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Letter from the Managing Editorial Staff

Dear Readers,

It is our great honour to present the ninth volume of the *Simon Fraser University Undergraduate Journal of Psychology*. This publication serves as a platform for undergraduate students to share their original research, meta-analyses, and critical essays with the broader academic community. It also offers an invaluable opportunity for students to gain insight into the academic review and publication process, helping to shape their skills as scholars and researchers.

This journal is a learning opportunity for all involved, not only for the authors but also for the dedicated editors, reviewers, and managers who contribute to its development. Each stage of the process—from submission to review to final publication—provides a unique experience that fosters growth and collaboration within our academic community.

We would like to extend our deepest gratitude to our undergraduate and graduate reviewers for their thoughtful feedback, hard work, and flexibility throughout the review process. Your contributions are essential to maintaining the high standards of our journal. We also sincerely thank the authors who submitted their work. This year, we received an impressive total of 39 submissions, and we are pleased to publish 12 outstanding pieces in this volume.

To our readers, we appreciate your support and engagement with this journal. We hope that you find inspiration and insight in the research presented here. We are incredibly proud of the authors whose work is showcased in this edition, as well as the dedicated team who made this publication possible.

Thank you for being a part of this journey.

Sincerely,
Aislynn Sharrock & Erika Binder
The Managing Editorial Staff

Original Articles

Review Articles

Impact of Optogenetic Activation of the Thalamic Reticular Nucleus on Sleep Architecture in Mice

Arai, Mayuko., Tok, Sean., & Kent, Brianne.

Abstract— **Alzheimer's disease (AD) is a progressive neurodegenerative disorder affecting millions worldwide and is often accompanied by significant sleep disturbances, such as sleep fragmentation, early awakenings, decreased sleep efficiency, and insomnia. It has been suggested that the alterations in activity of the thalamic reticular nucleus (TRN) are closely associated with sleep disruptions in AD. Evidence suggests that activating neurons expressing gamma-aminobutyric acid (GABA) within the TRN may enhance sleep quality and potentially ameliorate neuropathology associated with AD. However, the precise mechanisms through which TRN influences sleep disruptions and AD pathophysiology remain poorly understood. In this study, we investigated whether activating GABAergic TRN neurons could alter sleep architecture in wild-type mice. Utilizing optogenetic stimulation, we observed that activation of these neurons did not significantly alter sleep state durations or delta wave power, a key indicator of Slow Wave Sleep (SWS). Furthermore, the application of a two-virus strategy inadvertently led to non-specific opsin expression beyond the targeted TRN area. We discuss the potential factors that contributed to these outcomes, providing directions for future investigations to better delineate the role of the TRN in sleep and AD.**

Keywords— *Thalamic Reticular Nucleus, Sleep, Alzheimer's Disease, Optogenetics*

I. Sleep Disruption Associated with Alzheimer's Disease

Alzheimer's disease (AD), a progressive neurodegenerative disorder that impacts over 58 million individuals worldwide, accounts for 60-80% of dementia cases (Alzheimer's Association, 2024). AD is characterized by an accumulation of amyloid-beta (Aβ) containing plaques and tau-containing neurofibrillary tangles (for a review, see Breijyeh & Karaman, 2020). Sleep disturbances, prevalent in most AD patients, manifest as sleep fragmentation, early awakenings, reductions in non-rapid eye movement (NREM) and rapid eye movement (REM) sleep, and increased daytime napping (Kent et al., 2021). Recent studies underscore the potential of sleep disturbances to exacerbate AD progression by altering the dynamics of Aβ production and clearance, along with the accumulation of abnormally phosphorylated tau protein (Barthélemy et al., 2020; Lucey et al., 2018; Winer et al., 2019). These findings are also supported by studies in mouse models of AD, which link sleep disruption to increased Aβ and phosphorylated tau levels, often considered the pathogenic drivers of AD (Kent et al., 2021).

Despite this accumulating evidence, the precise mechanisms through which sleep disruptions contribute to AD pathophysiology remain elusive. Understanding these pathways are crucial for developing targeted interventions that could mitigate the progression of AD through the treatment of sleep disturbances.

II. The Role of the Thalamic Reticular Nucleus in Sleep Regulation and Alzheimer's Disease

It has been suggested that the thalamic reticular nucleus (TRN) may play a critical role in sleep disturbances and AD. The TRN is a subcortical structure, composed of a sheet of GABAergic neurons that release gamma-aminobutyric acid (GABA) (Crabtree et al., 2018). The TRN is known to modulate sleep architecture and associated neural oscillations through robust inhibition of the thalamus during sleep periods (Lewis et al., 2015; Visocky et al., 2023). During wakefulness, the TRN engages with sensory thalamic nuclei to facilitate selective attention (Halassa & Acsády, 2016). Recent studies suggest the TRN is also actively involved in the initiation of sleep spindles (Lewis et al., 2021; Latchoumane et al., 2017; Visocky et al., 2023). Sleep spindles are a burst of rapid, rhythmic brain activity that occurs during NREM sleep, particularly N2, and is associated with memory consolidation (Leong et al., 2022). Importantly, the TRN is believed to play a crucial role in both sleep maintenance and the regulation of slow wave sleep (SWS), which is the N3 stage of NREM sleep in humans (Jagirdar et al., 2021). SWS is critical for declarative memory consolidation (Diekelmann & Born, 2010) and Aβ clearance (Xie et al., 2013), and thus, these functions of the TRN underscore its potential impact on conditions such as AD.

The TRN exhibits anatomical and functional differences between its rostral and caudal sides. The rostral subdivision primarily receives fibers from limbic thalamic nuclei, which are not involved in sensory information propagation (Visocky et al., 2023). The dorsorostral TRN, is implicated in arousal-related activities; the activity of neurons here intensifies during arousal in wakefulness and decreases in correlation with sleep-associated oscillations, such as spindles and slow waves (Crabtree, 2018). Optogenetic inhibition of the rostral TRN has been associated with elongated sleep episodes, suggesting its significant role in arousal mechanisms (Visocky et al., 2023). In contrast, the caudal TRN interacts with thalamic nuclei responsible for integrating sensory information (Visocky et al., 2023), and the dorsocaudal TRN is suggested to be involved in sleep-related activity, such as slow waves and sleep spindles (Crabtree, 2018). Inhibiting dorsocaudal TRN region using optogenetics induced fragmented sleep (Visocky et al., 2023).

There has been growing interest in the association between TRN and AD. It is suggested that the neurons in the TRN may be present and functional, but less active in a mouse model of AD, expressing human amyloid precursor protein (APP) (Jagidar et al., 2021; Hazra et al., 2016). One study utilized excitatory Designer Receptors Exclusively Activated by Designer Drugs (DREADDs) to restore the activity of TRN neurons in APP mice (Jagidar et al., 2021). This activation not only improved sleep architecture but also decreased Aβ plaque burden, a key neuropathological feature of AD (Jagidar et al., 2021). This emerging evidence highlights the potential role of TRN as a therapeutic target for ameliorating key aspects of AD pathology.

III. MODULATING TRN ACTIVITY WITH HIGH SPATIAL AND TEMPORAL PRECISION USING OPTOGENETICS

In the present study, we employed optogenetics to examine the role of TRN in sleep and sleep disruptions associated with AD. Optogenetics is a technique that controls the activity of specific types of neurons using light (Boyden, 2011). This technique combines optical and genetic methods to achieve bidirectional control of neural signaling by expressing light-sensitive proteins, known as opsins, in mammalian cells (Sidor et al., 2015). Optogenetics is recognized for its ability to precisely manipulate neuronal activity with exceptional spatial and temporal accuracy, both ex vivo and in vivo (Swanson et al., 2022).

Boyden and colleagues (2005) found that optogenetic stimulation of mammalian neurons could control neural activity by leveraging Channelrhodopsin-2 (ChR2) (Boyden et al., 2005). ChR2, a light-gated cation channel, was originally discovered in the unicellular green alga *Chlamydomonas reinhardtii* (Boyden et al., 2005). It was found that upon photon absorption, opsins like ChR2 and halorhodopsin (NpHR) undergo a conformational change, facilitating ion transport across the plasma membrane, which results in either the depolarization or hyperpolarization of neurons (Swanson et al., 2022).

Optogenetics does have limitations due to its invasiveness, which may restrict its application in certain animal experiments and therapeutic contexts. Notably, the technique requires precise gene and light delivery to the target area and the expression of optogenetic proteins may impact cell health (Allen et al., 2015). Additionally, the heat and light from stimulation could potentially alter the physiology of local and distant circuits (Allen et al., 2015). The use of blue light in sleep studies might influence animal behaviour and neurological activities since mice, commonly used in optogenetic studies, have photoreceptors sensitive to blue light (Araragi et al., 2021).

Despite these challenges associated with optogenetics, measures like optimizing protein expression and calibrating light intensity can help overcome these issues. The strengths of optogenetics include the ability to modulate cell types specifically and precisely on a millisecond timescale (Boyden et al., 2015; Berg et al., 2020; Sidor et al., 2015). In addition, optogenetics offers substantial flexibility for experimental applications at the cellular, organ, or whole-animal level (Ferenczi et al., 2019). Various firing patterns of neurons can be produced by employing different stimulation paradigms (Mahmoudi et al., 2017). The activity of neurons can also be manipulated bidirectionally by using more than one type of opsins. For instance, it is possible to co-express ChR2, an excitatory opsin activated by blue light, with halorhodopsin, which is an inhibitory opsin activated by yellow light (Swanson et al., 2022). Furthermore, implanted devices for stimulation can be used repeatedly without the need for additional treatment (Berg et al., 2020). The precise control and flexibility of optogenetics enable innovative approaches, offering significant benefits in advancing the field of neuroscience.

IV. CURRENT STUDY

Despite significant advancements in optogenetic techniques, there has been limited research using optogenetics to explore the potential connection between the TRN and sleep disruptions in AD. In the present study, we aimed to optogenetically activate the GABAergic neurons in the TRN to enhance SWS in the cortical areas of wild-type mice. We targeted both rostral and caudal coordinates of the TRN with optogenetic stimulation and evaluated the effects on sleep architecture.

A. Methods

Animals: All experimental protocols were approved by the Simon Fraser University Animal Care and Use Committee (Protocol #1353P-22). We used a total of 15 male C57BL/6J mice, aged 2 to 4 months, from Charles River Laboratories (Senneville, Quebec), due to their genetic uniformity, reduced variability, robust health, and widespread availability. The mice were single-housed under a 12:12h light/dark cycle with ad libitum access to food and water. Out of the 15 animals, five were used to target the caudal TRN and five were used to target the rostral TRN, each group being injected with viruses to express the light-sensitive ion channel in the target area. The last five animals served as controls, receiving injections of sterile water and the same optogenetic stimulation.

Stereotactic Adeno-Associated Virus (AAV) Infusions: We administered intracranial injections that included a mixture of two viruses. The first virus (rAAV-VGAT1-CRE-WPRE-hGH polyA) was used to express the Cre recombinase protein under a GABAergic promoter (VGAT1) in the TRN. The second virus (pAAV-EF1a-Chr2(H134R)-DIO-YFP) was used to express the light-sensitive ion channel, ChR2, in Cre-positive cells (i.e., GABAergic cells in the TRN). The mixture was prepared to inject a total of 250 nl per animal, maintaining a 3:7 ratio of Cre to ChR2 virus. Throughout the surgery, isoflurane was administered to maintain deep anesthesia. Intracortical viral injections were administered to the right posterior cortex. We tested the following coordinates to target the rostral and caudal TRN: Rostral AP: -0.8, ML: -1.2, DV: 3.5 and Caudal AP: -1.4, ML: -2.0, DV: 3.4, relative to bregma. A 1-ul Hamilton syringe was used to inject either the virus mixture or sterile water as the control. Following the injection, the virus was allowed to diffuse for 5 minutes at each coordinate, and then for an additional five minutes after the needle was moved up by 0.2 mm. For analgesia, Meloxicam (5 mg/kg, IP) and lidocaine (7 mg/kg, SC at the incision site) were administered at the start of the procedure. To prevent dehydration, Lactated Ringer's

solution (10 mg/kg) was given at the end of surgery. All animals were given at least five weeks of incubation time to allow for viral expression before initiating optogenetic stimulation.

EEG and Optical Fiber Implantation: Following the virus incubation periods, the mice were implanted with 2-channel electroencephalogram (EEG)/ 1-channel electromyography (EMG) head caps (Pinnacle Technology, catalog number 8201-SS) and fiber optic cannulas. During the implantation surgery, the animals were maintained under deep anesthesia using isoflurane. First, a fiber optic cannula (250μm diameter, NA 0.66) from Prizmatix (Holon, Israel) was inserted into the right TRN, targeting the rostral or caudal TRN (Rostral AP: -0.8, ML: -1.2, DV: 3.5; Caudal AP: -1.4, ML: -2.0, DV: 3.4, relative to bregma), using a custom-designed stereotaxic arm. A metallic cannula cover was attached to each optic fiber to prevent light leakage. The fiber was then secured with a small amount of vet bond (3M, London, ON) and light-curing adhesive (Pentron, Orange, CA). Once the adhesive was cured, EEG/EMG headmounts were implanted. The EEG implant involved placing four stainless steel screws at coordinates AP: +/- 3 mm, ML: +/- 1.5 mm relative to bregma. These screws were inserted through a prefabricated EEG headmount. Additionally, two EMG electrode wires were placed under the nuchal muscles. Dental cement mixed with black acrylic paint (to prevent light leakage) was applied to firmly secure both the optic fiber and the EEG headmount. For analgesia, Meloxicam (5mg/kg, IP), buprenorphine (0.07mg/kg, SC), and lidocaine (7mg/kg, SC at the incision site) were administered at the start of the procedure. To prevent dehydration, Lactated Ringer's solution (10mg/kg) was administered at the end of surgery. A recovery period of at least seven days was allowed before the commencement of EEG recordings.

EEG Recordings and Optogenetics Simulation: After a recovery period of one week, EEG/EMG signals were recorded for three hours from Zeitgeber Time (ZT) 14 as a baseline. Following this baseline assessment, the mice were optogenetically stimulated with a 473 nm LED (blue light). Three different stimulation patterns, were employed based on previous studies (Lewis et al., 2015; Ni et al., 2016; Viscoky et al., 2023). All stimulations started at ZT14 and continued for three hours. For chronic stimulation, a 30-second stimulation period was alternated with a 30-second no-stimulation period over the 3 hours. The other two stimulation patterns were tonic, in which either 3 Hz or 8 Hz 10 ms pulses were repeated for one second, followed by a 6-second off period. The light output for each animal was adjusted to achieve a power of 4.5 mW, based on the power measurements taken for each optic fiber before surgery. To minimize light leakage from the optogenetic cannula, the entire optogenetics cable was covered with a heat shrink tube. The EEG cables were lengthened to allow simultaneous EEG recording and optogenetic stimulation. Video cameras enabled 24-hour monitoring of the animals and enhanced the accuracy of sleep scoring based on the EEG/EMG data.

