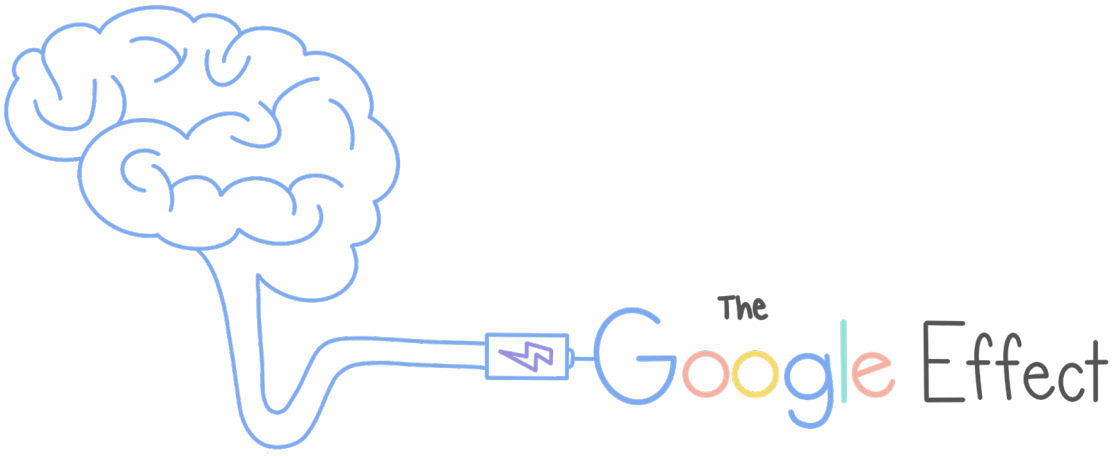
The Google Effect: Cognitive Offloading as a Mechanism of Digital Amnesia

Google has grown to be one of the most popular search engines, with the average individual conducting between three and four searches each day (Prater, 2021). While the Internet has practically no limits to the information it holds, the brain does. The brain's cognitive capacities are limited, meaning it must be selective about the information it chooses to process and remember. To compensate for this limited capacity, Internet users acquire information on an as-needed basis to answer their questions. They ask a question and instantly get a response, but is reading equivalent to understanding? Digital amnesia, or the Google Effect, refers to an individual's tendency to forget information that is easily found using search engines (Heersmink, 2016). Once Internet users know that certain information is easy to access online, their brain does not commit this information to memory. Storm et al. (2016) found that study participants initially using Google to answer challenging trivia questions (for instance, the state where the majority of presidents were born) continued to use it even when responding to comparatively easier questions, like how many zodiac signs there are. Using Google increases future search engine use by conditioning individuals to use Google whenever they encounter a question, regardless of its difficulty. When Storm and Stone (2015) explored whether search engine-provided responses are remembered, they found that study participants who learned that specific information would be available externally put less effort into remembering it internally. Internet users offload information that is no longer a priority to reduce the cognitive load of newly acquired information. For instance, a stu-

dent may type notes during class so that they are not obligated to remember everything, freeing up mental space for future class content. This is achieved through cognitive offloading, and plays a key role in the Google Effect, offering individuals a method to reduce their mental processing of content. Morrison and Richmond (2020) found that at larger memory loads, offloading information has a performance advantage over relying on internal memory. Cognitive offloading appears to be a useful compensatory tool to enhance the performance of memory. However, it is important to not become overly reliant on it, as without remembering the information, Internet users may forget it just as quickly as they obtain it.

Google it and Forget it: The Mind's Retention of Online Information

After being frustrated with job applications from unqualified college students, Thomas Edison developed the Edison Test to assess the intellectual level of potential employees by analyzing their ability to remember information (Blakemore, 2015). Surprisingly, even Albert Einstein failed the Edison test and explained that he finds it pointless to carry around the knowledge that is easily accessible in books, and that the goal of a college education is not to absorb many facts, but to educate the mind to think critically (Storm and Stone, 2015). While memory effectiveness plays a vital role in cognition, strategies like cognitive offloading cannot be overlooked, as they help the mind expand its capabilities. Through shopping lists and photo albums, it is common for individuals to use external resources to remember content with transactive memory. Transactive (or external) memory is group memory in which individuals work together to remember information (Marsh and Rajaram, 2019). One of the earliest studies on transactive memory found that couples use each other as an external memory source (Wegner et al., 1991). Internet users choose to offload



art by kaitlyn mah

information to others instead of storing it themselves, only needing to remember the source of the knowledge. In a transactive memory system, one individual may be better at remembering phone numbers, while the other is better at memorizing directions, reducing the cognitive load of having to remember everything (Cooper, 2014). Information is remembered depending on who is best suited to retain it. Despite being beneficial at a group level, a technological transactive memory, such as the Internet, is not the same as one between two individuals since it is one-sided. The Internet frees users of any need to save information for others or to keep track of where the precise information is externally stored. A brain imaging study investigating the brain mechanisms underlying Internet-based vs. encyclopedia-based searching revealed neural activation differences between ventral and dorsal streams (Firth et al., 2019). The ventral and dorsal streams of the brain are referred to as "what" and "where" streams, respectively, due to their roles in storing either the specific content (ventral stream) or the external location (dorsal stream) of incoming information. Despite no difference in dorsal stream activation, poorer recall of Internet-sought information compared to encyclopedia-based learning was associated with reduced ventral stream activation during online information gathering (Firth et al., 2019). Online information gathering is faster, but it may not recruit brain regions required for long-term information storage, indicating that knowing where to find certain information does not imply remembering it. When an individual forgets this, issues with a technological transactive memory may arise. Through cognitive misattribution, Internet users may mistake externally stored information for internal knowledge. Accessing external knowledge sources causes individuals to underestimate how much they rely on their transactive memory partner. Rather than misattributing the source of their knowledge, they may overestimate how much of the total knowledge is remembered internally (Fisher et al., 2015). When Fisher et al. (2015) explored cognitive misattribution, they found that searching for information online increases self-assessed knowledge because Internet users mistakenly believe they have more knowledge "in the brain." The act of information searching itself creates the illusion of knowledge, making an individual's extent of information dependency worth paying attention to.

The Second Page of Google: The Cognitive Miserliness of the Brain

Internet users often joke that one must be really desperate to visit the second page of Google. Areas of the Internet that fail to capture attention are quickly drowned out in the sea of new information. In contrast, successful advertisements, articles, apps, or anything that manages to capture one's attention, gain traction (Firth et al., 2019). The brain is

a cognitive miser, which means it prefers low-cost processing mechanisms and favours quick, easily accessible information, saving the cognitive resources that would be associated with a more difficult process (Stanovich, 2018). Analytical thinkers perform high-level processing by logically examining information, unlike non-analytical thinkers, who rely on intuition (Barr et al., 2015). A study by Barr et al. (2015) discovered that analytical thinkers with higher cognitive capacities use their phones less than non-analytical thinkers for transactive memory in everyday situations. The difference in phone usage between analytical and non-analytical thinkers was specific to online information searching, indicating that the differences are likely due to the Internet furthering cognitive miserliness among less analytical thinkers (Barr et al., 2015). Internet use is shortening attention spans in a mind that already prefers using shortcuts. Peng et al. (2018) found that Internet use reduces attentional scope because the information is presented differently on the Internet than in books. Individuals are accustomed to thinking about the information presented rather than immediately searching for new information because the content of books is relatively fixed and limited. On the Internet, however, continuous information is provided by hyperlinks, and one typically scans the information quickly and then searches for more, rather than thinking deeply about the original information (Peng et al., 2018). The never-ending stream of prompts and notifications from the Internet encourages individuals to constantly hold divided attention, which reduces their ability to focus on a single task (Firth et al., 2019). The average attention span has dropped from twelve minutes to five minutes, explaining why 32% of consumers abandon slow sites between one and five seconds. A one-second delay in page load results in 11% fewer views, and 60% of viewers stop watching videos after two minutes (Weatherhead, 2014). Cognitive miserliness has not only influenced how one pays attention to content, but it has also changed the way individuals communicate by texting abbreviations and has made skimming the new reading. Recognizing the impact of cognitive miserliness emphasizes the importance of maintaining a productive attention span.

