

The University of Toronto Scarborough Psychology and Neuroscience Departmental Students' Association (PNDA) 2022 Academic Research Panel



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Abstract

The Psychology and Neuroscience Departmental Students' Association (PNDA) advocates on behalf of its members to the Department of Psychology at University of Toronto Scarborough and fosters academic excellence and career growth. PNDA provides academic and professional support by creating opportunities to interact and network with like-minded individuals while serving as a hub for all matters pertaining to the Psychology, Mental Health studies, and Neuroscience programs, thereby connecting members, students, faculty, staff, organizations, institutions, companies, and communities. The Academic Research Panel (ARP) is an annual event focused on fostering research and student engagement amongst UTSC students specifically in the psychology, neuroscience, and mental health studies programs. Each year the ARP is led by undergraduate students from PNDA providing students with a platform to network and showcase their scientific work. This booklet is composed of abstracts from the presenting undergraduate students.

Keywords: neuroscience; psychology; mental health; substance use; social psychology; social identities; COVID-19; cultural differences

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Neuroscience Conference Abstracts

AAV9-mediated KCC2 upregulation improves neurological recovery following traumatic spinal cord injury

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Traumatic cervical spinal cord injury (SCI) is a life-threatening and life-changing event that results in sensorimotor impairment and autonomous dysfunction despite the presence of spared neural tissue at the lesion site. The presence of spare neural tissue could be a potential therapeutic target for most SCI patients, however, their inability to maintain functional neurotransmission exhibits a major challenge in endogenous recovery and effectiveness of rehabilitation-based treatment. While emerging preclinical data suggest that the neuron-specific K⁺/Cl⁻ cotransporter 2 (KCC2) downregulation plays a major role in the inactivation of spared neural tissue after SCI, the impact of its upregulation remains unexplored. The aims of the study were: (1) examining the ability of KCC2 gene therapy to alter SCI-induced synaptic neuroplasticity, its impact on the (2) functional improvement, and (3) the neuroanatomical alterations. Female adult Wistar rats received a clip compression-contusion SCI at the C6/C7 level of the spinal cord. Injured rats were randomized, in a blinded manner, to receive AAV9-mediated KCC2 or GFP expression. Animal mass and neurobehavioral assessments including open field BBB, inclined plane, and grip strength

were performed on day 3 and weekly until week 12 post-SCI. At 12 weeks post-SCI, additional neurobehavioral analyses including FLAS score, Von Frey, and CatWalk gait analysis were performed. The KCC2 treatment resulted in significantly longer stride length for forelimb and hindlimb, increased inclined plane angle, stronger grip strength, and improved FLAS and open field BBB score as compared to GFP and Sham group. No significant differences were observed when comparing outcomes between the swing speed of the forelimb and hindlimb. Enhancements in overall gait pattern, hindlimb-forelimb coordination, trunk stability, and gross muscle strength signifies that the therapeutic treatment of KCC2 upregulation has the potential to improve the quality of life of individuals suffering from SCI.