Sleep Analysis: EEG recordings were analyzed using Sirenia Sleep Pro software (Pinnacle Technology). EEG recordings were evaluated for wake, NREM, and REM sleep stages using 10-second epochs. Initially, the data were clustered by grouping epochs according to EEG and EMG frequency bands (e.g., delta, theta, alpha, beta, gamma), categorizing periods of NREM, REM, and Wake. The classification of each epoch was subsequently verified by visual review of EEG and associated video recordings, along with spectral plots. Wake periods were characterized by low-amplitude EEG (predominant frequency above 4 Hz) and high-amplitude EMG, while NREM sleep was characterised by high-amplitude EEG with frequencies under 4 Hz and low-amplitude EMG. REM sleep was identified by predominant EEG frequencies ranging between 4 and 8 Hz, consistent low-amplitude EEG waveforms, low-amplitude EMG, and a transition from NREM. Epochs were classified based on the predominant state (>50%) within each 10-second epoch. Power spectrum analysis utilized the Fast Fourier Transform. Frequency bands were defined as follows: delta (1–4 Hz), theta (4–8 Hz), alpha (8–12 Hz), beta (12–30 Hz), and gamma (30–50 Hz), with a bandpass filter applied from 1-100 Hz to all data to remove low-frequency artifacts below 1 Hz.

Histology: To assess viral expression, animals were perfused with phosphate-buffered saline (PBS), and brains were extracted and fixed in 4% paraformaldehyde (PFA). After 24 hours, the brains were placed in a 30% sucrose solution for 48 hours, then embedded in optimal cutting temperature (OCT) gel (Sakura Finetek USA, Torrance, CA). Coronal and sagittal slices, 40 microns thick, were collected and stored in PBS. Sections were blocked with Normal Goat Serum (Vector Laboratories, Brockville, ON), followed by incubation with Anti-VGAT Polyclonal Antibody (1:1000; catalog # PA5-27569; Thermo Fisher Scientific, Waltham, MA). Subsequently, the slices were incubated with Goat Anti-Rabbit IgG (H+L) Cross-Adsorbed Secondary Antibody, Alexa Fluor™ 647 (1:1000; catalog # A-21244; Thermo Fisher Scientific, Waltham, MA). Images were captured on a confocal microscope to display DAPI staining in blue, EYFP in green, and VGAT in red/purple.

Statistical Analysis: Statistical analyses were performed using R (version 4.3.3). Power data were analyzed both raw and normalized as a percentage of the accumulated power from 1–100 Hz for each EEG electrode (frontal and parietal) to reduce inter-animal variability. Mixed-design ANOVA was used to assess differences in the time spent in each state across different stimulation paradigms. To compare data across different time points at 10-minute intervals, we employed a Linear Mixed Model (LMM) using the nlme package, incorporating an added quadratic effect to capture potential non-linear trends. The fixed effect in the model was the time from stimulation onset (ranging from 10 to 170), and animal ID was included as a random intercept. The largest model for the dependent variable followed the formula: DV ~ time + time^2. LMMs are particularly effective at accounting for both fixed effects, such as the influence of time, and random effects, such as individual differences among animals. This approach enabled us to accurately assess the impact of time on the dependent variable—deviation from baseline—while effectively managing variability introduced by individual animal differences.

V. RESULTS

A. Sleep-Wake Durations During 3-Hour Stimulation

The three hours of EEG recordings taken during the optogenetic stimulation were analyzed to determine the time spent in each sleep or wake state (Figure 1). For NREM sleep duration, the mixed-design ANOVA indicated a significant main effect of stimulation type (comparing 30-second chronic stimulation, 3 Hz tonic stimulation, and 8 Hz tonic stimulation) ($F(3, 30) = 4.00$, $p = 0.016$). There were no significant effects for injection conditions (comparing rostral, caudal, and control) ($F(2, 10) = 1.78$, $p = 0.218$) or their interaction ($F(6, 30) = 0.54$, $p = 0.774$), suggesting no significant difference across injection sites. Post hoc analysis using Tukey HSD showed no significant pairwise differences among stimulation types ($p > 0.05$). Similarly, for wake duration, a significant main effect of stimulation type was observed ($F(3, 30) = 3.02$, $p = 0.045$), but no significant effects for injection conditions ($F(2, 10) = 1.67$, $p = 0.237$) or their interaction ($F(6, 30) = 0.65$, $p = 0.690$). Post hoc analysis also did not show any significant pairwise differences among stimulation types ($p > 0.05$). For REM sleep, no significant effects were found for stimulation type ($F(3, 30) = 2.727$, $p = 0.062$), injection coordinate ($F(2, 10) = 0.226$, $p = 0.802$), or their interaction ($F(6, 30) = 1.502$, $p = 0.211$). These findings suggest that different stimulation paradigms and injection conditions did not significantly affect the durations of sleep or wake states within the study's constraints.

B. Effects of 3 Hz Stimulation on NREM Duration and Delta Power at 10-Minute Intervals

To assess changes throughout the three hours of 3Hz optogenetic stimulation, the time spent in NREM sleep was analyzed every 10 minutes. When the caudal TRN was stimulated (Figure 2A), the analysis of the scaled Linear Mixed Model revealed a significant quadratic effect for the scaled time variable (*fixed effect coefficient* = -1.08, $p = 0.0150$, $df = 83$). This negative coefficient indicates that the relationship between time and the deviation in NREM sleep duration from the baseline follows a downward curving pattern. This suggests that as time progresses from the onset, the deviation in NREM sleep duration initially increases but then decreases, forming a parabolic trend.

However, the stimulation did not lead to the same effects when targeting the rostral TRN or in the control group. For the rostral TRN condition, the quadratic term had a coefficient of -0.48 ($p = 0.2642$, $df = 83$). For the control group, which did not receive the viral vector injection, the quadratic term had a coefficient of 0.12 ($p = 0.7976$, $df = 83$). These results indicate that the time-related changes in NREM duration did not exhibit a significant quadratic pattern in these conditions.

Additionally, the normalized delta power spectra were analyzed without distinguishing between sleep or wake states. The deviation from the baseline in normalized delta power, expressed as a percentage of the baseline power, was examined during the 3 Hz optogenetic stimulation. When the caudal TRN was stimulated, the scaled Linear Mixed Model for the deviation in normalized delta power from baseline in the parietal EEG electrode revealed a significant quadratic effect of the scaled time variable (*coefficient* = -7.28, $p = 0.0078$, $df = 83$) (Figure 2B). This suggests a non-linear relationship, where the deviation in delta power initially increases and then decreases over time. However, for the frontal EEG electrode, the quadratic term for the scaled time variable was not significant (*coefficient* = -4.39, $p = 0.0991$, $df = 83$), indicating no strong evidence of a non-linear relationship between time and the deviation in normalized delta power from baseline in this region.

The analysis of normalized delta power for the rostral TRN stimulation group and the control group revealed no significant effects. For the rostral TRN condition in the parietal electrode, the quadratic term had a coefficient of 0.55 ($p = 0.8499$, $df = 83$). In the frontal electrode, the quadratic term had a coefficient of -1.49 ($p = 0.5397$, $df = 83$). Similarly, in the control group, the quadratic term for the parietal electrode had a coefficient of 2.06 ($p = 0.5941$, $df = 83$), and for the frontal electrode, the coefficient was -2.47 ($p = 0.4331$, $df = 83$). These results indicate that there were no significant quadratic effects of time on normalized delta power in these conditions.

Taken together, these findings suggest that during 3 Hz optogenetic stimulation targeting the caudal TRN, NREM duration exhibits a peak over time, as indicated by a significant quadratic effect. Consistently, normalized delta power—a key characteristic of NREM sleep—peaks in the parietal electrode during stimulation, while no such effects are observed in the frontal electrode. This regional specificity highlights more pronounced responses in the parietal region, which is proximal to the stimulation site, compared to the frontal region. The lack of significant effects when the rostral TRN was stimulated suggests potential differences in the effectiveness of optogenetic stimulation on modulating NREM sleep depending on the target region. Additionally, the absence of effects in the control group, which was injected with water instead of a viral vector, indicates that the presence of the viral vector might be crucial for the observed effects.

C. Expression of CHR2 Viral Vector

Figure 3 presents representative images showing the right TRN of two C57BL/6 mice injected with the ChR2 viral vector. All animals were analyzed, but not shown here. The confocal images revealed that the virus appears to have spread to the caudate putamen. Although VGAT staining (represented in purple) was expected to show a distinct pattern within the TRN, it was observed uniformly throughout the area without specific enrichment in the TRN across all analyzed mice, and this uniform VGAT distribution potentially contributed to the off-target expression of ChR2. Additionally, enlarged ventricles were observed in some of the sections from the different animals.

VI. DISCUSSION

Despite the potential role of the TRN in sleep disturbances associated with AD, only a few studies have investigated this possible linkage. To explore the TRN as a potential intervention target to alleviate sleep disruptions, we employed optogenetics to specifically modulate the GABAergic neurons in the TRN of C57BL/6 mice. Our results show a trend toward increased NREM duration and

delta power in the parietal region during 3Hz optogenetic stimulation with an initial increase followed by a decrease, forming a parabolic pattern. However, the high variability among subjects and the off-target expression of the ChR2 viral vector warrant further investigation.

First, high variability among animals was likely due to off-target ChR2 viral expression, as illustrated in Figure 3. We used two viruses: one to deliver Cre recombinase to the target GABAergic cells, using a VGAT (vesicular GABA transporter) promoter to target these cells, and the second to deliver the opsin ChR2, which is expressed only in the presence of Cre recombinase. While the VGAT is predominantly expressed in neurons that synthesize and release GABA, the intended specific targeting of the TRN did not occur as expected. Previous studies using transgenic mice (VGAT-ChR2) observed preferential expression of ChR2 in the TRN compared to surrounding subcortical areas (Halassa et al., 2011; Lewis et al., 2015). However, in our study, VGAT expression within the TRN was not distinct and appeared to spread to the subcortical area after injecting the virus with the VGAT promoter (Figure 3). This spread of VGAT expression may have contributed to the off-target expression of ChR2 in our study. The cause of the unlocalized VGAT expression that diverges from previous findings, could be due to the specific VGAT promoter used, which varies in expression specificity. We employed VGAT1, while VGAT2 was used in the VGAT-ChR2 transgenic mice in the study by Halassa et al. (2011) (Lewis et al., 2015 did not specify). The variation in promoters could explain the off-target ChR2 expression observed, necessitating further investigation.

In addition to further investigation into the virus or transgenic mice using VGAT, future studies should also consider employing parvalbumin (PV)-Cre mice to target the GABAergic neurons in the TRN. Neurons that express PV, a Ca2+-binding protein, are believed to account for 80% of all neurons in the TRN (Vantomme et al., 2019; Visocky et al., 2023), and a subpopulation of GABAergic neurons in the TRN is suggested to express PV (Thankachan et al., 2019). Previous studies have used PV-Cre mice to selectively activate the TRN-PV neurons through viral injection to achieve Cre-dependent expression of ChR2 (Thankachan et al., 2019), or to selectively inhibit the TRN-PV neurons by achieving Cre-dependent expression of archaerhodopsin (Arch) or halorhodopsin (NpHR) (Thankachan et al., 2019; Visocky et al., 2023).

Another potential factor that may have influenced our findings relates to the limitations associated with promoting sleep in animals that do not exhibit disrupted sleep patterns. For instance, a previous study demonstrated an increase in NREM sleep duration by stimulating TRN GABAergic neurons in VGAT-Cre mice, which do not show sleep disruptions. However, the increase in NREM duration observed was modest, averaging only 3.5% (Lewis et al., 2015). Conversely, a chemogenetic study that activated TRN GABAergic neurons using the excitatory DREADD (designer receptor exclusively activated by designer drugs) hM3Dq in APP mice—a mouse model of AD with sleep fragmentation—showed an improvement in sleep architecture. Specifically, they observed an increase in

NREM/SWS duration and total sleep duration in APP mice (Jagirdar et al., 2021). Yet, in non-transgenic (NTG) mice expressing hM3Dq in the TRN, the same clozapine N-oxide (CNO) treatment did not alter SWS duration or wake time (Jagirdar et al., 2021). These findings suggest the presence of ceiling effects, or homeostatic mechanisms which are not impaired in regular, non-diseased mice. Ceiling effects may prevent significant increases in NREM/SWS, even when TRN GABAergic neurons are activated. This implies that restoring activity in the TRN could potentially improve sleep architecture in models exhibiting disrupted sleep, but not necessarily in healthy animals.

Furthermore, the power of the optogenetic LED may have also impacted our results. The enlarged ventricles observed in the histology images (Figure 3) could be attributed to the light power used in this study, as well as the reaction to the virus or inter-mouse variability. If the light power was too intense, it is possible that the surrounding area of the cannula was damaged, leading to the enlarged ventricles. However, it is also suggested that the stimulation power must reach a certain level to induce detectable changes, particularly since our 3-channel EEG/EMG system measures EEG signals only broadly in the frontal and parietal regions, making it difficult to detect changes in small local areas. Lewis et al. (2015) demonstrated that tonic optogenetic stimulation of GABAergic TRN neurons induced cortical slow waves and modulated sleep architecture. They found that when the laser power was low (<2mW), the delta (1-4 Hz) power increased only at recording sites near the ipsilateral somatosensory cortex. Conversely, when the laser power was high (>2mW), delta power increased across a broader cortical area, including the frontal and contralateral cortices. They concluded that activation of a small population of TRN neurons with weak laser power induces slow waves in a local ipsilateral cortical region, while stronger activation of a larger population induces global cortical slow waves. Their findings suggest that significant changes in EEG delta power in our study may depend on the laser power used for stimulation. It is also important to note that although Lewis et al. observed increased delta power across multiple cortical areas with high laser power (2-3.8mW), the power required to achieve similar results in the present study may have varied due to differences in ChR2 expression levels.

Lastly, it is also possible that some findings from previous studies might not necessarily indicate the beneficial effects of TRN activation on sleep due to potential issues with experimental design. For instance, Ni et al. (2016) reported that phasic spindle-like optogenetic stimulation—administered at 8Hz for 1 second at 6-second intervals for 1 hour—significantly reduced wake duration and accelerated sleep onset. They also reported that this stimulation also significantly increased the durations of total and NREM sleep during the stimulation period, compared to unstimulated controls. However, this difference could be attributed to a potential experimental design issue in Ni et al.'s study, where the control group was not optogenetically stimulated. Ideally, the comparison should have been made with control mice that did not express optogenetic receptors but received the same light stimulation to eliminate potential confounding effects caused by the optogenetic light.

The present study underscores the need for further investigation to assess the impacts of TRN activation on sleep. Optimizing ChR2 expression using transgenic Cre-mice and refining the stimulation parameters should enable us to determine whether site-specific activation of TRN neurons indeed modulates sleep. Additionally, employing AD mouse models, which exhibit disrupted sleep, may be necessary to induce detectable changes in sleep architecture through stimulation. Further exploration of this topic will enhance our understanding of the role of the TRN in sleep and AD pathology and its potential as a therapeutic target in the future.