Conclusion

As technology continues to advance, the mind is adapting to it. The Internet has been an influential medium that has fundamentally changed individuals' lives. It is intertwined with education, travel, socializing, commerce, entertainment, and most workplaces. Technology has enabled individuals to study online, advance their careers, and meet new friends or romantic partners. Most importantly, it has changed how information is obtained (Firth et al., 2019). The mind's transactive memory with technology has shifted the way information is received,

remembered, and valued. While the benefits of Internet use come with cognitive costs, Internet users can minimize these consequences by recognizing the extent of their information dependency. Internet users can benefit from having a resource to remember phone numbers, dates, maps and directions, and other similar information as it frees cognitive space for them to focus on more important things. Putting one's mind to work on other things and keeping their brain active can help counteract the effects of digital amnesia.

References

Barr, N., Pennycook, G., Stolz, J. A., & Fugelsang, J. A. (2015). The brain in your pocket: Evidence that Smartphones are used to supplant thinking. *Computers in Human Behavior*, *48*, 473–480. https://doi.org/10.1016/j.chb.2015.02.029

Blakemore, E. (2015, March 13). *Would you pass Thomas Edison's employment test?* Smithsonian.com. Retrieved July 31, 2022, from https://www.smithsonianmag.com/smart-news/would-you-pass-thomas-edisons-employment-test-180954562/

Cooper, B. B. (2014, July 9). *How we store memories in other peoples' heads*. Lifehacker. Retrieved July 31, 2022, from https://lifehacker.com/how-we-store-memories-in-other-peoples-heads-1602512604

Firth, J., Torous, J., Stubbs, B., Firth, J. A., Steiner, G. Z., Smith, L., Alvarez-Jimenez, M., Gleeson, J., Vancampfort, D., Armitage, C. J., & Sarris, J. (2019). The "online brain": How the Internet may be changing our cognition. *World Psychiatry*, *18*(2), 119–129. https://doi.org/10.1002/wps.20617

Fisher, M., Goddu, M. K., & Keil, F. C. (2015). Searching for explanations: How the Internet inflates estimates of internal knowledge. *Journal of Experimental Psychology: General*, *144*(3), 674–687. https://doi.org/10.1037/xge0000070

Heersmink, R. (2016). The Internet, Cognitive Enhancement, and the Values of Cognition. *Minds and Machines*, *26*(4), 389–407. https://doi.org/10.1007/s11023-016-9404-3

Marsh, E. J., & Rajaram, S. (2019). The digital expansion of the mind: Implications of internet usage for memory and cognition. *Journal of Applied Research in Memory and Cognition*, *8*(1), 1–14. https://doi.org/10.1016/j.jarmac.2018.11.001

Morrison, A. B., & Richmond, L. L. (2020). Offloading items from memory: Individual differences in cognitive offloading in a short-term memory task. *Cognitive Research: Principles and Implications*, *5*, 1. https://doi.org/10.1186/s41235-019-0201-4

Peng, M., Chen, X., Zhao, Q., & Zhou, Z. (2018). Attentional scope is reduced by Internet use: A behavior and ERP study. *PLOS ONE*, *13*(6), e0198543. https://doi.org/10.1371/journal.pone.0198543

Prater, M. (2021, June 9). *25 Google Search Statistics to Bookmark ASAP*. HubSpot Blog. Retrieved July 31, 2022, from https://blog.hubspot.com/marketing/google-search-statistics#:~:text=Google%20doesn't%20share%20its,and%20four%20searches%20each%20day

Shelton, K. (2017, November 29). *The Value Of Search Results Rankings. Forbes*. Retrieved July 31, 2022, from https://www.forbes.com/sites/forbesagencycouncil/2017/10/30/the-value-of-search-results-rankings/?sh=69cd9f2c44d3

Stanovich, K. E. (2018). Miserliness in human cognition: The interaction of detection, override and mindware. *Thinking & Reasoning*, *24*(4), 423–444. https://doi.org/10.1080/13546783.2018.1459314

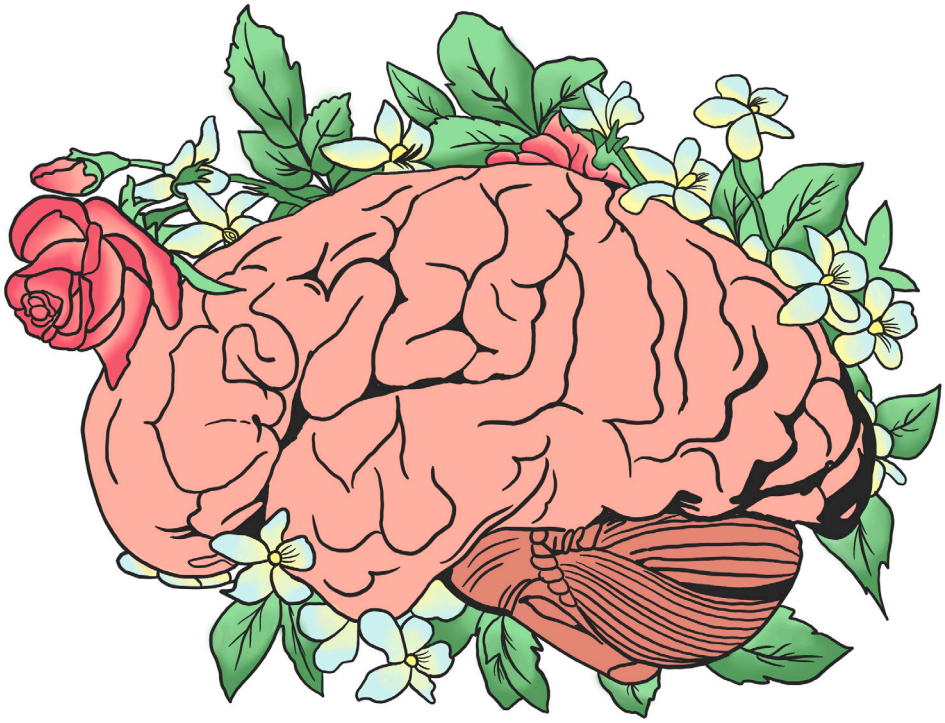
Storm, B. C., & Stone, S. M. (2015). Saving-enhanced memory: The benefits of saving on the learning and remembering of new information. *Psychological Science*, *26*(2), 182–188. https://doi.org/10.1177/0956797614559285

Storm, B. C., Stone, S. M., & Benjamin, A. S. (2017). Using the Internet to access information inflates future use of the Internet to access other information. *Memory*, *25*(6), 717–723. https://doi.org/10.1080/09658211.2016.1210171

Sweetland, G. M. (2015). *"Medium is the Message"*. DigitalRhetoricCollaborative RSS. Retrieved July 31, 2022, from http://webservices.itcs.umich.edu/mediawiki/DigitalRhetoricCollaborative/index.php/%22Medium_is_the_Message%22#cite_ref-book_0-1

Weatherhead, R. (2014, February 28). *Say it quick, say it well – the attention span of a modern internet consumer*. The Guardian. Retrieved July 31, 2022, from https://www.theguardian.com/media-network/media-network-blog/2012/mar/19/attention-span-internet-consumer

Wegner, D. M., Erber, R., & Raymond, P. (1991). Transactive memory in close relationships. *Journal of Personality and Social Psychology*, *61*(6), 923–929. https://doi.org/10.1037//0022-3514.61.6.923



art by alyssa georgescu

CALB1 Expression in the Prefrontal Cortex

by Zeina Elrayes & Noah Smith

Introduction

Several human behaviours differ between individuals, and this variation may stem from differential gene expression in various brain regions. One of the main brain areas affecting behavior is the dorsolateral prefrontal cortex (dlPFC), which plays a role in executive control and higher-level cognitive functioning (Brosnan, & Wiegand, 2017) and closely interacts with the limbic system as it pertains to emotion, behaviour, and memory (Krawczyk, 2002). One of the many genes that affects cellular regulation in the dlPFC is calbindin 1 (CALB1). Calbindin, the protein that CALB1 encodes for, affects the expression and inhibition of several metabolic pathways that impact behaviour and emotion (Krawczyk, 2002). Our study explores how CALB1 expression differs in the dlPFC of males and females. Discovering differences in CALB1 expression in the dlPFC would suggest physiological differences and potential behavioral differences between the sexes.