Mental Health and Substance Use Conference Abstracts

One more glass: A cognitive insights proposal into heavy alcohol consumption

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In 2021, 18% of Canadians reported heavy alcohol consumption compared to 11% in 2017. Prolonged misuse or overuse of alcohol is a precursor to Alcohol Use Disorder (AUD), a progressive illness adversely impacting an individual's psychosocial and physical well-being and quality of life. Therefore, the alarming increase in alcohol consumption rates raises concern for the prospective increase AUD prevalence. Despite previous research highlighting the significance of pharmacological treatment and therapeutic care to treat AUD amongst patients, there is a lack of understanding regarding how AUD can be prevented. This appraisal aimed to use evidence from previous studies to develop a proposal to tackle this growing challenge. Habitual motivation is correlated with loss of behavioural control, psychophysical withdrawal, and automaticity. To address automaticity, widely available awareness campaigns on alcohol's negative consequences (i.e., comorbidities, psychosocial effects) should be implemented. Existing associations between alcohol and positive thoughts can be targeted by introducing new associations focused on the negative aspects of alcohol consumption. Individuals will form newer connections that reduce the automaticity associated with drinking. Furthermore, youth who were regularly exposed to billboard advertisements of alcohol reported positive attitudes towards alcohol and greater acceptance of alcohol consumption. Therefore, demonstrating a clear connection between attitudes of drinking and targeted marketing can impact drinking behaviours amongst new and habitual drinkers. To address the role of marketing on alcohol attitude formation and consolidation, regulations must be imposed to ensure appropriate alcohol marketing. Marketing of alcohol products should be restricted from school areas (i.e., no billboards, or flyers). Lastly, self-perception inaccuracies of alcohol consumption, risky behaviours (i.e., drinking and driving), and adverse consequences are greater amongst people with a family history of alcohol abuse. The lack of awareness regarding adverse long-term consequences of alcohol consumption is correlated with heavy drinkers reporting their consumption as unharmed. Therefore, strategies should prioritize health literacy amongst alcohol users and the public to address self-perception inaccuracies. In conclusion, the rapid growth of alcohol consumption raises concern for alcohol-use disorder, calling for immediate prevention and intervention strategies to address this growing concern.

Coping with discrimination: A focus on Asian Americans and their mental health

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Racism against Asian Americans is common and can adversely affect their mental health. Despite that Anti-Asian discrimination also exists and had increased since the pandemic, limited research has been focused on how Asian Americans cope with racism. It is thus important to understand how they cope with discrimination, and which coping strategies can effectively protect mental health. This study investigated which coping strategies are the most frequently used by Asian Americans compared to another racialized group (i.e., Black Americans), and how these strategies predict mental health in both groups. A longitudinal study assessed Asian Americans (N=138) and Black Americans (N=120)' use of coping strategies when facing discrimination, including engagement strategies (e.g., communication, benefit-finding) and disengagement strategies (e.g., minimizing, situational avoidance). The analysis examined Asian and Black Americans' frequencies of using these strategies and how they predict mental health (e.g., life satisfaction) one month later. The results showed that Asian Americans showed unique profiles of coping with discrimination and distinct associations between coping and mental health outcomes, compared to Black Americans. Regarding mental health outcomes, benefit finding appears to be particularly helpful for Asian Americans, whereas communication appears to be particularly beneficial for Black Americans. This research advances our understanding of how Asian Americans may uniquely cope with racial discrimination and protect their mental health. The

findings are especially important to understand now, given the rising rates of anti-Asian discrimination during COVID, but are relevant beyond this time point as well, as Asians face discrimination more generally in their lives.

A review of mental health strategies within minorities to inform a community-centered method for increasing help seeking for Muslim Canadians

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Muslim Canadians (MC) experience internal and external barriers to mental health services. Previous research has shown that Muslims face discrimination from healthcare providers when accessing mental health services. However, research has not yet explored how help seeking can be increased for this specific community. We can take lessons from other minority groups that share similarities with MC to derive suggestions to increase help seeking among MC (i.e., Jewish people and South Asian people in western contexts). A literature review was completed for 8-weeks to evaluate papers on Jewish, South Asian, and Muslim mental health in western contexts. First, I found that acknowledging intersectionality and prioritizing community-based interventions are major themes that may increase help seeking among MC. Second, training therapists to be understanding of faith-based decisions and training religious counsellors (i.e., imams) counselling strategies are effective methods that Jewish communities used to support their population, which could also be successfully applied among MC. Additionally, therapists need to ensure they understand their clients' religious needs to make recommendations for treatment that aligns with Islamic values. I also found that although imams work closely with the Muslim community and provide counselling on a regular basis, they lack training on how to support mental health crises. External organizations can support imams by providing training to help them become more capable and comfortable with counselling Muslims on mental health. Together, these informed approaches can support future initiatives to increase help seeking among MC.