APPENDIX

**Figure 1.** *Time spent in each state during the optogenetic stimulation*
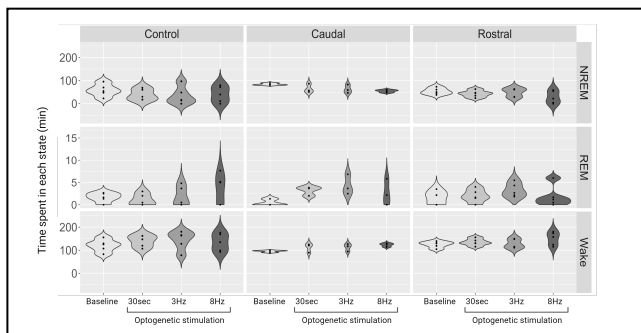
Note. The time spent in each sleep or wake state (minutes) over the three-hour optogenetic stimulation period. Graphs are presented separately for the control group and the ChR2-injected groups targeting the caudal or rostral TRN. Black dots represent data from an individual mouse.

Figure 2. *Changes in the time spent in NREM sleep and normalized delta power during 3Hz stimulation targeting the caudal TRN*
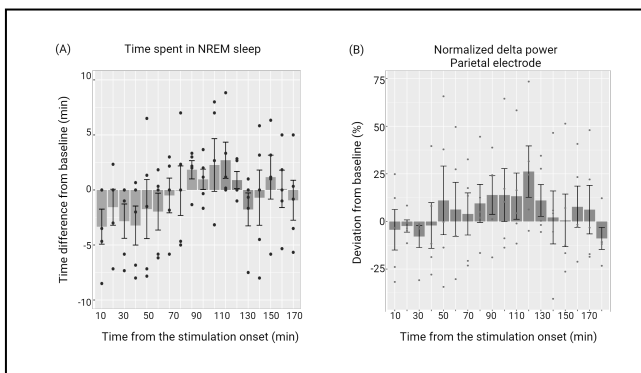
Note. (A) Differences from baseline in NREM sleep time, plotted in 10-minute intervals during the same stimulation period. (B) Normalized delta power deviations from baseline in the parietal electrode, expressed as a percentage and plotted every 10 minutes. The power was averaged for each animal over 10-minute intervals, without distinguishing between wake and sleep states. Mean ± SEM. Black dots represent data from an individual mouse.

Figure 3. *ChR2 expression in TRN*
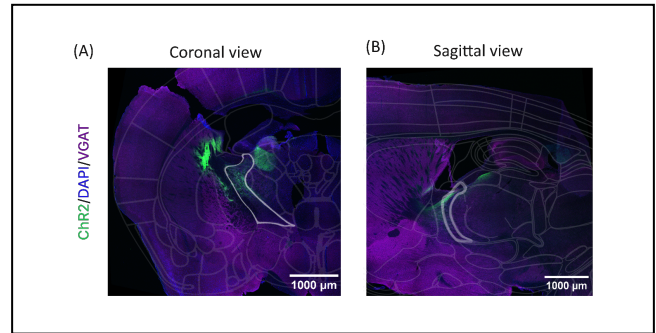
Note. Example of histology at 10x from C57BL/6 mice with ChR2 viral injections. The blue channel is DAPI and the green channel is EYFP, indicating off-target ChR2 expression outside of the TRN (outlined with white). Although VGAT staining in purple was expected to show a distinct pattern within the TRN, it was observed universally without specific enrichment in the TRN. (A) coronal view and (B) sagittal view.

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Memories of Parenting Behaviour and Their Relation to Young Adults' Friendships: Moderating Effects of Cognitive and Dispositional Factors

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Abstract - Research has consistently demonstrated the effect of positive parenting on young adults' social outcomes. However, a vast number of factors can moderate this link. The present study examined whether trait mindfulness and adaptive cognitive modification may be moderators in the link between young adults' recollections of parenting and the present-day quality of friendships. An undergraduate sample (N = 626) was surveyed regarding memories of their parents' positive parenting during their first 16 years of life, their own levels of trait mindfulness, and the quality of current interpersonal relationships with friends. Participants also provided narratives on their past vs. present perceptions of a negative parenting event from their childhood, and these narratives were coded for adaptive cognitive modifications in attributions for parenting behaviours. Analyses indicated that mindfulness enhanced the association between recalled positive parenting and friendship quality. Adaptive cognitive modification did not show statistically significant effects on the relationship between recalled positive parenting and friendship quality. These results show that dispositional factors such as mindfulness, but not adaptive cognitive modification for attributions, influence the way that recollections of parents' parenting are related to young adults' positive friendships.

Keywords— *Parenting, Friendship, Mindfulness, Attributions, Recollections*

I. MEMORIES OF PARENTING BEHAVIOUR AND THEIR RELATION TO YOUNG ADULTS' FRIENDSHIPS: MODERATING EFFECTS OF COGNITIVE AND DISPOSITIONAL FACTORS

As is well known, the interactions that parents have with their children throughout development can have a significant impact on later social outcomes (e.g., Carson & Parke, 1996; Green & Baker, 2011; Kahen et al., 1994). Belsky et al. (1991) have presented a potential framework through which parenting is related to social interactions, where supportive, engaged, and sensitive parenting behaviours form the basis for social interactions that have more positive qualities such as mutual-reciprocity and trust. On the other hand, parenting characterized by harsh and rejecting behaviours forms the basis for more negative social interaction qualities, such as hostility and distrust, when interacting beyond the parent-child dyad. To support this claim, research has shown that parental engagement and parental responsivity assessed in childhood relates to children's greater positive affect in social contexts and increased peer engagement (Kahen et al., 1994). Conversely, parenting behaviours that involve negative emotional reciprocity (the use of negative emotional tones in response to negative emotion from the child) during development is associated with children's more maladaptive social relationships with others during childhood, as characterized by social-avoidant behaviours and physical aggression (Carson & Parke, 1996).

Similar findings have also been seen to extend beyond childhood, where negative displays of affect from parents in childhood impacts social interactions in early adulthood by encouraging the use of negative emotional expressions (Kim et al., 2001). Additionally, parents who display more positive affect towards their children raise children who are more socially competent (Green & Baker, 2011), whereas displays of negative affect from parents are related to poorer social outcomes, comparatively (Eisenberg et al., 1998). Positive parenting has also been associated with romantic relationship quality, where recalled emotional support behaviours during childhood were associated with disclosure and help-seeking behaviours in young adults' romantic relationships (Black & Schutte, 2006).

Young adults' memories of parenting behaviours have also been implicated in distinct social outcomes, specifically in the context of friendships (Alegre & Benson, 2019; Black et al., 2007; Wise & King, 2008). For example, college-aged women who reported higher levels of family cohesion and recreation during childhood also reported overall higher quality of present-day friendships with best friends, as compared to those who reported lower levels of childhood family cohesion and recreation (Wise & King, 2008). Recalled parental warmth during childhood has also been implicated in the present-day elevated positive friendship quality of young adults, as measured by degree of interaction, feeling understood by friends, and positive quality time spent together (Alegre & Benson, 2019). Additionally, recalled maternal emotional support behaviours during childhood relate to young adults' greater self-disclosure in conversations with friends, and recalled neglectful parenting from the mother during childhood relates to heightened emotionality in social interactions with friends (Black et al., 2007).

As the above evidence illustrates, parenting behaviours and the parent-child relationship are instrumental in fostering positive friendship qualities. Moreover, the memories of these parenting behaviours seem to relate to young adults' friendships. Based on this evidence, the following research study is formed upon the basis that the early bond between a child and their caregiver allows for a specific social-cognitive orientation that relates to the child's perceptions of, and

behaviours in, friendships that can persist into adulthood. The present research intended to replicate past literature that has demonstrated the link between recollections of positive parenting and young adults' friendship quality (Alegre & Benson, 2019; Black et al., 2007; Wise & King, 2008), and expand on such research by examining how cognitive and dispositional factors may moderate the link between recalled positive parenting and young adults' friendship quality.

A. Mindfulness as a Moderator

Based upon the principles of Buddhist tradition, mindfulness is a relatively new and budding area of psychological research. Mindfulness refers to the practice or tendency to focus attention to the present moment, and to do so without judgement (Kabat-Zinn, 2003). In traditional Buddhism, this definitional framework corresponds to meditation techniques created for the purpose of grounding one's conscious experiences to the present moment in order to fulfill the spiritual conditions of enlightenment as described by the Buddha (Gethin, 2015). More modern definitions of mindfulness refer to present-moment awareness of personal experience in order to achieve a state of psychological and physical well-being (Siegal et al., 2009). From one academic perspective, mindfulness is considered a trait quality that exists on some level across individuals (e.g., Baer et al., 2006). This dispositional quality can be nurtured through training and meditation, as demonstrated by mindfulness training courses focused on the reduction of psychopathologies (e.g., Kiken et al., 2015).

Dispositional mindfulness has been implicated in a variety of social behaviours and perceptions (e.g., Barnes et al., 2007; Donald et al., 2019). Cognitively, those with high levels of dispositional mindfulness perceive their interpersonal relationships differently than those with lower levels of trait mindfulness. For example, it has been consistently demonstrated that individuals who exhibit a mindful disposition have higher levels of relationship satisfaction in the context of romantic relationships (Barnes et al., 2007; Quinn-Nilas, 2020). These highly mindful individuals also report better quality of relationships with coworkers (Mesmer-Magnus et al., 2017). Behaviourally, trait mindfulness has been demonstrated to be associated with prosocial behaviours and attitudes (see Donald et al., 2019 for review), interpersonal forgiveness (Karremans et al., 2020), and positive self-expression in social contexts (Dekeyser et al., 2008). Moreover, research illustrates that mindfulness influences the development and maintenance of emotion regulation skills (Roemer et al., 2015), which may be instrumental in the development of adaptive social interaction tendencies.

Mindfulness has also been investigated specifically in the context of friendship quality (e.g., Dai et al., 2022). Being mindful during social interactions has been linked to more positive friendship quality (Pratscher et al., 2018). In addition, social competence as measured by number of friendships and popularity in friendships has been associated with the levels of dispositional mindfulness in adolescents (Miner, 2007). In a meta-analysis conducted by Dai and colleagues (2022), it was found that mindfulness-based intervention strategies for children and adolescents are related to positive peer interactions, general improvements in relationship quality with peers, and a decrease in negative peer interactions. Based on this evidence, it is highly likely that mindfulness plays a role in the development of adaptive social tendencies, and for this reason, it was hypothesized that higher dispositional mindfulness levels would have an enhancing effect on the association between recollections of positive parenting and friendship quality.

B. Adaptive Cognitive Modification as a Moderator

Another manner in which the link between recalled positive parenting and friendship quality may be affected is through cognitive factors, such as changes in cognitions about early experiences between parents and the self. One way that these shifts in cognitions can be measured is by considering how causal attributions made for parental behaviours may positively change between childhood and adulthood, which is herein referred to as adaptive cognitive modification. Attribution theory, originally proposed by Heider (1958), and later expanded by Weiner (1972, 1974, 1985), suggests that individuals construct meaning pertaining to the behaviour of others. The attribution itself is the constructed reason or "allocation of responsibility" (Weiner, 1972, p. 203) for a behaviour or outcome. Attribution theory postulates that human beings seek to identify the reasons for which behaviours occur in order to gain a better understanding of the observed behaviour and to predict future behaviours (Shaver, 2016).

Crick and Dodge (1994) suggest that the way attributions are created inform social adjustment in childhood, where some aspects of attribution formation lead to maladaptive social adjustment, and others may lead to more adaptive adjustment. Dodge et al. (2015) conducted a study encompassing nine countries over the course of four years, in which they found that childhood reactive aggression was significantly related to the tendency to attribute hostile intent to ambiguous social stimuli (the hostile attribution bias). In contrast, adolescents who are less likely to make this hostile attribution bias in response to provocation have been documented as displaying more prosocial behaviours as compared to those who are more likely to have a bias towards attributing hostile intent (Nelson & Crick, 1999).

However, there seems to be a dearth of research regarding the way that children's attributions for the parent's behaviour influences developmental outcomes. Moreover, to the authors' knowledge, there is no research that has investigated how attributions for parents' behaviour may change between childhood and adulthood, and the implications of these changes for children's social functioning. The current study seeks to fill the gap in the literature by investigating how young adults recall the negative attributions they made for their parent's behaviour during childhood, how these attributions change in early adulthood, and how these adaptive cognitive modifications relate to the children's friendships in adulthood.

The current research takes the stance that changes in attributions may reflect a shift in social-cognitive orientations. That is, if an individual modifies their attributions for an event or behaviour, whether intentional or not, they may carry

forward this modification to different situations. This line of reasoning is commonly used in clinical psychology. For example, the seminal work of Aaron Beck (1979) on cognitive reappraisal/restructuring, and the resulting literature, illustrates that training in cognitive modification regarding the causes of negative events leads to shifts in perspectives that impact future behaviours. Theoretically, a modification of the perceptions of negative parenting behaviour may represent a shift in social-cognitive orientations. By measuring changes in attributions for negative parenting behaviour, the current research intended to investigate how adaptive cognitive modifications to perceptions of negative parenting impact the relationship between recalled positive parenting and young adults' relationships with friends.

D. Hypotheses

Based on the evidence above, the current project held several hypotheses: (1) Recalled positive parenting would be associated with more positive perceptions of current friendship quality, replicating past research, (2) mindfulness would moderate the relationship between recalled positive parenting and current friendship quality, offering an enhancing effect, and (3) adaptive cognitive modification would offer a similar enhancing effect on the relationship between recalled positive parenting and current friendship quality.

II. METHODS

A. Participants

Participants were recruited from an undergraduate psychology pool at Simon Fraser University in British Columbia, Canada. In order to be eligible to enroll in the study, participants had to be at least 17 years of age and had to have lived with a parent or caregiver until the age of 16. There were no exclusion criteria. Ninety-nine of the participants were excluded from analyses due to incomplete survey responses or because they were outliers in age, resulting in a final sample of 626 (81.5% women, Mage = 19.2 years, SDage = 2.49) to be used for analytic purposes. Participants' ethno-racial backgrounds were largely white (40.3%) and Asian (56.5%), with fewer than 3.2% reporting a different ethno-racial background from the two most frequently reported groups. See table 1 for participant demographic information.

B. Procedure

Participants signed up for the study online via the research participation system at Simon Fraser University. Once they read through the consent form and consented to participate, they were directed to a demographics questionnaire. After completion, they were prompted to complete the measures (described below). Participants completed the survey over the course of an hour and were awarded two credits that contributed to their undergraduate psychology course grade once completed. The procedures for this study were approved by the Simon Fraser University Research Ethics Board (Application Number: 30001752).

C. Recall Positive Parenting

Recalled parenting was measured using a modified version of the Parent Behavior Inventory (PBI; Lovejoy et al., 1999). The PBI measures engaged/supportive parenting, herein referred to as positive parenting. Participants were asked to rate their agreement on a 6-point Likert scale, ranging from "not at all true" (0) to "completely true" (5). The PBI was originally designed as self-report for use with parents, and as such, all questions are posed as being self-referential (e.g., "I have pleasant conversations with my child"). Since this research procedure involved rating parental behaviours retrospectively from the perspective of the child, the questions were adapted to reflect the retrospective reports from the adult child's viewpoint (e.g., "[My parent] would have pleasant conversations with me.").