We know little about the influence of CALB1 on sex differences in regard to phenotypic behavioural variation. While the literature lacks a study of CALB expres-

sion in male and female humans, the available literature looks specifically at differential CALB1 expression in male and female rats (e.g., Harries et al., 2016). Rats are comparable to humans in terms of basic physiology, hormone regulation, nervous system processing, and neurodegenerative pathology (Clancy, 2007). Given the sexual dimorphism of CALB1 expression in rats—females have higher expression than males—we predict that female humans have greater CALB1 expression than male humans. Our analysis seeks to remedy the literature-gap by analyzing CALB1 expression levels between the brains of male and female human subjects.

By studying CALB1 expression in the cortex of the two sexes in humans, we can understand more about its influence on behaviour. The cortex can be functionally divided into 3 distinct areas: (1) the subgranular division, (2) the intergranular division, and (3) the infragranular division (Swenson, 2006). The subgranular division, containing sublayers I-III of the neocortex, facilitates the majority of communication between different brain areas (Swenson, 2006). Here, we analyze the inhibitory neuronal cells of the subgranular division, specifically sublayers II and III of the cortex.

Methods

Tissue Samples and Specimen Processing (Allen Institute for Brain Science)

We used the Allen Brain Atlas website to acquire CALB1 tissue specimens from the dlPFC (Allen Institute for Brain Science, 2012). We excluded samples where the cause of death was suicide, drug overdose, or poisoning in order to maintain an accurate depiction of the quality of the neuronal state in the brain. Control subjects in the database all passed neuropathological exams and showed no history of neuropsychiatric disease (Allen Institute for Brain Science, 2012).

Specimen Selection

The specimen sample is composed of four males (aged 23, 27, 30, 34) and four females (aged 21, 26, 26, and 27). All specimens were non-pathologic controls, non-smokers, right-handed, right-hemisphere only, and from the dorsolateral prefrontal cortex. Race was controlled for as well; the four specimens from each sex included two Black and two White tissue donors.

Statistical rationale and analysis

We conducted an independent-samples t-test on each dataset (two-tailed, assumed unequal variances). Two columns of data were used as comparative values for the t-test. The first column represented male data and the second column represented female data. We extracted the data for each independent sample by taking the average

CALB1 expression frequency of each dlPFC section. For instance, if a 225μm section for each of the four females had cell count values of 8, 7, 9, and 11, respectively, those numbers would be averaged and incorporated into the
'female' column, specifically to the 225μm section. For each comparison, averages from each window section were calculated, and then we conducted a t-test to compare average section values in a specified range. Standard deviation, sample size, and data points are listed in Tables 1 & 2 with the associated p-values from the t-tests.

Two categories of tests were conducted to compare CALB1 expression in regard to sex effects and ethnicity effects. To analyze sex differences, we conducted an independent-samples t-test to compare CALB1 expression between males and females in all layers of the cortex (0-3000μm). To analyze race effects, we ran an independent-samples t-test to compare CALB1 expression between Black and White samples in layers II-III (225-1300μm). Subtests were then conducted to compare race effects on expression within the sexes.

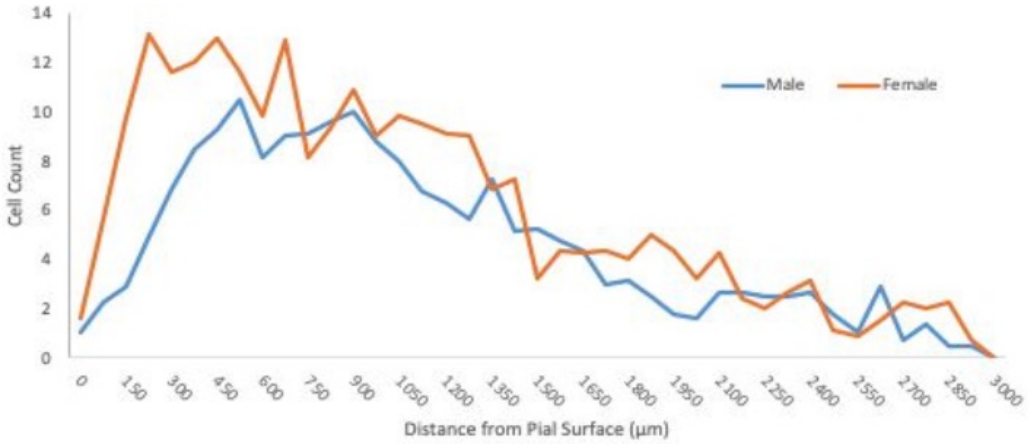
Results

There are three main takeaways from our data: (1) CALB1 is more highly expressed in layers II and III of the dlPFC than in other layers; (2) females have greater CALB1 expression in layers II and III of the dlPFC than males (figure 2a); (3) Black individuals showed greater CALB1 expression than White individuals in layers II-III of the dlPFC (figure 3a).

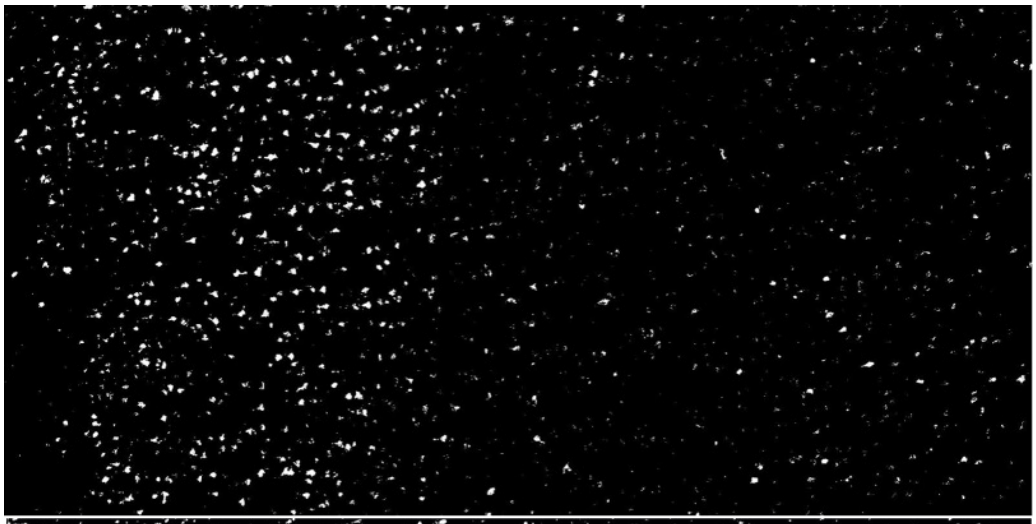
Between-Sex Differences

Figure 2 shows a clear difference in cell density between males and females—this is most pronounced in layers II and III of the neocortex. Figures 2b and 2c, when aligned with figure 2a, show a clear rise and fall in cell density corresponding to the beginning and ends of layer II and III. Both the male and female data lines in Figure 2a peak around 250-550μm, corresponding to layer II, and continue to show high cell density until 1350μm corresponding to the end of layer III. Furthermore, figure 2c, the female specimen, clearly shows a greater number of cells expressing CALB1 than the male specimen in figure 2b. This is in line with the female data line in figure 2a showing a higher density of cells compared to the male data line. In cortical layers II and III (225 to 1350μm), females have 30% more CALB1 expressing cells than males ($p < 0.0005$).