A cross-cultural examination of GAD symptoms in an undergraduate student sample

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Cross-cultural studies have shown considerable cultural variations in the expression of somatic versus psychological symptoms of emotional distress. Most notably, critical research on depression has found that individuals of Chinese heritage emphasize experiencing more somatic symptoms than psychological ones in comparison to their Western counterparts. However, little is known about whether similar cultural differences can be generalized to anxiety disorders. Amongst the few studies that have examined this phenomenon, the findings are inconsistent. Additionally, although it has been proposed that the stigma associated with the expression of distress leads individuals to emphasize more somatic symptoms rather than psychological ones, an empirical examination of this hypothesis in anxiety disorders remains untested. In the current study, we examined the presentation of experiences of worry and anxiety amongst a non-clinical undergraduate sample composed of East-Asian (n = 124) and Euro-Canadian (n = 27) students. Participants completed the Generalized Anxiety Disorder-7 Scale (GAD-7) and Self-rating Anxiety Scale (SAS), and the somatic and psychological subscales were compared. Additionally, participants completed a mental illness Go/No-Go Association Task (GNAT) and the Attitudes towards Mental Health Problems (ATMHP) to measure their implicit and explicit attitudes towards mental illness respectively. Mediation analyses will be conducted to examine whether these factors serve as mediators between participants' cultures and the presentation of experiences of worry and anxiety. Preliminary results show that as expected, East-Asians showed a greater tendency to emphasize somatic symptoms of anxiety than psychological ones. Contrary to expectations, this trend was also observed amongst Euro-Canadians, and to greater extents than East-Asians. We expect that due to higher levels of reported stigma amongst East Asians, both implicit and explicit attitudes towards mental illness will account for somatization tendencies in this group. These results have important implications for diagnostic considerations in primary care settings, particularly when somatic symptoms of anxiety obscure psychological ones.

Acculturation, acculturative stress, and risk taking: An experimental approach

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The existence of the human population depends on our ability to adapt and evolve with changing social situations. An instance that requires immense adaptation is immigration, where individuals need to adapt to the predominant culture while maintaining beliefs about their heritage culture. Acculturation is the process of balancing beliefs and adapting, given the contact with dissimilar cultural values, and is accompanied by unique stressors termed acculturative stress. Acculturative stress can stem from discrimination, linguistic difficulties, financial stress etc. Such stressors may also contribute to increased risk-taking behavior in individuals undergoing acculturation. Therefore, the current study aims to evaluate the relationship between acculturation, acculturative stress, and risk-taking using an experimental paradigm. It was hypothesized that both acculturation and acculturative stress will have a significant effect on risk-taking. 219 participants of East Asian and South Asian descent were recruited and asked to complete a computerized risk-taking task called the Balloon Analogue Risk Task (BART). Inspired by the cultural frame switching model, individuals were randomly assigned to one of three conditions: mainstream, heritage, or control where they were exposed to unique priming cues. Participants completed the BART twice, once before and once after the priming trials. In addition, they were asked to complete various questionnaires to measure acculturation, acculturative stress, and subjective risk-taking. Results indicate a significant influence of acculturative stress on risk-taking behavior where individuals under greater acculturative stress took lower risks in the task compared to those who experience lower acculturative stress. Hence, experiencing acculturative stress may make individuals more conservative in risky situations. Therefore, interventions aimed at integrating immigrants from East Asian and South Asian cultures should consider the impact of acculturative stress on behavior. Future studies may also evaluate the influence of social support and religion on risk-taking, in addition to acculturative stress.

Living with multiple cultural identities and its effects on self-esteem

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The current research examines the role of balancing various cultural memberships during adolescence on identity development. We examine cultural coexistence abilities, and internal cultural reconciliation as predictors of self-esteem levels in students living with multiple cultural identities. 160 individuals completed the modified Multicultural Identity Integration (MII) scale, the Multicultural Identity Integration Scale (MULTIIS), and the Rosenberg Self-Esteem Scale (RSES). The analysis revealed that higher MII scores, which indicate lower cultural compatibility, was associated with lower self-esteem. Increased MULTIIS integration scores, signifying higher identity integration, was associated with improved self-esteem. However, self-esteem was not predicted by gender or age. These findings support the existence of a relationship between one's capacity to hold multiple cultural identities and their self-esteem, but do not support previous findings linking gender to self-esteem.