D. Friendship Quality

To measure friendship quality, the Network of Relationship Questionnaire – Relationship Quality Version (NRQ-RQV; Buhrmester & Furman, 2008) was employed. The NRQ-RQV is a 30-item measure that assesses the quality of an individual's relationship across a number of social agents. In the current study, participants' relationship quality with a close friend was assessed. Participants rated their perceptions of relationship quality, ranging from "never or hardly at all" (1) to "always or extremely much" (5), on questions that address positive relationship quality, referred to by the authors as closeness. Closeness is composed of subscales made up of several questions that assess companionship (e.g., "How often do you spend fun time with this person?"), disclosure (e.g., "How often do you tell this person things that you don't want others to know?"), approval (e.g., "How often does this person praise you for the kind of person you are?"), satisfaction (e.g., "How happy are you with your relationship with this person?"), and affection (e.g., "How much does this person like or love you?"). The scores for all the closeness subscales were put together to create a mean score of participant-rated friendship quality.

E. Dispositional Mindfulness

Dispositional mindfulness was measured using the Revised Cognitive and Affective Mindfulness Scale (CAMS-R; Feldman et al., 2007), a 12-item self-report measure that has consistently been used in mindfulness literature to capture the trait mindfulness tendencies of individuals across a variety of cultures (e.g., Catak, 2012; Chan et al., 2016; Surtaro et al., 2022). The CAMS-R items are rated on a Likert-scale design ranging from "rarely/not at all" (1) to "almost always" (4). An example of some of the items on the CAMS-R include: "I am able to accept the thoughts and feelings I have" and "I can accept things I cannot change". Three items on the CAMS-R were reverse-coded (e.g., "I am easily distracted").

F. Adaptive Cognitive Modification

In order to measure adaptive cognitive modifications for parenting behaviour, a custom measure was constructed based on the Children's Relationship Attribution Measure (CRAM; Fincham et al., 1998). In the CRAM, children are supplied with negative hypothetical scenarios that most children will be familiar with (e.g. "Imagine your dad [mom] yelled at you"

(Fincham et al., 1998, p. 487)). Instead of supplying a negative scenario for the participants, participants were prompted to recall a negative event that occurred between them and a chosen parental figure/caregiver in the first 16 years of life using open-ended text responses. Importantly, the participants were required to "personally remember" the event. This note was added to the prompt because pilot testing of the question resulted in a number of responses regarding events that were told to the adult child later in life, meaning that they could not formulate an attribution for the event at the time that it occurred. Following the reporting of the negative experience, participants were asked to describe what they thought caused the event at the time that it occurred using open-ended text response.

Following these open-ended text responses, participants were asked if their thoughts about the event had changed now that they are in adulthood. If the participant responded that their thoughts have not changed, they were coded as having no adaptive cognitive modification (0). Those who responded that their thoughts had changed were prompted to explain to what/whom they now attribute the negative event to. These open-ended text responses were coded to determine the degree to which adaptive cognitive modification had occurred, described further below in the Analytic Plan section. The following were used as indicators of adaptive cognitive modification: indications of forgiveness, removal of blame from the parent, perspective taking, indications that the event ultimately produced something positive, and indications that the event was not as serious as they originally thought. These variables were coded as being present (1) or absent (0). A mean score was computed using the presence/absence coding, so the mean score for adaptive cognitive modification ranged from 0.0 to 1.0. See table 2 for frequencies of coded variables.

G. Analytic Plan

Analyses of these variables were conducted using moderation analysis through the PROCESS package for SPSS (Hayes, 2012; see figure 1). Two separate models were run, one with mindfulness acting as the moderator and one with adaptive cognitive modification serving as the moderator. Due to the use of multiple analyses, a Bonferroni correction (Dunn, 1961) was employed to control for the likelihood of making an inferential error (p = 0.025). Additionally, power analysis was conducted using G*Power version 3.1.9.7 (Faul et al., 2009) to determine the sample size needed to detect a small effect. Results of this analysis indicated that the obtained sample (N = 626) was sufficient for testing the aforementioned hypotheses to reach 80% power with alpha set to 0.025.

a. Coding for Adaptive Cognitive Modification

Of the 626 eligible participants, 394 (62.8%) indicated that their thoughts about the negative event had changed and were then asked to what/whom they attribute the event to at the present time. The remaining 37.2% of the sample was automatically assigned a code of 0, since the indication that their attributions had not changed was an indicator that no adaptive cognitive modification had occurred and were

therefore excluded from the analysis. In other words, only those who responded that their thoughts had changed had their responses coded for adaptive cognitive modification. An undergraduate research assistant was trained to identify forgiveness, removal of blame, indications that the event was not as serious as it was once perceived, indications that something positive came as a result of the event, and perspective-taking in the participants' open-ended text responses addressing their current attributions for the negative childhood event. The student was trained by the first author by coding 15 responses together first, then independently coding 209 of the 394 responses (53.1%) simultaneously with the first author. As confirmed by Syed and Nelson (2015), gold standards for narrative or open-response coding require independent coding of at least 20% of the data by two individuals; our coding plan exceeded this minimum requirement.

Coding was as follows. For explicit mentions of forgiveness, that the event resulted in something positive, and that the event was not as serious as once perceived, the variable was coded as being present in the open-ended response (1), and (0) if absent. For the perspective-taking variable, the student was trained to identify when the participant was taking on the view of the parent at the time of the event. If the participant took the perspective of the parent, the perspective-taking variable was coded as present (1) and (0) if absent. For the removal-of-blame variable, the student was trained to identify when the participant removed the responsibility for the negative event from the parent, where the blame cognition had been modified to attribute the reason for the event to be something other than the parent themselves (1). If the participant did not modify their blame attribution, the variable was coded as absent (0). Inter-rater reliability across the different coded constructs ranged from Cohen's kappas of .78 to .93, indicating excellent reliability. Discrepant coding was discussed between the first author and undergraduate research assistant. The first author then independently coded the remaining 185 responses.

III. RESULTS

Correlation analyses were conducted for all variables of interest and sociodemographic factors. Recalled positive parenting was weakly positively correlated with dispositional mindfulness, adaptive cognitive modification, and friendship quality. Mindfulness was also weakly positively correlated with friendship quality, age, and being a male. Being a female was negatively correlated with mindfulness in this sample. See table 3 for all correlations between variables of interest.

Analyses revealed a significant direct association between recalled positive parenting and current friendship quality (b = 0.067, SE = .026, p = 0.009, 95% CI [.016, .118]), but not between dispositional mindfulness and current friendship quality (b = .104, SE = .070, p = 0.136, 95% CI [-.033, .241]). The interaction term (recalled positive parenting x dispositional mindfulness) revealed a moderating effect of mindfulness on the relationship between recalled positive parenting and positive social relationship quality (b = .150, SE = .050, p = 0.003, 95% CI [.052, .248]), such that when dispositional mindfulness was moderate to high, the

association between recalled positive parenting and friendship quality was enhanced, whereas there was no effect of mindfulness on the association when dispositional mindfulness was low. See table 4 for direct and interaction effects, and figure 2 for a graphical representation of the interaction effect.

Using the same PROCESS model described above, adaptive cognitive modification was also examined using moderation analysis. While moderation analysis revealed a direct effect of recalled positive parenting on friendship quality (b = .070, SE = 0.30, p = .011, 95% CI [.011, .129]), adaptive cognitive modification did not show significant direct effects (b = .016, SE = .051, p = .744, 95% CI [-.084, .116]). The interaction effect of adaptive cognitive modification on the relationship between recalled positive parenting and friendship quality was also found to be not statistically significant (b = .066, SE = .041, p = .107, 95% CI [-.014, .146]).

IV. DISCUSSION

The present study aimed to investigate how dispositional factors, such as mindfulness, and cognitive factors, such as adaptive cognitive modification, impact the association between recalled positive parenting and friendship quality. The above findings indicate that there is a direct relationship between recalled positive parenting and young adults' friendship quality, where increases in recalled positive parenting predicted increases in friendship quality. This was an expected finding, as it replicates past research that has demonstrated the effect of recalled positive parenting during childhood on friendships in adulthood (Alegre & Benson, 2019; Black et al., 2007; Wise & King, 2008).

The current research intended to extend these findings by investigating how both dispositional mindfulness and adaptive cognitive modification moderate this relationship. Findings demonstrated that mindfulness moderated the relationship, such that the link between recalled positive parenting and friendship quality was enhanced when levels of dispositional mindfulness were higher. Given the definition of mindfulness – non-judgemental present-oriented awareness and focus (Kabat-Zinn, 2003) – there are several ways this effect can be interpreted. For one, an individual who has high levels of dispositional mindfulness may be less inclined to judge the behaviours of others as being hostile or negative. An example of this is the finding that decentring, a core principle in mindfulness, is related to decreases in hostile attribution bias in ambiguous social situations (Schans et al., 2020). This is in line with research that has previously shown that mindfulness serves as a protective factor against ruminative thought patterns and negative automatic thoughts (Ayhan & Kavak Budak, 2021; Raes & Williams, 2010). Such findings may be a product of the mindful individual's tendencies to observe inner and outer experiences non-judgementally (Baer et al., 2006). This quality present in highly mindful individuals may allow for the recollection of more positive parenting. In turn, such recollections may carry over into the tendencies brought to friendships, where the mindful individual's social qualities are grounded in the recollections of positive parenting that are formed by non-judgmental observation. Such an individual may use the same observing and non-judgmental qualities to perceive higher quality of friendships by avoiding the use of maladaptive social inferences such as attributions of hostile intent.

Another explanation for the effect of mindfulness on the relationship between recalled positive parenting and friendship quality stems from research focused on emotion regulation. Research has consistently found that individuals who are highly mindful are more likely to use adaptive emotion regulation tactics (see Chambers et al., 2009 for review). There are several ways in which these emotion regulation skills in highly mindful individuals may foster the development and maintenance of higher-quality friendships. For one, the core tenet of mindfulness that focuses on non-reactivity to and non-judging of experiences may halt emotional reactivity in response to a perceived slight from others. This ability to move past negative emotions that arise as a result of less-than optimal social interactions likely allow the individual to perceive their friendships as being more positive, since they do not dwell upon the negative aspects of the relationship.

The differences in perceptual and emotional processes between low- and high-mindful dispositions outlined above likely relate to distinct patterns of behaviour in the context of interpersonal relations. Conflict and the resolution of conflict, for example, are inherent parts of maintaining a relationship (Canary et al., 1995). The tendency of those with high levels of dispositional mindfulness to perceive the behaviours of others as being more favourable likely influences how conflict is approached, thus resulting in differences in relationship quality as a function of the levels of mindfulness present in the individuals within the social situation. Additionally, the emotion regulation skills that are associated with a mindful disposition likely impact the way the conflict unfolds. These assertions are evidenced by previous literature that has illustrated that individuals who have high dispositional mindfulness have a tendency for constructive methods of conflict resolution such as engaging in dialogue to resolve interpersonal issues, while also avoiding destructive methods such as withdrawal and escalation (Mandal & Lip, 2022). Such differences in relationship maintenance strategies possessed by highly mindful people likely contribute to their perception of positive friendship quality.

While dispositional mindfulness showed a moderating effect on the association between recalled parenting and positive relationship quality, adaptive cognitive modification did not have a significant moderating effect. Until this point, changes in attributions for parenting behaviours had not been investigated, meaning that the role of adaptive cognitive modification in the relationship between recalled parenting and friendship quality was unclear. The current findings suggest that adaptive cognitive modification is not of note in the relationship between recalled positive parenting and friendship quality. There are several reasons for which this may be the case. One possible explanation for the non-significant findings is that changes in thought about an event

that occurred in the past may not accurately represent a tendency for such change. For example, the re-evaluation of an attribution that removes blame from an individual does not mean that the person modifying their attributions will remove blame in the same way in future situations with different people. Similarly, forgiving one individual for a past transgression may not be reflective of the inclination to forgive other individuals in the present.

Another way to explain the non-significant finding of the current research is by examining the differences between parent-child relationships and friendships. Since the relationships themselves exist in different domains, the modifications of attributions for one may be inherently distinct from the modification of attributions for the other. For example, negative events between a parent and a child can often be perceived differently as a product of age, wherein the child comes to recognize the legitimacy of the parent's perspective as they grow older (Canary et al., 1995). Attributional modifications for negative events between friends, however, do not have the same temporal aspect. Thus, the changes in attributions for parenting behaviours may not occur the same way in friendships, meaning that adaptive cognitive modification for parenting behaviours would not be predictive of friendship quality.

It is also possible that the modifications to attributions for parenting behaviours have already been accounted for by recalled positive parenting. The modification to these attributions may very well inform the way that parenting behaviours are remembered, meaning that the adaptive cognitive modification construct is inherently linked to the recollections of positive parenting. If an individual has adaptively modified the attribution for a negative event between themselves and their parent, they may have already internalized this interpretation, and this internalization may impact the way that positive parenting is recalled. For example, if an attribution for an argument between an adolescent and a parent about staying out late has been modified to reflect an understanding of the concerns of the parent for the adolescent's safety, then an internalization of such an understanding may influence the way that other events during childhood are perceived and remembered. This would explain why adaptive cognitive modification did not moderate the relationship, since attributional change for parenting behaviours was confounded by the recollection of parenting.

A. Limitations and Future Directions

Conclusions drawn from this research must be interpreted with consideration of some limitations. For one, it was not possible to attain real-time attributions and parenting behaviours during childhood. Instead, participants relied on the memories of these variables and reported based on recollection. Researchers frequently question the validity of using retrospective reports of childhood memories (e.g., Halverson Jr., 1988). However, the current research did not intend to supplement longitudinal data with cross-sectional data in order to establish associations with developmental trajectories. Instead, the current research was strictly

interested in describing the relationship between recollections of parenting behaviour and friendship quality, and not the parental behaviours themselves. To establish a causal link between parenting behaviours, childhood attributions, and friendship quality, future research should attempt to obtain attributions for parenting behaviour as they occur (i.e., during childhood) and investigate how these attributions change over time for a more reliable adaptive cognitive modification construct.

Another limitation of the present study involves the demographic factors of the sample. The recruited sample had a significant overrepresentation of women (81.5%) and Asian-background individuals (56.5%). Previous literature has demonstrated that young women's recollections of family environment are more strongly predictive of friendship quality as compared to young men's recollections (Wise & King, 2008). Similarly, cultural differences have been found in how mindfulness scales and parenting scales perform in different societies (Karl et al., 2022; Rodriguez et al., 2023). Future work may explore these demographic components in examining the proposed links in this study.

Also, this research used an undergraduate sample. It is well-known that undergraduate samples are not representative of a particular society or culture, meaning that the results of studies using such samples may have poor external validity. In addition, the results of the current study were obtained using cross-sectional data. Cross-sectional studies limit the degree of causality that can be inferred using data, meaning that this dataset cannot establish a model of cause-and-effect. In order to establish such a link, future research should consider using time-series or even longitudinal data to allow for the drawing of stronger conclusions.

There are also some limitations in the way that specific constructs were measured in the present research. Participants were asked to freely recall a negative event that occurred between themselves and their parent during childhood. The rationale behind this decision was to have participants report an event that is most salient to them, which in theory has a higher likelihood of informing current social behaviours. However, proceeding in this way also has its limitations. Participants may have been influenced to respond to the prompts in a way that makes themselves seem "in the right" in the situation described. This may well be the case for the 38.2% of participants who indicated their thoughts about the negative event had not changed. It is possible that these individuals purposefully chose a situation in which they want to be perceived as being correct, thus validating their thoughts about their own perception of the event. It is also important to note that the PBI (Lovejoy et al., 1999) was modified in the present research to reflect retrospective reports of parenting from the perspective of the adult child. While Lovejoy and colleagues (1999) validated the original scale and its items, a re-validation is warranted to be certain that the modified scale remains psychometrically sound.