2a.



2b.



2c.

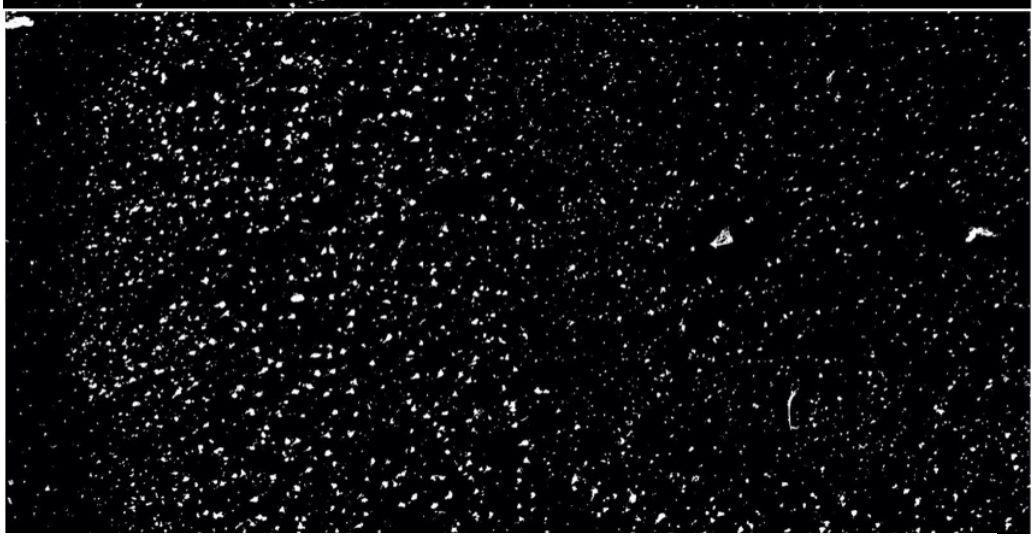


Figure 2. (a) CALB1 expression in male and female specimens as a function of distance from pial surface (µm). (b) Processed image of male specimen (80935572) (c) Processed Image of female specimen (80964576).

Table 1. Statistical Summary of CALB1 Expression Comparisons

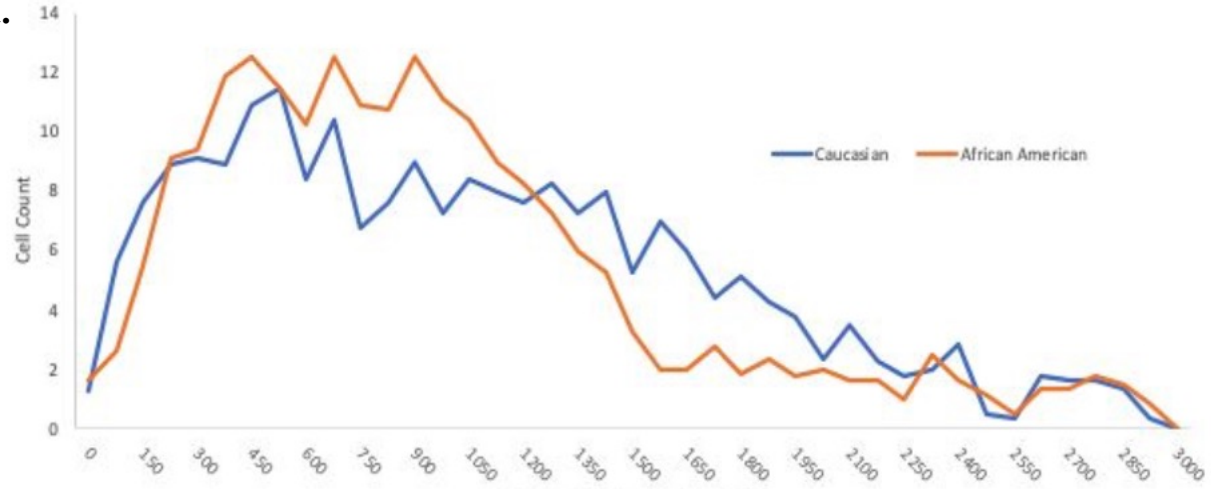
CALB1 Expression Comparisons	Location	Result	P-Value		Standard Deviation(σ)	Sample Size (n)	Data Points
Large vs Small Cells							
	All Layers	S > L	$p < 0.05$	(0.01)	3.70	8	82
	Layers II/III	S > L	$p < 0.005$	(0.002)	2.06	8	30
Males vs Females							
	All Layers	NS	$p > 0.05$	(0.07)	3.68	8	82
	Layer I	NS	$p > 0.05$	(0.259)	3.30	8	6
	Layers II/III	F > M	$p < 0.0005$	(0.0003)	2.08	8	30
	Layers IV/V/VI	NS	$p > 0.05$	(0.34)	1.80	8	46

Abbreviations: S, Small; L, Large; F, Female; M, Male; NS, Not Significant. T-Test analyses were used for all interactions (P<0.05).
Standard Deviation **(σ)** is the total standard deviation between male and females average rolling window values. Sample Size (n) is the total subjects used in the analysis. Data points are the total number of individual average rolling window values used.

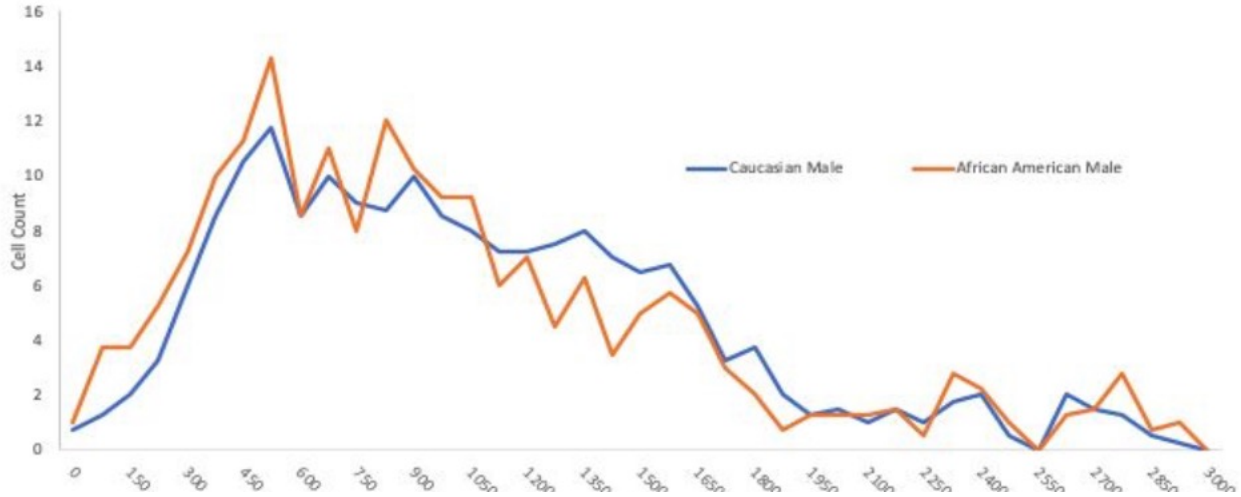
Between-Race Differences

There were also race-dependent differences in CALB1 expression between White and Black specimens. However, these differences were most pronounced between White and Black females. In layers II and III of the dlPFC, Black females had 32% greater CALB1 expression than White females ($p < 0.005$). Differences in CALB1 expression between layers II and III males of different races was non-significant ($p = 0.49$). In our particular sample, there is a significant difference between Black and White specimens, where Black specimens have greater CALB1 expression through layers II and III than White specimens ($p < 0.005$).

3a.



3b.



3c.