Investigating the influence of reward-related processes on the relationship between childhood adversity and COVID-related stress and anxiety

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COVID-related stress is higher in vulnerable populations including those who have experienced childhood trauma. Recent work demonstrates that greater anticipation of rewards is associated with reduced levels of COVID-related stress. Given that childhood adversity predicts dysregulation of reward-related processes, this study examined whether the anticipation and consumption of rewards indirectly influence the relationship between childhood adversity and COVID-related stress and anxiety. It is important to explore whether reward-related processes differentially influence how emerging adults cope with stressors. A diverse sample ($N = 195$) of emerging adults ($M = 23$ years) were recruited from the community. Participants completed self-report questionnaires assessing childhood adversity (Childhood Trauma Questionnaire – CTQ), reward anticipation and consumption (Temporal Experiences Pleasure Scale – TEPS), COVID-related stress and anxiety (COVID Stress and Anxiety Scale – CSS/CAS), and current life stress (Perceived Stress Scale – PSS). Mediation analyses were conducted to determine whether there is a unique mediating role of reward anticipation and consumption. Reward anticipation but not consumption, partially mediated the relationship between CTQ and PSS ($b = .0442$, 95% CI [.0107, .0830]). While CTQ predicted CSS and CAS ($b = .4313$, 95% CI [.0968, .7659]; $b = .0538$, 95% CI [.0133, .0943]), reward anticipation and consumption did not mediate this relationship. Reward anticipation selectively mediated the relationship between childhood

trauma and current life stress. Identifying deficits in reward anticipation can inform coping strategies that target goal-directed action. However, this mediation was not demonstrated with COVID-related stress and anxiety. The CSS/CAS assessed COVID-related stress and anxiety over 7 days, while the PSS assessed current life stress over 30 days. It is possible that reward-related processes are associated with dispositional measures of stress, which may be better reflected over a longer period, as assessed by the PSS. Thus, these findings highlight the importance of examining COVID-related stress longitudinally.

Social Psychology Conference Abstracts

Mitigating the impact of misinformation: Examining the effectiveness of emotion-based interventions against false news sharing

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The COVID-19 pandemic has elicited the spread of false information, leading to inaccurate beliefs about how to combat the virus. Thus, social media users must discern false from true news when deciding whether to share it; however, sharing may be affected by factors other than attention to accuracy. These may include emotionality. Indeed, false news tends to represent negative sentiment to a greater extent than true news does and moral-emotional words in false news have been found to affect its spread online. This warrants an intervention against false news sharing which brings awareness to the use of emotionality in news on social media. This study tested two such interventions that we adapted from those which bring awareness to accuracy. First, Amazon Mechanical Turk workers rated their likelihood of sharing news headlines formatted as Facebook posts. Then, they were randomly assigned to one of three conditions: control (i.e., no intervention), emotion intervention (i.e., a rating of the extent of emotionality in one headline), and emotion and training intervention (i.e., the emotion intervention followed by a message explaining the link between emotionality and false news). All participants completed headline-sharing ratings again, followed by auxiliary questionnaires. We predicted that each intervention will reduce the likelihood of sharing false, but not true, news from pre- to post-test. The emotion and training intervention reduced likelihood of sharing false, but not true, news from pre- to post-test, while the emotion intervention alone did not. This study established that a simple educational intervention about emotion can improve discernment between true and false news when making sharing decisions. Future work can then optimize their design and conduct field testing.