There are many other dispositional and cognitive factors beyond mindfulness and adaptive cognitive modification that may impact the relationship between recollections of positive

parenting and friendship quality. Future studies may further the current research by investigating how such factors influence this relationship. Additionally, attributional change for parenting behaviours is a novel concept, and future research on how it relates to other constructs may be interesting. For example, future research may consider how adaptive cognitive modification relates to quality of adult relationships with their parents and the way that individuals find meaning in their life experiences.

V. CONCLUSION

The present findings highlight the importance of consistent positive parenting throughout childhood, which may in turn relate to stronger friendship quality. Moreover, having high levels of mindfulness appears to allow these individuals to capitalize on their recollections of positive parenting. Our findings emphasize the importance of incorporating extra-dyadic factors when investigating the links between parenting and social functioning outcomes in order to further elucidate the complex inter-relations between parenting and social competence. Although further research is needed, these findings also highlight mindfulness as a potentially critical factor that can be trained among youth using interventions (Dai et al., 2022) and parenting practices (Kil et al., 2023) to boost the downstream effects of receiving positive parenting on youths' later social functioning.

APPENDIX

TABLE I.   SOCIODEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS.

	N	%	M	SD
Gender				
Male	99	15.8		
Female	510	81.5		
Other	17	2.7		
Race/Ethnicity				
White	252	40.3		
Asian	354	56.5		
Other	20	3.2		
Age			19.2	2.49

Note. Under the race/ethnicity heading, "other" refers to participants who were Black, Native Pacific Islander, American Indigenous, Hispanic, or multiracial. "Other" under the gender heading refers to participants who indicated they were a third gender (non-binary, genderfluid) or transgender.

TABLE II.   FREQUENCY OF CODED VARIABLES.

	Frequency	%
Removal of blame	152	38.57
Forgiveness	43	10.91
Perspective taking	241	61.16
Seriousness	26	6.59
Good Event	31	7.86

Note. "Seriousness" is representative of indications that the event was not as serious as once perceived, and "Good Event" is representative of indications that something positive came as a result of the event.

Figure 1. *Model of Moderation Analyses*

Analysis 1: Mindfulness   Analysis 2: Adaptive Cognitive Modification
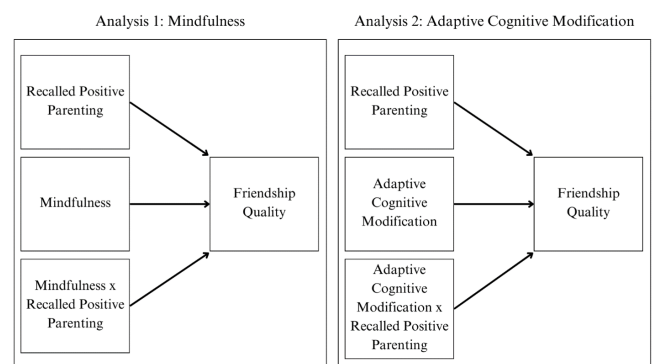
TABLE III.   PEARSON'S CORRELATION TABLE.

	a	b	c	d	e	f
(a) Positive Parenting	-					
(b) Mindfulness	.288**	-				
(c) Adaptive Cognitive Modification	.166**	.024	-			
(d) Friendship Quality	.141**	.083*	.014	-		
(e) Age	-.013	.118**	.001	-.144		
(f) Male	.008	.181**	-0.55	-.123	.150**	-
(g) Female	-.009	-.155**	.006	.121	-.122**	-.921**	-

Note. *= Significant at the 0.05 level; **= significant at the 0.01 level.

TABLE IV.   MODERATION EFFECTS OF IVS ON THE DV.

	b	SE	p	t
Positive Parenting	.067	.026	.009	2.609
Mindfulness	.104	.070	.136	1.493
Mindfulness x Positive Parenting	.150	.050	.003	2.991
High Mindfulness	.135	.036	<.001	3.744
Moderate Mindfulness	.073	.024	.006	2.789
Low Mindfulness	-.002	.033	.943	-.072

Note. Positive parenting and mindfulness have been mean-centered.

Figure 2. *Johnson-Neyman Plot of Regions of Significance*
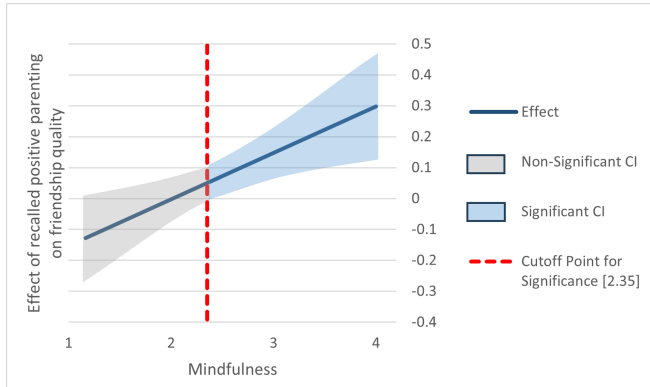
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Investigating Eyewitness Behaviour and Accuracy using Eyewitness Descriptions

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Abstract— **While research surrounding eyewitness identification has flourished and continues to expand, there seems to be limited knowledge and research regarding eyewitness description and whether the detail within a given description has an impact on eyewitness accuracy. This paper reviews past literature of verbal overshadowing effect – a phenomenon that describes the act of verbally describing an item (a face, an event) will impair future memory and recognition of that item. Research surrounding verbal overshadowing effect has shown benefits such as improved performance during lineup identification while other research has illustrated weakened memory and recollection. With that said, this paper conducts a study that reviews real life eyewitness descriptions from Austin Police Department and extrapolates its data. Our study serves to provide clarity and a more in-depth understanding of what type of descriptors eyewitnesses provide and if the level of detail helps performance in lineup identification.**

Keywords— *Eyewitness Identification, Forensic Psychology, Verbal Overshadowing Effect*

I. Investigating eyewitness behaviour and accuracy using eyewitness descriptions

If you have ever witnessed a crime, you know that your memory of the event becomes a source of evidence. At some point, you will be asked to describe the event, including what you saw and the appearance of the person(s) who committed the crime – the perpetrator(s). However, this is not always an easy task, as empirical findings have concluded time and time again. People naturally vary in their ability to remember details of an event, or the people present, and if the witness did not get a good look at the perpetrator or their ability to create a memory was impaired in some other way (i.e., intoxication, stress), remembering and describing what happened or the people involved becomes even more difficult. Other factors that can contribute to memory fallibility include systems variables; variables that are controlled by the legal system, such as lineup instructions or administration of lineups and estimator variables which are variables that have no control by the legal system, such as witness' memory, exposure level of the perpetrator during the crime (Cutler et al., 1987).

When identifying the perpetrator is a key part of the investigation, eyewitnesses will often be asked to participate in procedures that are used to test whether the police suspect – a person of interest for the crime is the person the eyewitness saw commit the crime (Wells & Luus, 1990). The eyewitness identification procedures can be a showup - a single suspect presented to the eyewitness - or a lineup - an array of individuals or photos of individuals shown to the eyewitness. Lineups are a police procedure recommended by researchers because the police suspect is embedded among similar looking people who are known to be innocent also called fillers. This means that these similar looking people can draw away errors resulting from weak memory or a willingness to choose even when uncertain so that they do not always result in a misidentification of an innocent suspect, as would be the case if a showup procedure is used. So, when lineups are conducted in line with best practices (see the Wells et al., 2020, Scientific Review Paper), the chance of incriminating an innocent suspect or a wrongful conviction is reduced.

Thus, it is not unusual for eyewitnesses to be asked to look at a lineup and indicate if the person that they saw commit the crime is in the lineup. Depending on the quality of their memory and what has happened since the crime, they may or may not be able to do this. Eyewitness memory is fallible, so their identifications, their descriptions, or even their recognition can be wrong. They could fail to recognize the perpetrator or identify a filler, which can have dire consequences. However, it seems likely that a detailed description might reflect a high-quality memory of the perpetrator they saw. That is, if an eyewitness can provide a lot of information about the perpetrator's appearance, that would indicate they have a good memory for that person's face. Perhaps the ability to recognize someone is associated with the ability to describe their appearance well from memory.

Wells (1985) conducted research to investigate if there is a difference between eyewitnesses who are "good describers" versus "good identifiers". This research included 176 undergraduate students that were randomly assigned to view a photograph of an individual (the target) that was either three-quarter pose – face was partially shown or straight pose – whole face was shown. Participants were then tasked to provide a description of the photograph they viewed, followed by a lineup identification task. The results indicated that faces that are described more efficiently are identified better; however, having a completed description had no correlation to description accuracy or congruency. Results also showed that congruent descriptions and accuracy are strongly related. Wells (1985) concluded that there is no relationship between an eyewitness who is good at describing with one that is good at identifying (Well, 1985).

II. verbal overshadowing effect

Considering eyewitness descriptions hold importance to different stages of a criminal investigation, it is vital to understand what studying eyewitness description and verbal description can offer not only to the research but also to the application of real-world events. There has been an on-going

debate on the effects of verbal description; on one side of the debate, it is argued that the act of describing an item (i.e., face, event) impairs memory of that item. A phenomenon known as verbal overshadowing effect (VOE), first studied by Schooler and Engstler-Schooler (1990), had participants watch a mock robbery video and were assigned to either complete a mundane task or provide a written description of the perpetrator. Participants were 25% less likely to select the perpetrator when they had to provide a description. In other words, when individuals verbally described the target's face, their memory and recognition of that described face deteriorated. With similar methodology, Alogna and colleagues (2014) were able to replicate Schooler and Engstler-Schooler (1990) and found that verbal description impaired participants' recognition. Recognition was impaired even more when participants did the lineup selection immediately after providing a verbal description (Alogna et al., 2014).

However, both studies were designed with target-present lineups only, therefore, they could only look at this effect in the context of correct identifications and misses, but not false identifications. That is to say, the study design did not account for if the participants were to select a filler, which if it happened in the real world could lead to a wrongful conviction. The reason behind the low rate of identification could be because of a reduced discriminability or because responses are more conservative after giving their description (Mickes, 2016).

Other research that has attempted to replicate VOE seems to have results that contradict VOE. For instance, Memon and Rose (2002) had a classroom of students aged 8-9 years old introduced to a confederate who informed the class that his dog was missing and had a picture of the dog shown to each student. Twenty-four hours later the students were randomly assigned to either provide a description or not. Though there was no verbal overshadowing effect found, participants were more likely to make a correct decision in the lineup where the target was absent. These results indicate that children can make correct identifications after a verbal description without memory being affected. This can carry great importance in the justice system.

Similarly, Meissner and colleagues (2000) found that though the literature surrounding VOE holds inconsistencies, perhaps given the proper circumstance we could see VOE. They explained that if participants were asked to make an identification immediately following the description that VOE is more likely to occur, however further research is needed to determine this (Meissner et al., 2000). There were several explanations offered for the mixed results in the literature. For example, one could make the argument that eyewitnesses do not know that they are about to witness a crime and subsequently give a description. In contrast, when conducting laboratory-based research, participants know that they would be asked to give a description;(i.e., Brown et al., 2010; Brown & Lloyd-Jones, 2005, 2006; Nakabayashi, Lloyd-Jones, et al., 2012; Wickham & Lander, 2008). The difference between research and the real world puts researchers at a disadvantage for understanding VOE.

The other side of the debate suggests that perhaps there could be benefits when it comes to verbal descriptions. Most of the research that illustrates the benefits of VOE reflect the "more is better hypothesis" – in the context of eyewitness description, it elucidates that the more details in an eyewitness description results in a greater likelihood of an accurate identification (Jones et al., 2013). Jones and colleagues (2013) were able to illustrate that the more features described by the participants, the better the outcome - these participants tended to have a higher hit rate. They also found that generating a description of the perpetrator during the "study" phase was beneficial for the recognition and decision phase (Jones et al., 2013). This not only contradicts the argument that the act of verbal description is harmful to memory but also further illustrates the benefits in verbal descriptions, because it would characterize that the act of verbal rehearsal is beneficial to memory.

Another study by Sporer and colleagues (2016) sought to use context reinstatement techniques to improve the accuracy of participant decisions. They asked participants to re-read their own descriptions before completing the identification process. Participants were at least three times more likely to make a correct decision when the participants were encouraged to read their descriptions prior to the identification procedure, especially if the target was absent and the participants needed to reject the lineup to be accurate. However, it should be noted that the benefits of re-reading the description will depend on the quality (accuracy) and quantity (level of detail) of the elements of the description - a bad description does not produce the benefits observed (Sporer et al., 2016). Also, in real life cases, police officers do not know if the eyewitness description is accurate, so the benefits of re-reading the description cannot be tracked in this way.

Existing empirical data show that familiar faces are recognized faster, and people can remember familiar faces for longer than unfamiliar faces (Scapinello & Yarmey, 1970; Ellis, Shepherd, & Davies, 1979). Wickham and Lander (2008) further investigated potential benefits and determinants of VOE, however they wanted to explore the effects of VOE using familiar faces. Participants were randomly assigned to one of three conditions when asked to describe faces; holistically - descriptions about what kind of person the target looked like such as occupation or personality. Another condition was featural - descriptions of facial features such as eyes, nose, hair, etc., or no description. Faces that were described holistically were better identified by participants compared to featural or no description. There was no verbal overshadowing effect found. While the results elaborate that there are different ways of describing a face that are superior to the traditional way (featural), it is unrealistic for law enforcement to ask witnesses to describe what kind of person the perpetrator looked like in real cases.

Furthermore, Osborne and Stevenage (2013) divided familiarity into three categories; famous faces, newly learned faces and unfamiliar faces and investigated different processing styles. Participants were randomly assigned to one of the three categories and found that despite the level of familiarity of the target face, holistic processing - the whole face is processed at once - led to a demonstrably better performance than relational processing - features or certain regions of the face. Finally, Mickes (2016) conducted a meta-analysis on VOE and concluded that the empirical findings are too mixed. Thus, there is not enough information on VOE to

give guidance or recommendations to practice in the criminal justice system. As it stands, research surrounding eyewitness identification is extensive, and nuanced, however all the research reviewed in this paper enhances our understanding of memory, judgement, accuracy, and confidence. The variability of the results can also extend to the variability of people and how they function and behave. Understanding the current landscape of what the research says can further help us turn towards the direction of research that is needed. So far, there is no definitive prove of whether verbal description can be harmful or beneficial.

III. EYEWITNESS DESCRIPTIONS IN THE JUSTICE SYSTEM

For almost four decades, there has been substantial research done to clarify our understanding of how to collect reliable eyewitness evidence. Research surrounding eyewitness evidence has been able to establish that, in exoneration cases, the leading factor that can result in wrongful convictions is eyewitness evidence (Innocence Project, 2017; National Registry of Exonerations, 2024). Despite provisions embedded in the judicial system to prevent errors when collecting eyewitness evidence such as the Sophonow Inquiry, there remains reluctance. The Sophonow Inquiry report was released in 2001, and it documents several recommendations on conducting police lineups to reduce eyewitness errors. Mainly, the judicial system in Canada have held reluctance to permit expert eyewitness testimony in court because it is deemed "unnecessary" or "redundant" (Public Prosecution Service of Canada, 2011), but there have been high profile cases in which the Sophonow Inquiry recommendation was applied to assess eyewitness identification reliability (R v. Longman, 2013).