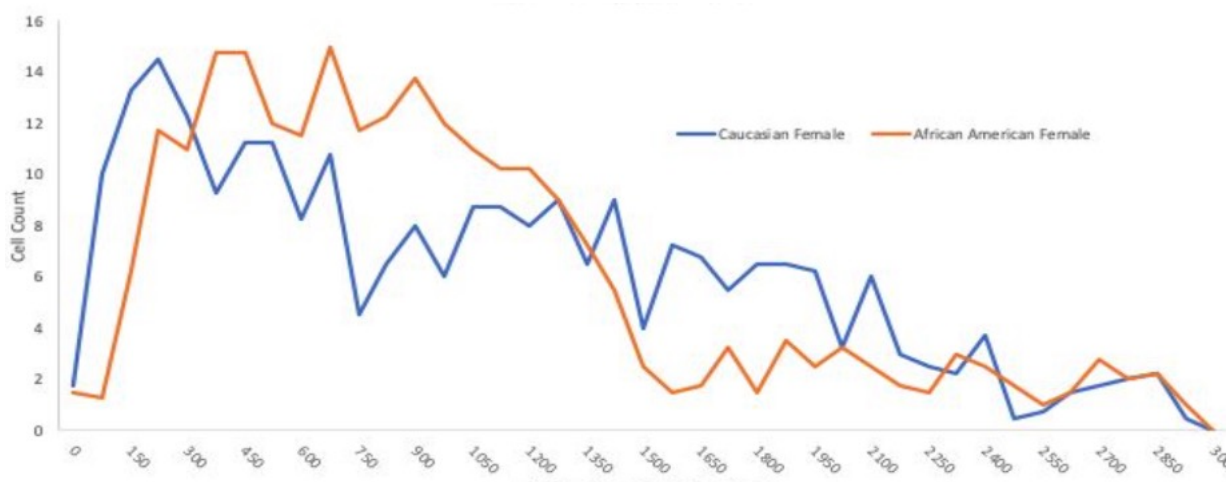


Figure 3. (a) CALB1 expression in Caucasians and African Americans as a function of distance from pial surface **(b)** CALB1 expression in Caucasian and African American males as a function of distance from pial

Discussion

We predicted sexually dimorphic CALB1 expression, specifically higher expression in the female dlPFC than in the male dlPFC. In order to explore the possibility and implications of sexually dimorphic CALB1 expression, we carried out several tests.

Sex-Related Differences

We hypothesized that CALB1 expression would be affected by sex, specifically that it would have higher expression in female subjects in layers II-III of the dlPFC. Upon analyzing the data for layers II-III exclusively, we found a significant difference in CALB1 expression between males and females ($p < 0.0005$). Our results, along with the non-human animal literature (e.g. Harris et al., 2016), suggests that CALB1 expression is sexually dimorphic: females express CALB1 more than males. Given calbindin's role in neuronal inhibition, sexual dimorphism in CALB1 expression could generate myriad impacts on brain function and behavior as a whole. Impacts might include effects on inhibitory processes in the brain, neurotrophic differences, and hormone regulation (Harris et al., 2016). These three processes could affect behaviour and predisposition to disease.

Race-Related Differences

In the selected specimens of this paper, we included two different racial groups in equal proportions to control for the effect of race on sex-related differences. Two White individuals and two Black individuals were included in both male and female groups (Table 2). Figure 3 of our investigation looks at the differences in CALB1 expression between these groups. Figure 3a shows that there are significant differences in CALB1 expression between Black and White specimens ($p < 0.005$). However, given that sex differences already have an impact on CALB1, we conducted a within-sex analysis comparing White and Black individuals. These results are shown in Figures 3b and 3c. Figure 3b shows a large significant difference in CALB1 expression between Black females and White females ($p < 0.005$), while figure 3c shows a non-significant difference between White and Black males ($p > 0.5$). This result was unexpected, and further studies should explore whether there are underlying race-related processes that might also affect CALB1 expression.

Impact of CALB1 on GAD67 Regulation

Higher CALB1 expression leads to greater expression of genes that take part in neuronal inhibition and neuronal nutrition during development. For example, in mice

that lacked CALB1 expression, glutamate-decarboxylase-67 (GAD67) expression was severely decreased (Harris et al., 2016). GAD67 is an enzyme that plays a vital role in converting glutamate to γ-aminobutyric acid (GABA, a neurotransmitter that decreases brain activity). Since CALB1 knockout decreased GAD67 expression, we would expect decreased GAD67 expression to downregulate GABA synthesis. Lower GABA levels have been implicated in behavioral disorders such as anxiety, schizophrenia, and major depressive disorders (Seney et al., 2013). As such, CALB1 expression may play a vital role in mood-altering pathways.

CALB1 downregulation may also predispose some people to disease. Post-mortem tissue samples from the prefrontal cortex of schizophrenic patients indicate that GAD67 expression is highly downregulated in the schizophrenic brain (Guidotti et al., 2000). Given the positive correlation between CALB1 and GAD67 (Harris et al., 2016), downregulated CALB1 may be the cause of downregulated GAD67 in schizophrenic tissue samples. A future investigation should study CALB1 and GAD67 expression in the schizophrenic prefrontal cortex, along with the relation between the two genes. If researchers find a significant correlation between the two, perhaps we will know more about the genetic makeup of schizophrenia in the brain.

Limitations

The largest limitation of this study was its sample size. The Allen Brain Atlas website is a great resource for acquiring in-situ hybridization specimens, so we did our best to select the clearest investigation-relevant images. However, the website has a limited number of high-quality specimens, especially when controlling for multiple factors (e.g., smoker/non-smoker, handedness, age). High quality human brain tissue specimens are scarce, and it would be difficult to conduct a large-scale investigation without hybridizing tissue samples ourselves. Specimen scarcity also made it difficult to control for age; our specimen age range was 20-35 years old.

Conclusion

Gene expression in the brain may play a large role in sexually dimorphic behaviour. Our results suggest that neocortical CALB1 expression is heavily influenced by biological sex. Specifically, the female dlPFC shows higher expression of CALB1 in layers II-III present in small interneuron cells. We speculated that differential CALB1 expression might lead to differential behavioral outcomes in males and females. Further analysis of the brain's dorsolateral prefrontal cortex is necessary to gain an understanding of the influence of CALB1 on other regulatory processes in the body. Overall, this study suggests that differential CALB1 expression could be a major contributor to sexually dimorphic behaviours.

References

Allen Institute for Brain Science. (2012). *Technical White Paper: In Situ Hybridization* [PDF file]. Allen Brain Map.

Brosnan, M. B., & Wiegand, I. (2017). The dorsolateral prefrontal cortex, a dynamic cortical area to enhance top-down attentional control. *Journal of Neuroscience*, 37(13), 3445-3446.

CALB1 calbindin 1 - Gene - NCBI. (2020). Retrieved from https://www.ncbi.nlm.nih.gov/gene/793

Cherubini, E., Gaiarsa, J. L., & Ben-Ari, Y. (1991). GABA: an excitatory transmitter in early postnatal life. *Trends in neurosciences*, *14*(12), 515-519.

Clancy, B., Finlay, B. L., Darlington, R. B., & Anand, K. J. S. (2007). Extrapolating brain development from experimental species to humans. *Neurotoxicology*, *28*(5), 931-937.

DeFelipe, J. (2011). The evolution of the brain, the human nature of cortical circuits, and intellectual creativity. *Frontiers in neuroanatomy*, *5*, 29.

Feldblum, S., Erlander, M. G., & Tobin, A. J. (1993). Different distributions of GAD65 and GAD67 mRNAs suggest that the two glutamate decarboxylases play distinctive functional roles. *Journal of neuroscience research*, *34*(6), 689-706.

Harris, E. P., Abel, J. M., Tejada, L. D., & Rissman, E. F. (2016). Calbindin knockout alters sex-specific regulation of behavior and gene expression in amygdala and prefrontal cortex. *Endocrinology*, *157*(5), 1967-1979.