Interpersonal correlates of political extremism

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Existing literature has demonstrated that political extremists, who hold views that deviate from the majority, possess similar psychological patterns of thinking. Much of this research examines cognitive facets of political extremists such as cognitive rigidity or complexity and fundamental attribution error. However, there is a lack of research on how interpersonal factors correlate with political extremism, particularly with loneliness, a subjective feeling of social disconnect and isolation. Given that extremist groups hold views outside of the mainstream and that such groups can provide a sense of community, loneliness may be a predictor of extremist belief endorsement. Moreover, personality may be a mediator of this relationship since certain personality traits (e.g., disagreeableness, neuroticism) could predispose individuals to feel more socially isolated. Thus, the aim of this study is to examine how loneliness correlates with extremist beliefs and how this relationship may be mediated by personality. It is hypothesized that increased feelings of loneliness will be correlated with greater endorsement of extremist beliefs, especially for individuals who are low in agreeableness, extraversion, conscientiousness, openness, and high in neuroticism. To answer our research question, self-report measures will be employed as the primary form of data collection and be administered to participants through the Prolific platform. Specifically, political views and extremist beliefs will be assessed with the Social and Economic Conservatism Scale and the Two-Factor Political Ideology Scale. Subscales from the HEXACO 100-item Personality Scale and the Big Five Aspects Scale will be used to measure personality traits. Lastly, loneliness will be captured through the UCLA Loneliness Scale. Examining the links between loneliness, extremism, and individual differences could expand our understanding of risk factors and ultimately inform prevention strategies against radicalization.

The impact of immigration induced childhood trauma on academic achievement

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Trauma amongst immigrant children can be attributed to post-settlement stressors and discrimination leading to negative mental health effects. This study investigates the effects of childhood trauma on the development of psychiatric disorders in immigrant children and how this impacts their academic achievements. Strain trauma is experienced by immigrants as they are forced to restart their life in another unfamiliar country due to expulsion from their homelands and their safe lifestyles. This results in a lack of the feeling of self-cohesion as immigrants often reside in unempathetic environments under circumstances of emotional neglect. Early traumatic stress has an impact on the social, physiological, and psychological development in children and can interfere with their learning and achievements in academia. Childhood trauma affects functioning and development as it alters the wiring of the brain and impacts organ systems. This results in stress coping mechanisms that are governed by lower thresholds for stress responses that last throughout their lifetimes. This increases their chances of developing stress-related diseases, depression, anxiety, and cognitive impairment in adulthood. This causes intrusive thoughts, excessive arousal, difficulties in paying attention, and agitation, and disorganization in attachment. Childhood trauma can affect children's ability to adjust their physiological arousal resulting in the inability to self-regulate which is related to self-destructive behaviors, substance abuse and behavioral problems. Therefore, immigrant children are more likely to drop out of school. The age during childhood and adolescence at the time of immigration also increases the likelihood and severity of development of these psychiatric disorders and the likelihood of dropping out. Interventions at an institutional level can prevent dropout and assist transition amongst immigrant youth. Evidence of a school-based program has been shown to aid immigrant youth in receiving trauma-based care in a non-intimidating environment. This can break the cycle of low education rates and socioeconomic status of immigrants.

Creation of diagnostic tool to identify spatial abilities in scholastically classified slow learners

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Spatial abilities are thought to be pronounced in some scholastically classified slow learners. In scholastically classified slow learners with high spatial abilities, concepts can be taught in ways that exploit their spatial ability. The purpose of this study is to identify spatial abilities among scholastically classified slow learners to promote learning of basic academical concepts through ways that make understanding easy for spatial learners. The goal is to prove that a significant part of the population is spatially abled be it spatial memory or spatial reasoning with the help of a self-designed diagnostic tool. To achieve this goal a tool in the form of a multilevel multidimensional (i.e., providing the facility of displaying more than one pattern, the maze has been developed). This tool has an indicated start and an indicated stop point. The subject is asked to take an attempt to solve the maze. At every fork of the maze, there is a flag on each diverged path either red in color or green in color with a random division of percentage in order to review the actual understanding of the subject. This is a time-based test, and a standard time of 5 minutes is for an average spatial learner. A total of 400 subjects were tested on 5 different patterns and as a result, 21% of this sample was spatially abled and 17% was scholastically classified as slow learners. We conclude that this group of the children attending school is not slow at learning, but these children require to be taught using their strengths which will help them be at par with their academically skilled fellows.

Conflicts of Interest

The author(s) declare that they have no conflict of interests.

Authors' Contributions

IC: Served as the Chair of the Planning committee for the conference, drafted the abstract booklet, assisted authors with their abstract submissions and gave final approval of the version to be published.

MK: Served as a member of the planning committee for the conference, assisted authors with their abstract submissions, and gave final approval of the version to be published.

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