Research has established that eyewitness evidence is perhaps the most common type of evidence relied on by prosecutors and defense attorneys. Each year in the United States, at least 77,000 criminal cases' primary source of evidence against the defense is eyewitness testimony (Wells, et al., 1998). There have been reforms placed that improve eyewitness identification and have been supported by organizations such as the U.S. Department of Justice, and the American Bar Association to name a few (Innocence Project, 2017). Wise and colleagues (2009) wanted to understand the level of knowledge defense attorneys and prosecutors held regarding eyewitness identification. 1100 defense attorneys and 73 prosecutors completed questionnaires asking about eyewitness evidence, their beliefs regarding how much judges, juries, police officers, and attorneys know about eyewitness testimony.

Defense attorneys were more knowledgeable about eyewitness testimony, they were more likely to have eyewitness experts, there was more skepticism surrounding eyewitness testimony. Whereas prosecutors were more reluctant to use expert testimony to educate jurors on eyewitness evidence and overestimated the knowledge jurors had on eyewitness testimony (Wise et al., 2009). However, reluctance to use expert testimony could be because it would not benefit their case for jurors to understand the importance of expert testimony. Prosecutors were unaware that having an expert witness is a legal safeguard that can result in effectively educating jurors (Wise et al., 2009). While prosecutors' and attorneys' knowledge of eyewitness identification is inconsistent, unfortunately the same can also be said about judges.

Over 247 Canadian cases were reviewed that included discussion regarding reliability of eyewitness identification (Bruer et al., 2017). Results show that judges rarely discussed recommendations (i.e., Sophonow Inquiry), in so doing would empathize factors that would have influence on reliability of eyewitness memory (Bruer et al., 2017). The purpose of this study was to understand if Canadian judges applied the empirical findings regarding eyewitness identification in the cases they preside over. This was surprising given that the Supreme Court of Canada had emphasized that, as triers of fact, judges should be aware of the research-based recommendations surrounding eyewitness evidence. Bruer & colleagues (2017) conclude a few possibilities for this particular finding: (1) it could be possible that Canadian judges are just not aware of the potential consequences or influence that certain variables have on eyewitness evidence, (2) that judges do not think certain influences apply to the case they are handling, or (3) that judges do not believe that the particular eyewitness evidence in this case is not concerning, so it is not included in their decision (Bruer et al., 2017).

IV. THE CURRENT STUDY

There are many existing research studies that address different areas of eyewitness identification such as lineup size, the relationship between eyewitness confidence and accuracy. However, there is very little published about eyewitness descriptions, more particularly whether the level of detail in a description could predict accuracy in a lineup. The purpose of this study is to explore if details within an eyewitness description can provide further understanding into collecting reliable eyewitness evidence. In conducting this study, we aim to answer the following question: does the number of details and the type of details provided by an eyewitness description predict the nature of their recognition judgments?

Research has indicated that eyewitness descriptions commonly include five variables; gender, age, race, height and a description of hair (Wells et al.,2000). We have determined that descriptions that have five or more variables will have a higher likelihood of an accurate selection [Hypothesis 1]. Accuracy would entail that the eyewitness correctly rejected the lineup, therefore indicating that the suspect is not in the lineup, it could also mean that the eyewitness correctly selected the suspect – a person of interest for the crime. In contrast, general or vague descriptions such as build, height, gender are likely to be associated with incorrect lineup rejections or a filler selection [Hypothesis 2]. Finally, descriptions that include very specific details such eye color, tattoo, or distinctive facial features will be associated with a correct selection - identifying the suspect [Hypothesis 3].

V. METHOD

A. Participants

This study includes data files from Austin PD (N=204), cases include data of eyewitnesses to real crime. Case files that did not include a description were not included in the final data analysis, (N=57).

B. Design

Ethics approval for this minimal-risk study was obtained from Simon Fraser University Research Ethics Board (REB Certificate Number: 30002260). The design for this study was an archival data analysis; police files were examined where an eyewitness provided a description and was followed by a lineup. Since the aim of this study was to determine if there is a cause-and-effect between description and accuracy, our study is also quasi experimental.

C. Procedure

A spreadsheet was used to code the items included in a description, these include general variables such as age, race, height and build. But we also wanted to include details we thought would be uncommon or that would illustrate that the eyewitness had good memory and had a good look at the perpetrator such as scars, marks, or tattoos and distinctive facial features. The intention behind coding the description was to be very specific, so that certain variables do not overlap. For example, race and complexion were coded as two separate items because complexion would refer to skin tone but not necessarily race. Other variables such as distinctive facial features would refer to prominent features of the face such as "bumpy nose", "eyes far apart" or "thin lips". We also had a second coder to ensure consistency and reliability in our criteria and to account for any discrepancies. Other items that were coded included the eyewitness' selection of the lineup which was restricted to "no selection", "suspect", or "filler". It is important to note that because these are real eyewitnesses, we do not know whether the suspect was the true perpetrator, so suspect identifications and rejections of the lineup might be incorrect. But we are still treating suspect identifications as a "pseudo correct" response. Rejections are a "pseudo correct" response as well for similar reasons. We also wanted to know if the description was accurate to the suspect in question, so we had another column; "description accuracy" and based on the coders subjective view coded Y for "yes" and N for "no". In the appendix is a table (Table 1) of the variables coded alongside their definitions of how they were coded.

There were discrepancies on whether build and weight should be coded the same and concluded that each coder would code based on their separate opinion. For example, coder A would code the following descriptor "chubby" as both build and weight, while coder B would code for only build. These were discrepancies that both coders had to resolve by creating two separate coding criteria to check back at the end of the coding process. Another discrepancy that needed to be resolved was coding the time when the eyewitness report was taken, for example, 2:30 am can be recorded as both night and morning. To resolve these discrepancies both coders reviewed their initial assessment to reach a consensus. Once the discrepancies were resolved, the dataset was cleaned up. The clean dataset was then put through *Rstudio* where we were able to get the percentages of the descriptions that had varying information.

VI. RESULTS

Results were gathered and based on three subsets; 1) descriptions from eyewitnesses who identified the suspect (n = 131), 2) descriptions from eyewitnesses who identified a filler (n = 18), and 3) descriptions from eyewitnesses who rejected the lineup (n = 55). Point of caution, subset 2 has a low sample size, therefore, we will not mention the effects yet. The eyewitness selection was dummy coded into 3 variables; 1) suspect if the eyewitness selected the suspect, 2) filler if the eyewitness selected a filler, and 3) rejection if the eyewitness rejected the lineup. All three variables were run through 3 logistic regressions with the different descriptions as categorical predictors.

From the suspect pick results, we were able to obtain the following: when the eyewitnesses included build into their description, they were 3 times more likely to pick the suspect than to reject the lineup or pick a filler (B = 1.22, p = 0.015, OR = 3.39). When eyewitnesses included scars, marks, tattoos in their description, they were less likely to select the suspect than to just reject the lineup or select a filler (B = -3.19, p = 0.008, OR = 0.04). This might suggest that eyewitnesses are perhaps more focused on a particular mark that would make them easier to identify and more distinct than others.

When the eyewitness included complexion in their description, the eyewitness was more than 5 times more likely to reject the lineup than to select a filler or the suspect; (B = 1.54, *p* = 0.007, OR = 4.66). This finding could potentially mirror similar reasoning to the findings above regarding scars, marks, and tattoos, and that perhaps eyewitnesses are so focused on the specificity of the complexion other factors such as lighting could influence their decision; lighting during the crime, lighting during lineup could be different than what they remember. When the description included build, the eyewitness was less likely to reject the lineup (B = -1.64, *p* = 0.003, OR = 0.19).

In the appendix is a figure (Figure 1) that represents the percentage of each variable in the eyewitness descriptions. Race was the most common detail mentioned among suspect pick, rejection and filler pick; an average of 95% on all descriptions coded. Other common variables in the descriptions are age, height, hair, and build, which are relevantly basic features. However, it seems that the more detailed the variable gets, the less common it becomes in the description. For example, describing build was more popular in all three types of picks than describing weight.

VII. DISCUSSION

The rationale behind this study was to investigate if eyewitness descriptions have a cause-and-effect relationship with lineup accuracy. We initially anticipated detailed and specific variables, such as eye colour, distinctive facial features (nose, forehead, or chin) in the eyewitness descriptions. However, many descriptions had general and vague variables, such as race, height, and gender. This is echoed by research that has determined that on a typical description there are five variables that are collected; gender, age, race, height/build and some description regarding hair (Wells et al., 2000). If the eyewitness is pushed for more details, then there is risk of guessing details or having low accuracy during the identification process (Wells et al., 2000). While we cannot say for certain whether eyewitnesses were pushed for descriptions by law enforcement, descriptions that did have more details and ones that are specific did not predict

accuracy.

We also determined three hypotheses; hypothesis 1 stated that descriptions that have five or more variables will have a higher likelihood of an accurate selection. This hypothesis was not supported, based on our results having included height, race, hair, distinctive facial features on the descriptions was not associated with if the eyewitness was going to reject the lineup, pick a filler or select the suspect. Hypothesis 2 stated that general or vague descriptions are likely to be associated with lineup rejections or a filler selection, this hypothesis was not supported because eyewitnesses were less likely to reject the lineup if they included build in their description. Lastly, hypothesis 3 stated that descriptions that include very specific details such eye color, tattoo, or distinctive facial features are more likely to be associated with a correct selection of the suspect. Our results do not support this hypothesis; the more specific details given such as scars, marks and tattoos, the less likely the eyewitness would select the suspect. However, we cannot say with certainty that hypothesis 3 is unsupported by our results because when complexion which is a specific detail comes up on a description, the eyewitness is more likely to reject the lineup. Past research has indicated that pigmentation is an important characteristic in episodic face recognition (O'Toole et al.,1999).

One possible explanation for our results could be explained by verbal overshadowing effect. Despite the level of details and the number of variables provided, it did not provide clarity for predicting lineup accuracy, perhaps the act of verbally describing the perpetrator deteriorated the witness' memory of the perpetrator's face. While the research shows mixed results with VOE, our results could provide motivation for other researchers to further explore these two factors as it related to eyewitness identification. Much of the research on VOE that was reviewed in this paper have similar methodologies; participants watching a mock crime video then asked to verbally describe the perpetrator followed by a lineup. Our study had an advantage in that the participants were witnesses to real crimes and thus experienced different stages of a criminal investigation; therefore, this study holds ecological validity – our findings can be generalized to real world settings. Despite our hypotheses not being supported, this study could help eyewitness literature by capturing a clearer picture of forensic science and practicing proper collection of eyewitness evidence.

Our study came across a few limitations that need to be considered, for instance, this study was completed as part of a directed studies project, therefore our team had a short period to code through as much APD eyewitness descriptions in the lotted time. Another limitation was our final sample size; many of the APD files did not include a description and while we cannot say with certainty whether a description was collected and not recorded or just not collected, cases without a description were not included in our sample which reduced our final sample size. However, for future research, our team plan to code and further analyze the remaining APD files to gain a better understanding of a cause-and-effect relationship between eyewitness descriptions and accuracy.

The criminal justice system relies heavily on the verbal recollection of crimes and perpetrators from the eyewitness, and while eyewitness descriptions provide a benefit to the public and law enforcement in solving criminal investigations, we do not know if an eyewitness' own description could serve as a benefit during the identification stage. Eyewitness descriptions mainly have been known to help create a sketch of the perpetrator, warning the public of a potentially dangerous criminal and using descriptions to create a proper lineup. But little to no examination has been done to understand if eyewitness descriptions could help eyewitnesses. Perhaps future research could delve into understanding if there are any benefits that descriptions can provide for the eyewitness.

VIII. APPENDIX

TABLE I.   EYEWITNESS DESCRIPTION VARIABLES.

Variable	Definition
Height	1=variable in description 0= not in description
Weight	1=variable in description 0= not in description
Build	1=variable in description 0= not in description
Hair	1=variable in description 0= not in description
Age	1=variable in description 0= not in description
Race	1=variable in description 0= not in description
Complexion	1=variable in description 0= not in description
Distinctive Facial Features	1=variable in description 0= not in description
Scars, Marks, Tattoos	1=variable in description 0= not in description

TABLE II.   LOGISTIC REGRESSION EVALUATING FEATURES OF DESCRIPTIONS MADE BY EYEWITNESSES WHO IDENTIFIED THE **SUSPECT** FROM THE LINEUP.

Description Element/Feature	Parameter Estimate (B)	*p* value	Odds Ratio (OR)
Age	-0.50	0.249	0.61
Height	0.38	0.426	1.46
Race	-1.18	0.183	0.31
Complexion	-0.84	0.127	0.43
Hair	-0.40	0.392	0.67
Build	1.22	0.015*	3.39
Weight	0.11	0.842	1.12
Facial Features	0.15	0.822	1.16

Description Element/Feature	Parameter Estimate (B)	p value	Odds Ratio (OR)
Scars, Marks, or Tattoos	-3.19	0.008*	0.04
Distinctive Features	2.31	0.016*	10.07

Note: * Indicates effects that are significant at the $p = 0.05$ level.

Our sample size for filler picks were small ($n = 18$), therefore, the description elements were not associated with if the eyewitness selected a filler or not.

TABLE III.   LOGISTIC REGRESSION EVALUATING FEATURES OF DESCRIPTIONS MADE BY EYEWITNESSES WHO IDENTIFIED A **FILLER** FROM THE LINEUP.

| Description Element/Feature	Parameter Estimate (B)	p value	Odds Ratio (OR)
Age	-0.12	0.823	0.89
Height	-1.09	0.076^	0.34
Race	0.37	0.741	1.45
Complexion	-1.98	0.075^	0.14
Hair	0.73	0.207	2.08
Build	0.34	0.555	1.40
Weight	0.11	0.887	1.12
Facial Features	-0.41	0.668	0.66
Scars, Marks, or Tattoos	0.94	0.388	2.56
Distinctive Features	-1.38	0.209	0.25

Note: ^ Indicates effects that are significant at the $p = 0.10$ level. Note that the sample size here is very small ($n = 18$) so these results should be interpreted with caution.

TABLE IV.   LOGISTIC REGRESSION EVALUATING FEATURES OF DESCRIPTIONS MADE BY EYEWITNESSES WHO **REJECTED** THE LINEUP.

Description Element/Feature	Parameter Estimate (B)	p value	Odds Ratio (OR)
Age	0.88	0.048*	2.41
Height	-0.10	0.837	0.90
Race	0.46	0.605	1.58
Complexion	1.54	0.007*	4.66
Hair	-0.27	0.566	0.76
Build	-1.64	0.003*	0.19
Weight	-0.07	0.896	0.93
Facial Features	0.22	0.752	1.25
Scars, Marks, or Tattoos	2.00	0.045*	7.39
Distinctive Features	-1.38	0.127	0.25

Note: * Indicates effects that are significant at the $p = 0.05$ level.