Karayannis, T., Huerta-Ocampo, I., & Capogna, M. (2007). GABAergic and pyramidal neurons of deep cortical layers directly receive and differently integrate callosal input. *Cerebral Cortex*, *17*(5), 1213-1226.

Krawczyk, D. C. (2002). Contributions of the prefrontal cortex to the neural basis of human decision making. *Neuroscience & Biobehavioral Reviews*, *26*(6), 631-664.

Oldham Lab at UCSF. (2020). *Genes: CALB1 Cell Type Expression Correlates*.

Pinal, C. S., & Tobin, A. J. (1998). Uniqueness and redundancy in GABA production. *Perspectives on developmental neurobiology*, *5*, 109-118.

Seney, M., Chang, L. C., Oh, H., Wang, X., Tseng, G. C., Lewis, D., & Sibille, E. (2013). The role of genetic sex in affect regulation and expression of GABA-related genes across species. *Frontiers in psychiatry*, *4*, 104.

Swenson, R. (2006). The Cerebral Cortex. Retrieved from https://www.dartmouth.edu/~rswenson/NeuroSci/chapter_11.html

Tremblay, Robin et al. "GABAergic Interneurons in the Neocortex: From Cellular Properties to Circuits." *Neuron*, *2*(91) (2016): 260-92. https://doi.org/10.1016/j.neuron.2016.06.033

INFOGRAPHIC

Using ECT to treat maternal psychosis

What is Postpartum Psychosis?

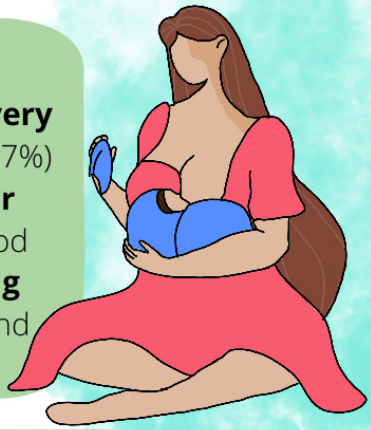
Postpartum psychosis is a **psychiatric condition** that has a rapid onset. **Symptoms** include delusions, mood swings, and disorganized behaviour. Psychosis **threatens the life of the mother and the newborn(s)** (Babu & Chandra, 2013).

What is Electroconvulsive Therapy? Is it safe?

Electroconvulsive therapy (ECT) is a **medical treatment** that involves a **short electrical stimulation of the brain** while the patient is under anesthesia (American Psychiatric Association, 2019). A study found that **after 3 of 6 ECT treatments, all patients had a positive response**. The use of **ECT is safe**, results conclude that ECT can benefit mothers experiencing postpartum psychosis (Forray & Ostroff, 2007).

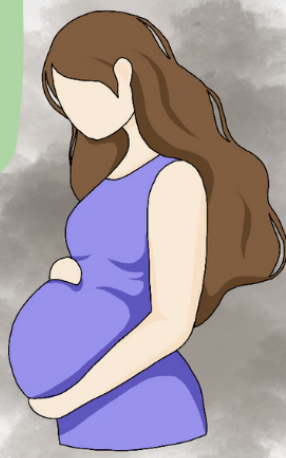
Critical Period of ECT Treatment

It is beneficial to receive ECT **within the first 6 months after the delivery** of a newborn. One study revealed that a higher percentage of patients (87%) who completed ECT during the postpartum period experienced **higher response rates** than patients who completed ECT outside of that period (73.5%). The researchers discovered that 96% of patients **experiencing extreme symptoms** of postpartum psychosis responded drastically and benefitted from ECT (Rundgren et al., 2018).



Is Pharmaceutical Therapy Not Working?

Other methods, such as **psychotropic medications**, have many side effects. These include both **short and long-term effects** on breastfed infants. Unlike psychotropics, ECT does not cause any side effects while breastfeeding. A study found that **10 out of 15 participants** who **continued breastfeeding** while receiving ECT **showed no adverse side effects** (Babu & Chandra, 2013). Pharmaceutical therapy is not universally effective, meaning ECT should be a viable option because it has promising results for most patients with postpartum psychosis.



References

American Psychiatric Association. (2019, July). What is electroconvulsive therapy (ECT)? Psychiatry.org - What is Electroconvulsive Therapy (ECT)? Retrieved June 8, 2022, from https://www.psychiatry.org/patients-families/ect

Babu, G. N., Thippeswamy, H., & Chandra, P. S. (2013). Use of electroconvulsive therapy (ECT) in postpartum psychosis—a naturalistic prospective study. Archives of Women's Mental Health, 16(3), 247–251. https://doi.org/10.1007/s00737-013-0342-2

Forray, A., & Ostroff, R. B. (2007). The use of electroconvulsive therapy in postpartum affective disorders. The Journal of ECT, 23(3), 188–193. https://doi.org/10.1097/yct.0b013e318074e4b1

Rundgren, S., Brus, O., Båve, U., Landén, M., Lundberg, J., Nordanskog, P., & Nordenskjöld, A. (2018). Improvement of postpartum depression and psychosis after electroconvulsive therapy: A population-based study with a matched comparison group. Journal of Affective Disorders, 235, 258–264. https://doi.org/10.1016/j.jad.2018.04.043

by Alyssa Georgescu

PRÉCIS

art by alyssa georgescu

Environmental Pollution & Reading

by Harshdeep Dhaliwal

Environment pollution refers to the introduction of stimuli that may divert one's attention and disorganize their focus, resulting in stress. Reading speed impairment is correlated with stimuli like noise, light, and volume. An increase in these distractors results in slower reading speeds, with negligible effects on reading comprehension. However, some studies report impairments in consonant recognition. This leads to the question: how do we counteract these distractors? Since responsive behaviour depends on an individual and their environment, reducing distracting stimuli, such as noise and volume, will enhance reading speed. This finding is especially useful in academic settings because studying in silent or white noise environments can result in faster reading and allow individuals to allocate the saved time for other tasks.

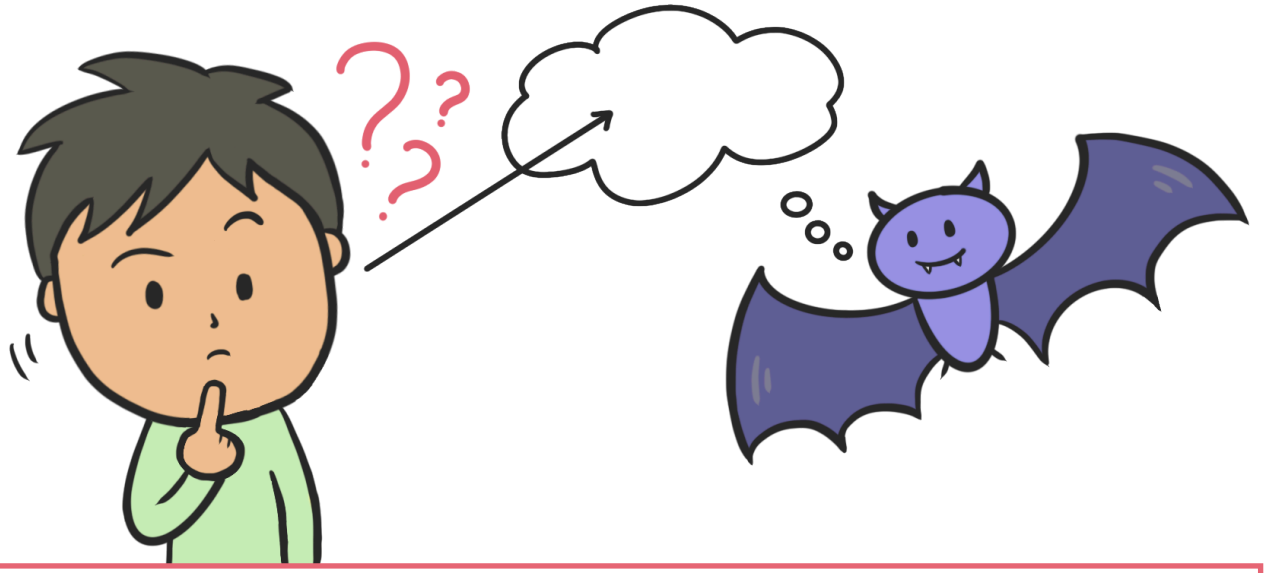
References

Batho, L. P., Martinussen, R., & Wiener, J. (2020). The Effects of Different Types of Environmental Noise on Academic Performance and Perceived Task Difficulty in Adolescents With ADHD. *Journal of attention disorders*, *24*(8), 1181–1191. https://doi.org/10.1177/1087054715594421

Lin C. C. (2014). Effect of noise intensity and illumination intensity on visual performance. *Perceptual and motor skills*, *119*(2), 441–454. https://doi.org/10.2466/26.24.PMS.119c20z1

Moradi, S., Lidestam, B., & Rönnberg, J. (2013). Gated audiovisual speech identification in silence vs. noise: effects on time and accuracy. *Frontiers in psychology*, *4*, 359. https://doi.org/10.3389/fpsyg.2013.00359

Özer, S., Zengin, M., & Yılmaz, H. (2014). Determination of the Noise Pollution on University (Education) Campuses: a Case study of Ataturk University. *Ekoloji*, *23*, 49-54. https://doi.org/10.5053/ekoloji.2014.906



art by kaitlyn mah

Understanding Consciousness

by Freddy Bishay

An organism cannot truly understand, although it can attempt to, another organism's conscious experiences—their thoughts and feelings. An organism can try to understand another organism's experiences by using objectivity and breaking down their experiences into simple physical components. However, dividing an organism's life into objective components eliminates the organism's point of view and excludes its conscious experiences, as thoughts and feelings are subjective. While it is possible to gain a superficial understanding of another organism's experience, one organism cannot adequately understand the thoughts and feelings of another.

References

Nagel, T. (1974). What is it like to be a bat? *The Philosophical Review*, *83*(4), 435–450. https://doi.org/10.2307/2183914

art by kaitlyn mah

Study Time Predictions

by Emma Resendes

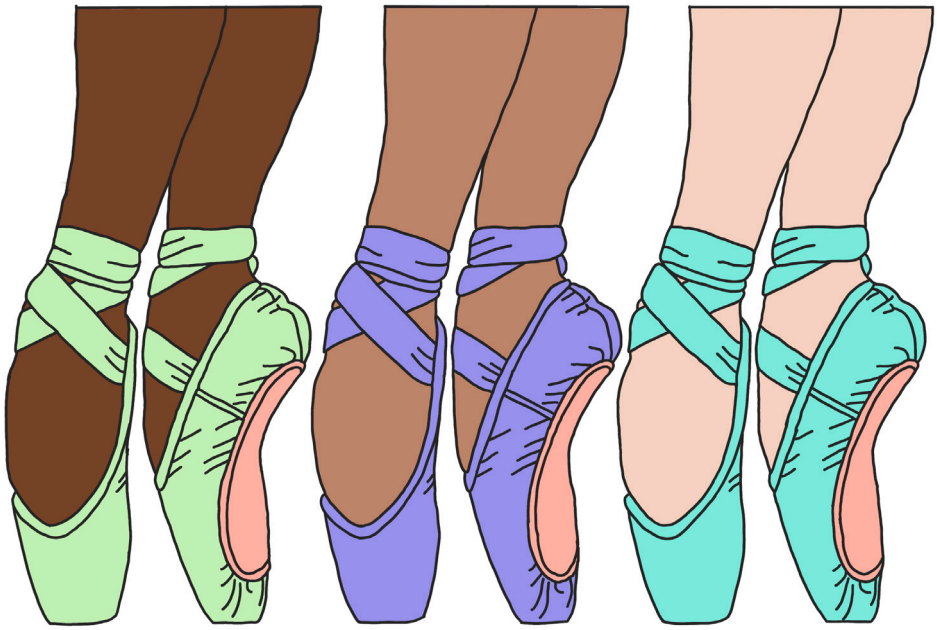
Student's accuracy in planning how much time they will study depends on the type of deadline for the task. When the deadline for the assessment is flexible, students are more likely to overestimate the amount of time they will study. Study time estimates are more accurate when there is a fixed deadline for the assessment because students have no choice but to meet the deadline. Students should consider setting a fixed personal deadline for assignments with a flexible deadline to ensure they are more accurate in planning the amount of time they need to study.

References

Pychyl, T. A., Morin, R. W., & Salmon, B. R. (2000). Procrastination and the planning fallacy: An examination of the study habits of university students. *Journal of Social Behavior and Personality*, *15*(5), 135-150. http://dx.doi.org/10.1093/acprof:oso/9780195376685.003.0011

The Physical Language of Dance

by Freddy Bishay

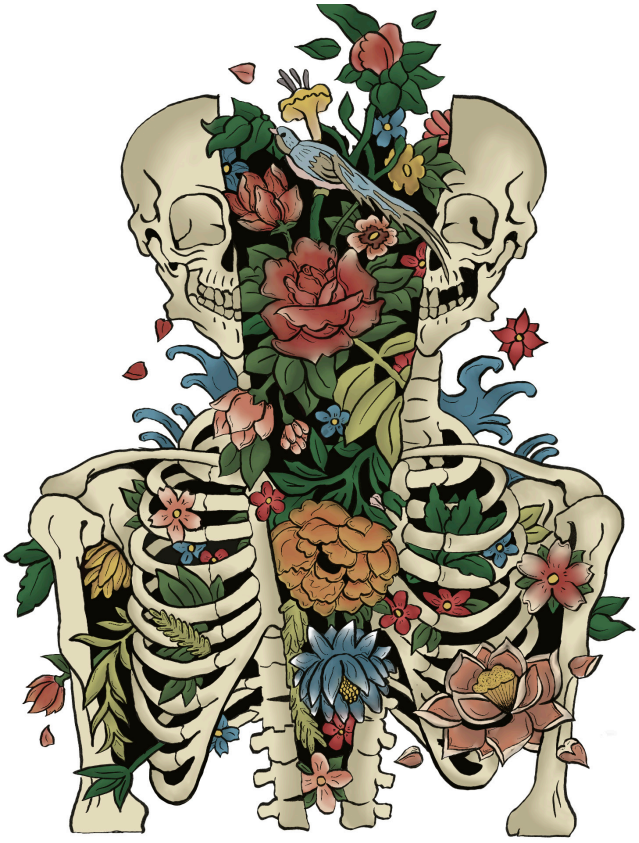


art by alyssa georgescu

Dance is a unique human behaviour involving performers and observers. Performing dance is a physical act, yet it activates Broca's area—a brain region typically associated with speech production. This activation of Broca's area suggests that dance can serve as a form of communication. Furthermore, although observing a dancer's movements is a visual experience, it activates brain regions associated with movement. This indicates that an observer interprets a dancer's movements the same way a listener interprets a speaker's words. Dance's exceptional ability to activate brain regions related to communication and comprehension suggests that it is a powerful tool for human connection.

References

Brown, S., & Parsons, L. (2008). The Neuroscience of Dance. *Scientific American*, *299*(1), 78–83. https://doi.org/10.1038/scientificamerican0708-78



art by alyssa georgescu

The Problem with Using Reductionism to Describe Consciousness

by Madeline Sinnamon

Describing conscious experiences using reductionism is improper. When describing conscious experiences, people practice reductionism to help break the experience down into simple facts. However, difficulties arise when using simple facts to express the unique perspectives associated with a person's conscious experiences. For instance, describing conscious experiences using simple facts would be the same as using simple facts to describe the experience of falling in love—impossible. For people who seek a deeper understanding of consciousness, attempting to describe the experience with reductionism is a disservice. Trying ways other than reductionism to portray consciousness may help people better understand the experience.