Figure 1.   *Description Variables and Lineup Selection Frequency*
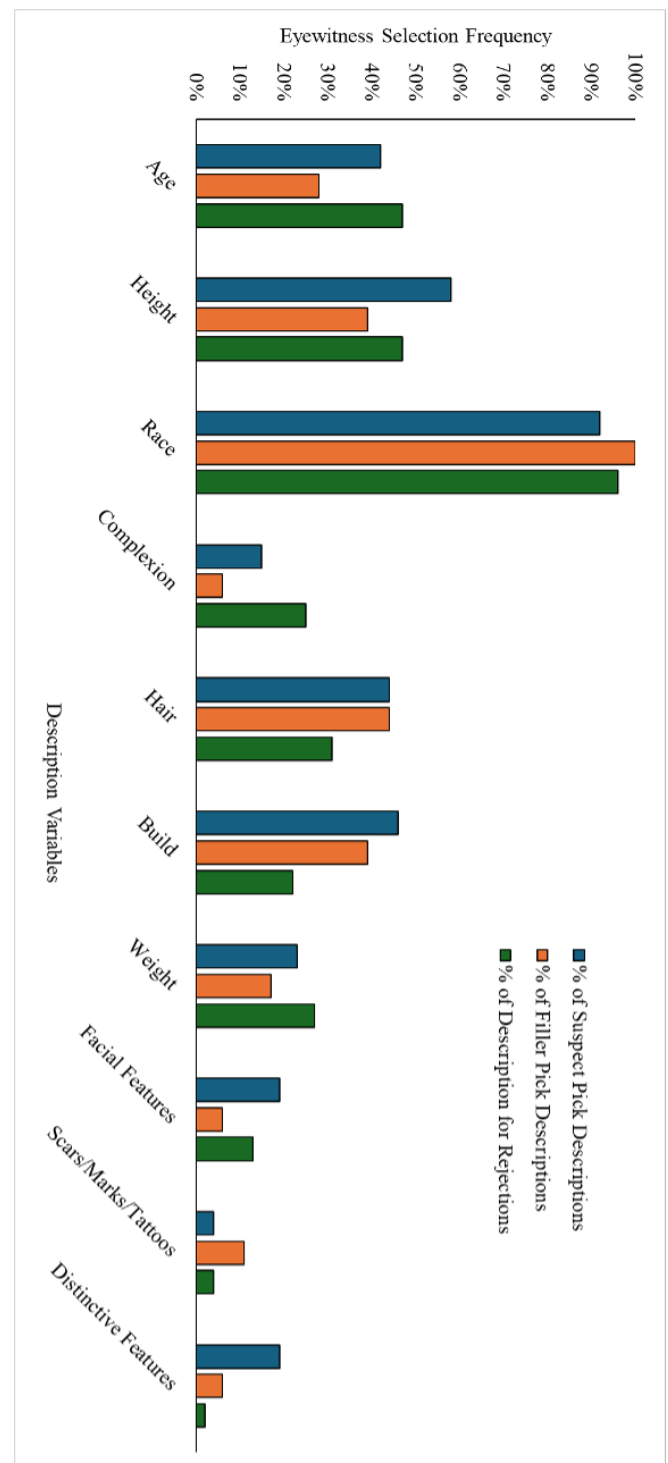
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Do Anti-bullying Programs Reduce Depression and Anxiety Experienced by Students? – A Systematic Review

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Abstract— **Bullying prevention interventions have been devised to reduce peer victimization and its negative effects on victims. Many primary research studies have examined the effectiveness of these programs, including some that investigated whether programs enhanced the self-esteem and overall mental well-being of students who participate in the programs, including those who have and have not been victimized. Several systematic reviews (analyses of secondary data) have assessed the overall effectiveness of these interventions. However, no systematic reviews analyzed the effect of anti-bullying programs on depression and anxiety among program participants. This review was the first systematic review to develop a comprehensive portrayal of the effect of bullying prevention programs on mental health, particularly depression and anxiety. This review was a meta-analysis of the effects of bullying prevention programs on the depression and anxiety of participants. Studies were selected by conducting literature searches on the following electronic databases: ERIC, PsycINFO, PsycARTICLES, Pubmed, Scopus, Web of Science, and Google Scholar. Only randomized clinical trials and pretest-posttest studies measuring the effect of these programs on the participants were included. A single effect size type, Cohen's d, was chosen, and any different effect size-types used in the studies were converted. All primary studies that met the selection criteria were coded for effect size. The weighted-mean effect size revealed a negligible effect of these programs in reducing the depression and anxiety levels of the students.**

Keywords— *Anti-bullying Programs, Bullying Prevention Programs, Depression, Anxiety*

I. Do Anti-bullying Programs Reduce Depression and Anxiety Experienced by Students? – A Systematic Review

A. Bullying and Anti-bullying Programs

Bullying became a prime area of research interest around the 1980s in Western countries due to the mass number of suicides attempted by young boys in Norway because of the increased victimization experienced by them (Olweus, 1993). Bullying is an aggressive behavior characterized by three core features: (1) an intent to harm someone; (2) repetition; and (3) a power imbalance between victim and perpetrator (Olweus, 1991). In other words, it repeatedly involves acting aggressively towards a victim who is weaker regarding their social status, physical size, or other factors. The power imbalance between a bully and a victim is a defining characteristic that allows a bully to exploit a victim (Olweus, 1991).

With rising awareness about bullying and its negative consequences, several anti-bullying interventions have been developed in schools (Smith et al., 2005). Individualized anti-bullying interventions focus on either the bully or the victim in the bullying situation. Social skills training, anger management and assertiveness training taught in these interventions are intended to help the bully manage their externalizing problems (gaining back the respect of their peers and teachers), the victim manage their internalizing problems (any psychological struggle such as feeling depressed or anxious), and both mend their relationship (Smith et al, 2003). Peer-led anti-bullying interventions involve conflict resolution or teaching peers how to help the victims in bullying situations with empathy, active listening and problem-solving (Cowie & Olafsson, 2000). These interventions aim to improve communication rather than blaming others, make students more responsible, and create roles that make peers more empathetic (Cowie & Olafsson, 2000). These interventions benefit adolescents who tend to defy authority figures and are keener on listening to younger individuals such as their peers (Salmivalli, 2001). Additionally, one of the reasons for bullying behaviors is bystanders showing a lack of support for the victims and encouraging the bully's behaviours (Saarento et al., 2015). Therefore, teaching peers to be empathetic can help alter the course of bullying.

Bullying prevention programs or anti-bullying programs are intervention programs that aim to reduce the prevalence rates of bullying and alter any attitudes or behaviours that support it (Hallford et al., 2006). Usually, these programs employ a whole-school approach and assume bullying to be a systemic problem (Richard et al., 2011). Therefore, most anti-bullying or bullying prevention programs are directed toward the whole school community (Smith et al., 2005). Some of the anti-bullying strategies that these programs use are: (a) punitive approaches, such as informing students of the consequences of any bullying behavior; (b) non-punitive approaches, such as parent training, (c) student committees; and (d) student intervention approaches which focus on peer relationships and seeking help from support groups (Moore & Woodcock, 2016).

B. Victimization and Mental Health Effects of Bullying

According to Olweus (2001), victimization takes place when a student is repeatedly exposed to the negative actions of one or more students. In victimization the focus lies on victims in the bullying situation. Frequent victimization in the long term can be deleterious to health. It is correlated with severe mental health problems such as increases in depression, anxiety, academic distress, increased risk of self-harm, and suicide (Kelly et al., 2015). Another study reported similar results where victimization was significantly

correlated with depression and anxiety, as well as with related constructs such as low self-esteem, neuroticism, emotional sensitivity, and poor social skills (Casper & Card, 2017). Studies have also revealed that victimization is not only associated with an increased risk of depression and low self-esteem (Juvonen & Graham, 2014), but also with other behavioral conditions such as conduct problems, delinquency and aggression in the future (Farrington et al., 2012).

Bullying can be associated with psychological problems for the bullies, the victims, as well as the bystanders (Ttofi et al., 2014). For example, bullies are often rejected by their peers and are at a greater risk of dropping out of school, being unemployed and engaging in substance abuse in the future (Warden & MacKinnon 2003). Children who bully others usually get bullied themselves (Smokowski & Kopasz, 2005). Victims, on the other hand, tend to suffer from several physical and mental health issues, perceive themselves to be socially isolated, and experience lesser school well-being (Bouman et al., 2012). Lastly, even the witnesses of bullying situations are at a greater risk of suffering from anxiety and depression, social adjustment problems, and feeling uncomfortable at school (Nishina & Juvonen 2005; Rivers et al., 2009; Werth et al., 2015).

C. Theoretical Background

Several theories explain why those associated with bullying might be experiencing its negative consequences. The person-group dissimilarity model suggests that group norm deviation produced by bullying leads to negative judgment by peers, ultimately leading to negative health consequences (Wright et al., 1986). Evaluation of one's behavior is dependent on the group and the norms in which they are embedded (Wright et al., 1986). Group norms direct the group and prescribe which behaviors are appropriate or inappropriate. Such norms can then be related to bullying and victimization (Huitsing et al., 2012). Focusing on victimization in bullying and intervention programs makes the victims and bullies deviate from the group. For example, the victims and the bullies face negative health consequences for being involved in bullying when no one else is (Huitsing et al., 2019). When their behaviors do not match the group norms, they are negatively evaluated and treated by others, further impacting their adjustment (Huitsing et al., 2019). Another theory, the social comparison theory, postulates that humans evaluate themselves by comparing themselves to others (Festinger, 1954). For those involved in bullying contexts (whether it be the victims, the bullies, or the bystanders), the referent group is their friends. Comparison with the better-off friends may further provoke those involved in bullying to negatively evaluate themselves. (Huitsing et al., 2019).

D. The Need to Assess Mental Health

Several school-based anti-bullying programs have been developed to combat bullying (Smith et al., 2004). However, evaluations of these programs based on several meta-analyses have repeatedly shown that they have produced only modest gains in helping combat bullying (Ttofi & Farrington, 2011). This could be because factors other than victimization may be involved, which could help reduce bullying. Bullying is believed to be more than a bully-to-victim relationship, and a variety of social contexts influence it (Saarento et al., 2015). A study conducted by Valenzuela et al. (2022) highlighted the need to evaluate the effect of anti-bullying programs on other outcomes, such as school membership and mental health, in different periods and contexts. This is evidenced by the claim that anti-bullying programs like KiVa did not affect secondary outcomes such as children's mental health or their academics (Valenzuela et al., 2022). Another study conducted by Salmivalli (2018) suggested that it is important to understand the negative consequences of victimization, especially those on victims' mental health in schools that support the reduction of victimization. Therefore, using only victimization as a criterion may not be appropriate for measuring the effectiveness of anti-bullying programs. The dearth of literature assessing mental health outcomes of anti-bullying programs suggests that there is a need to evaluate the impact of these programs on the mental health of students.

Considering that the victims, bullies, and bystanders bear the negative mental health consequences of bullying (Ttofi et al., 2014), and it is widely known that victimization is associated with outcomes such as anxiety and depression (Casper & Card, 2017; Kelly et al., 2015), it would only make sense to evaluate the effectiveness of these programs by measuring both victimization as well as associated mental health outcomes. Based on the literature reviewed, it can be concluded that little is known about the effects of these programs on the mental health of the students, which is equally important. It is not clear whether these programs are just successful in reducing victimization or whether they can reduce the mental health problems that come along with bullying. If anti-bullying programs do not serve their stated purpose of improving children's mental health, then they would be an impractical solution for combating bullying. Schools implementing and buying these anti-bullying programs will be wasting resources if these programs do not serve their purpose. Perhaps a better solution to combat bullying could be to teach students how to exercise social and emotional well-being with each other. For example, a study conducted at the Why the Cliff Education Center in Canada revealed that having a deep-rooted ethic of care in the school helped children develop positive attitudes toward the school, feel passionate about care, and improve their well-being (Mare, 2011).

Though bullying can occur in different contexts, such as in schools, in the workplace, and online, most school children often report being bullied at least ten to twenty percent of their school time (Rigby & Smith, 2011). Therefore, the present review is concerned only with bullying that occurs between four-to-eighteen-year-old school children. The present systematic review is the first to focus on the extent to which these school-based anti-bullying programs reduce the mental health problems of school students aged 4-18 years, specifically their effects on depression and anxiety.

II. Methods

A. Systematic Review

Inclusion Criteria: Before conducting a literature search strict inclusion and exclusion criteria were established to be included in the present meta-analysis. Studies that met

the following conditions were included in the present review: (1) studies evaluating only school-based anti-bullying programs/interventions conducted between ages 4 to 18 years, (2) studies measuring depression, anxiety, or both after the implementation of a bullying prevention intervention, (3) studies employing either the randomized controlled trial (RCT) or pretest-posttest method, and (4) studies which were conducted on typically developing children. There were no restrictions regarding the publication date to get as many studies as possible for the analysis. However, some additional conditions for research to be included in the analysis were (5) studies should be written in English, (6) studies should be empirical in nature and (7) studies should be published in peer-reviewed journals.

Exclusion Criteria: Studies that met the following conditions were not part of the analysis: (1) Research that employed any other method apart from RCT or the pretest-posttest method such as a meta-analysis, (2) Any research conducted evaluating the effects of any other type of bullying programs apart from school-based ones, (3) Studies involving students with developmental disabilities, (4) Unpublished thesis or dissertations and (5) Studies written in any other language other than English.

Information Sources and Search Strategy: For conducting literature searches, electronic searches were conducted using PsycINFO, PsychARTICLES, ERIC, Pubmed, Scopus, Web of Science, and Google Scholar research databases during April 2024. Specific descriptors were used to gather as many studies as possible. The present review used the following descriptors for conducting literature searches: anti-bullying programs, bullying prevention programs, anti-bullying intervention, depression, anxiety, depressive symptoms, anxiety symptoms, anxiousness, depression scale, depression inventory, and anxiety scale.

Study Selection and Data Collection Process: The present review also included a rigorous screening procedure. Studies were initially screened based on their titles and abstracts. Further detailed screening was done based on the full text review.

III. RESULTS

A. Study Selection

Based on the initial literature search on titles and abstracts, 17 studies (PsycINFO, n=1; PsychARTICLES, n=0; ERIC, n=0; Pubmed, n=7; Scopus, n= 4; Web of Science, n=0 and Google Scholar, n=5) were screened in total. Based on the full text review, four studies found on Google Scholar were eliminated because they did not measure mental health outcomes such as depression and anxiety but rather victimization after implementing anti-bullying programs. Three studies found on Scopus and one study found on Pubmed were eliminated on the grounds of not implementing an anti-bullying program, instead just focusing on the relationship between victimization and depression and anxiety. No unpublished or non-English research was found, even in the initial screening. Despite rigorous search efforts, only nine studies (PsycINFO, n=1; Pubmed, n=6; Scopus, n=1 and Google Scholar, n=1) could meet the review's eligibility criteria. Out of these nine, seven were randomized clinical trials and two were pretest-posttest

studies without a control group. Though one of these studies was qualitative in nature, it was still included in the analysis since it provided sufficient descriptive statistics data for calculating the effect sizes.