References

Nagel, T. (1974). What is it like to be a bat? *The Philosophical Review*, *83*(4), 435–450. https://doi.org/10.2307/2183914

ABSTRACTS

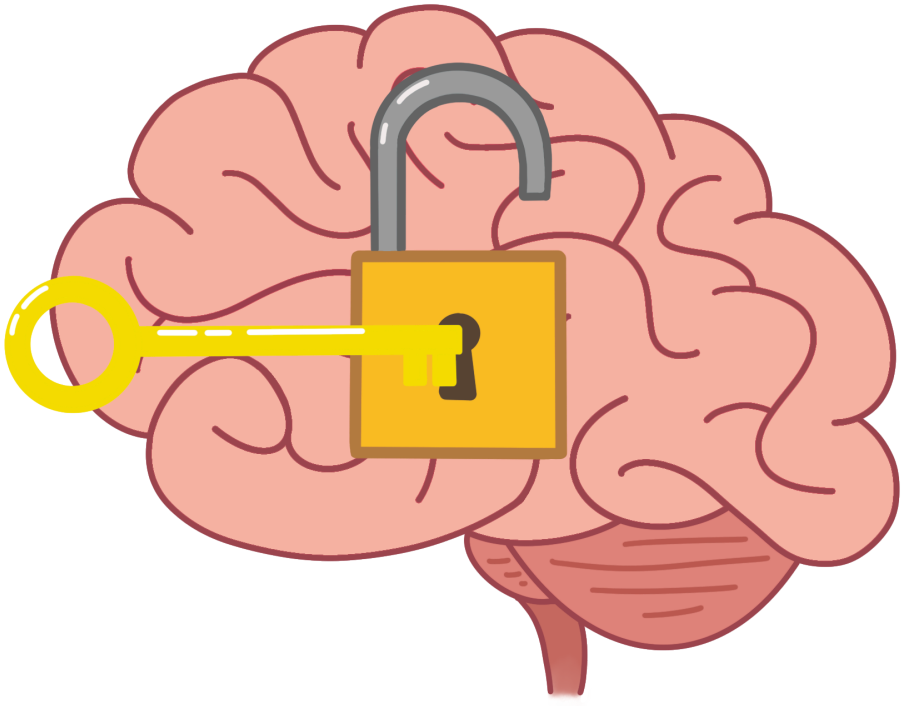
Overcoming Functional Fixedness

Comparing the Effectiveness of Meaning Training and Unconventional Demonstrative Learning

by Emily O'Halloran, Jessica Ralph, Julie Park, Asal Ozlati, Mackenzie Peddle & Dr. Hongjin Sun

Background

Functional fixedness (FF) is a bias which prevents individuals from using an object for a purpose other than its conventional one, and in so doing, inhibits creative problem-solving capacity. This bias can be measured through the attempted completion of functional fixedness problems, which are tasks for which the solution requires the unconventional use of an object. Humans develop FF during childhood, likely through social learning. Clegg & Legare (2015) found that children who watched objects being used conventionally demonstrated a greater degree of FF compared to those who saw the objects not being used at all. This study, along with experiments by Ebel et al. and German & Defeyter, implicate the role of observational social learning, coined by the present authors as conventional demonstrative learning (CDL), in the development of FF.



art by kaitlyn mah

The inverse of CDL, unconventional demonstrative learning (UDL), involves exposure to objects being used unconventionally. Despite knowledge of CDL's role in the development of FF, UDL has yet to be studied as a method for reducing FF.

Purpose

This study examined the effectiveness of UDL in reducing FF. It compared the impact of UDL on FF to that of meaning training (MT), an established procedure for overcoming FF. The study sought to introduce and authenticate UDL as an additional approach to reducing FF, and thereby enhancing problem solving abilities.

Methods

The study involved three stages. In the baseline phase, participants attempted two FF problems. During the training phase, half the participants underwent MT and the other half underwent UDL. In the testing phase, participants were given three additional FF problems to complete. Each participant's completion rate (CR: number of FF problems successfully completed) and completion time (CT: time taken to complete each problem) were measured both before and after training.

Results

Both groups showed mean improvements in CR and CT after the training phase. The MT group performed better than the UDL group following training, demonstrated by a greater mean CR and lower mean CT. However, the two groups showed similar degrees of improvement between their respective baseline and testing scores, indicated by a considerable increase in CR and decrease in CT following training.

Conclusion

These results indicate that while MT is likely more effective at reducing FF than UDL, UDL may nonetheless be another valuable method for attenuating functional fixedness.

References

Clegg, J. M., & Legare, C. H. (2015). Instrumental and Conventional Interpretations of Behavior Are Associated With Distinct Outcomes in Early Childhood. *Child Development*, *87*(2), 527–542. https://doi.org/10.1111/cdev.12472

Ebel, S. J., Hanus, D., & Call, J. (2019). How prior experience and task presentation modulate innovation in 6-year-old-children. *Journal of Experimental Child Psychology*, *180*, 87–103. https://doi.org/10.1016/j.jecp.2018.12.004

German, T. P., & Defeyter, M. A. (2000). Immunity to functional fixedness in young children. *Psychonomic Bulletin & Review*, *7*(4), 707–712. https://doi.org/10.3758/bf03213010

art by alyssa georgescu

The Influence of Fear of Regret on Hoarding Symptom Severity

by Kiran Roy, Dr. Irena Milosevic, Dr. Randi E. McCabe, & Dr. Karen Rowa

Hoarding Disorder (HD) is a mental disorder characterized by difficulty discarding objects, excessive acquiring of objects, and clutter of objects which may impede day-to-day life (Frost & Hartl, 1996; Shaw et al., 2015). Previous research discovered that many individuals with HD also struggle with experiential avoidance (EA), or the unwillingness to remain in contact with negative emotional states (McHugh & Otto, 2012; Norberg et al., 2019). However, fear of a specific emotion, like regret, has not been explored despite theoretical links between fear of regret (FoR) and hoarding. The present study aims to address whether FoR (as well as the general ten-

dency to experience regret) predicts HD severity above and beyond experiential avoidance. During intake at the Anxiety Treatment and Research Clinic at St. Joseph's Hospital, participants (N=261) completed the Saving Inventory-Revised (SI-R, Frost et al., 2004) to assess HD severity, the Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2014), the Regret Scale from the Regret and Maximization Scale (Schwartz et al., 2022), and the Fear of Regret in Discarding measure (Author & Author, 2020) to assess HD symptom severity, EA, the tendency to experience regret and FoR respectively. The sample ranged in age (M=34.4, SD=12.6) and ~95.4% had a previous diagnosis (e.g. anxiety, obsessive compulsive, etc.). The diagnosis of HD would not be assessed until after participant intake and thus HD diagnosis was not assessed by this study, only severity of HD symptoms. Prediction of HD severity was assessed through hierarchical linear regression. Results indicate that EA accounted for 7.4%, $F(1,249) = 20.94$, $p < .001$ of the variance in HD severity, while an additional 30.9% of the variance is accounted for by FoR, $F(2,248) = 56.78$, $p = <0.001$. Regret accounted for an additional 11.4% of the variance of HD severity above EA, $F(2,247) = 17.01$, $p < 0.001$. These results indicate that there is a difference in predictive quality between FoR and regret to HD severity. Therefore, FoR and regret may be two distinct constructs, with FoR being a more powerful predictor of HD severity than EA or the general tendency to experience regret.

References

Frost, R. O., & Hartl, T. L. (1996). A cognitive-behavioral model of compulsive hoarding. *Behaviour Research and Therapy*, *34*(4), 341–350. https://doi.org/10.1016/0005-7967(95)00071-2

Frost, R. O., Steketee, G., & Grisham, J. (2004). Measurement of compulsive hoarding: saving inventory-revised. *Behaviour Research and Therapy*, *42*(10), 1163–1182. https://doi.org/10.1016/j.brat.2003.07.006

THANK YOU FOR READING OUR JOURNAL!

psynapse

psynapse

ISSUE 006