B. Study Characteristics

Specific characteristics of each study included in the analysis are mentioned in Table 1, Appendix A. In total, three studies assessed both depression and anxiety, five studies assessed only depression, and one study assessed only anxiety. Studies included in the analysis followed a set format where they conducted these programs on all students and analyzed the data based on the baseline and post-intervention measurement of victimization and other related variables such as depression and anxiety. Only one study was conducted on the perpetrators, which assessed the impact of an anti-bullying school camp on the perpetrators.

The sample (32,396 school children, sample range: 16-8732 students) was comprised of school children who were part of different anti-bullying programs/interventions. The types of bullying prevention programs included the KiVa Program, Olweus Anti-bullying Program, Bystander Bullying Prevention Program, Bullying Victim Psychoeducation Intervention, and an anti-bullying school camp for the perpetrators in one of the studies. Most studies were conducted on third to sixth grade students, except for two studies that were conducted on high school students. All studies included both males and females. However, many differences in the sizes of control and treatment groups could be observed, the specific values are mentioned in Table 1, Appendix A. The data included information from six countries: the Netherlands, Australia, Finland, Korea, the United States and Indonesia. Only two studies provided demographic data for the socioeconomic status of the student population and included schools that were part of the lower-income socioeconomic status. The rest of the studies did not mention this information.

C. Risk of Bias in Studies

Except for one, all studies employed the random stratified sampling technique, which is a probability sampling technique. Only one study employed a convenience sampling technique (Lee et al., 2021). Three studies included in the analysis had a very low sample size compared to others (Firmawati & Sudirman, 2020; Lee et al., 2021; Midgett et al., 2020). Due to these two sampling limitations, there might be some risk of bias involved in these studies.

D. Results of Individual Studies

Results of individual studies such as their characteristics and the effect sizes calculated for each of them are included in Appendix A and B.

E. Results of Syntheses

Based on the statistical data mentioned in these studies, Cohen's d was chosen as an appropriate effect size measure. For studies in which means and standard deviations were provided, Cohen's d was calculated directly. For studies that did not mention the descriptive statistics but mentioned correlations or regression coefficients or the F or T values, these values were converted to Cohen's d using the Campbell

Effect Size Calculator. Calculated effect sizes are shown in Figure 1, Appendix B. After the calculation of the effect sizes for all the studies, a weighted mean effect size was calculated separately for depression (d=0.034, p<0.05) and anxiety (d=-0.049, p<0.05). Both of these values are found to be not significant (d<0.2). According to Cohen, any effect size value smaller than 0.2 depicts an effect size value that is not significant (Sullivan & Feinn, 2012). The positive weighted mean effect size of depression indicates an overall increase in depression, whereas the negative weighted mean effect size of anxiety indicates an overall decrease in anxiety.

F. Reporting Bias and Certainty of Results

Very few studies included information on means and standard deviations for depression and anxiety (Firmawati & Sudirman, 2020; Midgett et al., 2020; Pearl & Dulaney, 2006). However, some studies provided correlations (Rapee et al., 2020), F values (Lee et al., 2021; Williford et al., 2012), or regression coefficients (Fekkes et al., 2006, Huitsing et al., 2019; Juvonen et al., 2016&). For these studies, Cohen's D had to be calculated by converting these values using the Campbell Effect Size Calculator. This made the calculation of effect sizes more complex and because of highly varied statistical techniques used in these studies, Cohen's D was chosen as the appropriate measure for calculating the effect sizes for this review. Using different formulas and converting values for finding the effect sizes might have influenced the results.

IV. DISCUSSION

This review aimed to assess the effect of anti-bullying programs in helping reduce depression and anxiety symptoms among school students. Independent effect sizes revealed that large sample size studies (N = >3500) had a small negative effect size, showing a lesser reduction in depression and anxiety (Fekkes et al., 2006; Huitsing et al., 2018; Juvonen et al., 2016; Rapee et al., 2020; Williford et al., 2012). When the experimental group's mean is smaller than the control group's mean, it produces a negative effect size, indicating a decrease in an outcome after an intervention (Caye, 2017). The small sample size studies (N = <300) showed a large positive effect size, showing an increase in depression and anxiety levels (Firmawati & Sudirman, 2020; Lee et al., 2021; Midgett et al., 2020; Pearl & Dulaney, 2006). When the experimental group's mean is greater than the control group's mean, it produces a positive effect size, indicating an increase in an outcome after an intervention (Caye, 2017). It can be supposed that if the small sample size studies increased their sample, their effect sizes would also change since they show a greater variability in their effect sizes compared to large sample size studies (Geiser, 2024). Small sample size studies include more sampling errors, wider confidence intervals, and a narrow sampling distribution (Geiser, 2024). Therefore, when the sample size is increased, the number of sampling errors is reduced, and there is a wider sampling distribution, causing the effect sizes to change (Geiser, 2024). However, what is crucial in these findings is that the effect of these programs was not significant in decreasing anxiety and depression levels. Calculated weighted mean effect sizes for depression (d=0.034, p<0.05)

and anxiety (d=-0.049, p<0.05) were found to be not significant (d<0.2). This is because an effect size smaller than 0.2 is not significant according to Cohen (Sullivan & Feinn, 2012). Unlike anxiety, the weighted mean effect size for depression was positive, which shows an increase rather than a decrease in depression.

Though the weighted mean effect size for anxiety was negative, showing a decrease in anxiety levels, the number of studies measuring anxiety was only four. Even if anxiety does decrease with these programs, the effect size value is too small to be significant. However, just based on the signs of average effect sizes measured, one can see an increase in depression and a reduction in anxiety levels among students after participating in these programs. Another limitation of this review is that the class intervals for these samples were not calculated, which would have revealed some significant details. Class intervals help estimate effect sizes more accurately and explain a deeper relationship between the variables than p values (Nakagawa & Cuthill, 2007). Research papers included in the review did not segregate the victims and the non-victims. Only a single review was conducted on the perpetrators (Lee et al., 2021).

Considering that the entire purpose of these programs is to help a variety of students, this categorization is crucial and should be the norm in all future studies. Future researchers are also recommended to use randomized clinical trials, which is considered a gold standard for measuring cause-and-effect relationships. They should also segregate the victims and the non-victims and evaluate the impact of the interventions separately for both populations. To make the sample more representative, efforts should also be made to conduct more research in the Global South countries. All psychological variables vary in different cultures, so having a sample that does not include these countries limits the generalizability of the findings and the diversity of the sample (Henrich, 2020). It can also lead to sampling bias (Henrich, 2020). To ensure that samples within studies from the Global North are representative of its population and include people from different socio-economic statuses, more studies with a more diverse sample are needed. Contrasting results between two cultures may mean further analysis is required for better conclusions. Overall, more studies are needed to evaluate whether anti-bullying programs cause a reduction in depression and anxiety levels.

Measurement of victimization can only help assess the degree to which unwarranted aggressive behaviour is shown toward the victims (Hawker & Boulton, 2000). Most programs only use a reduction in victimization as the gold standard for measuring their effectiveness (Klocek et al., 2024). However, the aim of these programs should not only be reduction or eradication of bullying but also mitigation of the adverse effects of bullying on the mental health of students. Therefore, the effectiveness of these programs should also be measured by assessing the mental health outcomes after their implementation. Both victimization and mental health are equally important and should be assessed to evaluate the overall impact of these programs.

It could be possible that even years after bullying, its effects still outlast school children. After the implementation of bullying prevention programs, those part of the bullying

incident may face subtle forms of exclusion due to negative evaluations from their peers (Huitsing et al., 2019). Since bullying and bullying prevention programs involve a multitude of factors, such as anxiety and depression (Juvonen & Graham, 2014), the effects of these programs are more complex than understood before. These effects cannot be measured only through victimization but by measuring all the other associated factors, such as personality and mental health outcomes. Perhaps a deeper focus of these programs could be to ensure that the mental health of those involved in bullying situations is on par with those who are not involved. Efforts need to be made by program developers to either make those involved in the bullying context less salient or manage the unavoidable negative mental health effects that come along with these programs.

It is also necessary to develop more adaptive and newer approaches to deal with bullying, which could include having a school culture deeply rooted in care. Studies have shown that having a school culture and a student-teacher relationship based on care and compassion helps increase social skills and reduce aggressive behaviours among students (Mayseless, 2016). Focusing on the strengths and interests of students instead of their weaknesses also helps reduce violent and aggressive behavioural problems among them (Mare, 2011). Lastly, the root cause of bullying is considered to be microaggressions, which are subtle, brief exchanges that are meant to demean someone either intentionally or unintentionally (Nadal & Griffin, 2012). Therefore, spreading more awareness about identifying and confronting microaggressions can also help combat bullying (Nadal & Griffin, 2012). To conclude, the aim of bullying prevention programs should be to reduce victimization and mental health problems associated with bullying, such as depression and anxiety, and enhance mental health benefits, such as increased self-esteem and positive peer evaluations and support. These recommendations and study might help improve the mental health and well-being of school children and help create a safer school environment that prioritizes mental health.

APPENDIX A

TABLE I.   SPECIFIC CHARACTERISTICS OF THE STUDIES INCLUDED

Study	Sample size	Gender distribution	Age range and mean Age	Scale used to measure depression	Scale used to measure anxiety
Fekkes et al., 2006	3816 (Control group=2602; Experimental group=1214)	50% females	Range=9-12; M=10.1	Short Depression Inventory for Children	N/A
Firmawati & Sudirman, 2020	16 (Control group=0; Experimental group=16)	75% females	Range=15-18; M=17	N/A	Hamilton Anxiety Rating Scale
Huitsing et al., 2019	4356 (Control group=1	51% females	Range=9-10; M=N/A	Major Depression Disorder	Social Phobia Screening

Study	Sample size	Gender distribution	Age range and mean Age	Scale used to measure depression	Scale used to measure anxiety
	402; Experimental group=2954)			Scale	Questionnaire
Juvonen et al., 2016	7010 (Control group=3,235; Experimental group=3,775)	50.6% females	Range=N/A; M=11.2	Beck Depression Inventory	N/A
Lee et al., 2021	95 perpetrators (Control group=0; Experimental group=95)	23.2% females	Range=N/A; M=15.7	Children's Depression Inventory	N/A
Midgett et al., 2020	130 (Control group=61; Experimental group=69)	57.4% females	Range=N/A; M=12.5	Depression Scale of the Behavior Assessment System for Children–Third Edition (BASC-3)	N/A
Pearl & Dulaney, 2006	270 (Control group=0; Experimental group=270)	147 females (54.4%)	Range=10-14; M=10.63	Children's Depression Inventory.	N/A
Rapee et al., 2020	8,378 (Control group=1573; Experimental group=6805)	50.6% females	Range=7–11; M = 9.5,	Short Mood and Feelings Questionnaire	Spence Children's Anxiety Scale
Williford et al, 2012	7,741 (Control group=3685; Experimental group=4056)	50.6% females	Range=N/A; M=11.2	Beck Depression Inventory	Fear of Negative Evaluation Scale, Social Avoidance and Distress Scale

APPENDIX B

Figure 1.   *Effect Sizes for Depression and Anxiety*
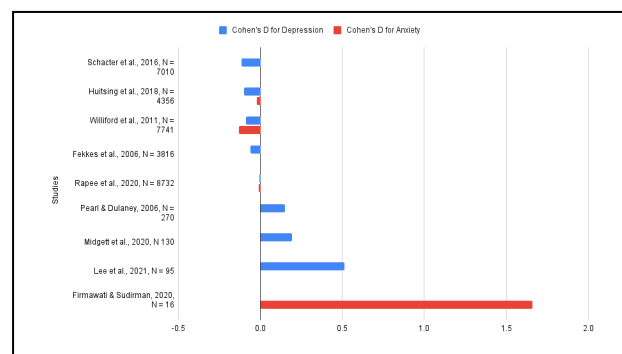
Note: The y-axis shows the studies included and the x-axis shows the effect sizes. Cohen's d was the effect size measure that was used.

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The Effects of Implementing Mindfulness Training in Professional and Retired Soccer Players

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Abstract— **Implementing mindfulness training has positive effects on both current and retired professional soccer players. Mindfulness training should be implemented into athlete training programs as it can significantly enhance players' performance, resilience, and overall well-being, making it a valuable addition to their training programs. The main arguments include an overview of mindfulness techniques such as Psychological Skills Training (PST), Mindfulness-Based Stress Reduction (MBSR), Mindfulness Acceptance and Commitment (MAC) approach, and Mindful Sport Performance Enhancing (MSPE), all tailored for sports performance. The benefits of mindfulness training include more effective decision-making, attentional focus, and emotional regulation leading to better on-field performance and off-field mental health. Additionally, there are specific challenges faced by retired players, and mindfulness practices can offer alternate coping mechanisms in addition to aiding their transition away from professional sports by addressing anxiety, depression, and stress. Despite the potential criticism regarding resource allocation and the prioritization of physical training, the short- and long-term benefits of mindfulness justify its integration into the training regimens of soccer players. Emphasis on the importance of incorporating mindfulness to enhance both the physical and mental aspects of soccer will ultimately advocate for its widespread adoption into the sport.**

Keywords— *Mindfulness, Soccer Players, PST, MAC, MBSR, MSPE, Well-Being*

I. THE EFFECTS OF IMPLEMENTING MINDFULNESS TRAINING IN PROFESSIONAL AND RETIRED SOCCER PLAYERS

Each season, one in ten players struggle with the pressure and high expectations associated with the sport (FPA, 2024). Increasingly, current and retired players are speaking out about the mental challenges they face due to the demanding nature of professional soccer (FPA, 2024). Soccer players face immense pressure on and off the field throughout their careers and after retirement. This pressure stems from the need for constant focus, high levels of attention, rapid decision-making, coping with injuries, managing failures and setbacks, and handling the demands of success (Ivarsson et al., 2015). The ability to adapt and cope with these challenges can significantly enhance a player's performance, providing a competitive edge over opponents (Memmert et al., 2023). One effective method to improve these coping and adaptation skills is through mindfulness, a practice that involves maintaining moment-to-moment awareness of one's thoughts and emotions without judgment (Moore, 2009).

Mindfulness practice typically includes techniques such as body scanning, focused attention on bodily sensations, and controlled breathing exercises, which can be either guided or solo (Fincham et al., 2023). Specific mindfulness training programs tailored for sports, such as Psychological Skills Training (PST) developed by Kerr & Gross (1996, as cited in Ivarsson et al., 2015), emphasize imagery, positive self-talk, and relaxation techniques. Similarly, Norouzi et al. (2020) explains the Mindfulness-Based Stress Reduction (MBSR) program which incorporates meditation and yoga to alleviate stress and anxiety. Gardner and Moore (2007) developed the Mindfulness, Acceptance, and Commitment (MAC) approach specifically for athletes to enhance their awareness and attention through mindfulness techniques. The Mindful Sport Performance Enhancing (MSPE) program (Pineau et al., 2014), another sports-specific method, aims to achieve a state of flow, characterized by full immersion in activity, which helps reduce anxiety and stress while improving overall well-being (Csikszentmihalyi, 1990).

To further support the effectiveness of these mindfulness techniques, psychologists can assess players using tools like the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), using a 14-item, five-point scale, that evaluates players' outlook on the future (Tennant et al., 2007), and the Mindfulness Attention Awareness Scale (MAAS), a 15-item, a six-point scale that measures present moment awareness (Brown & Ryan, 2003). Mindfulness training should be implemented in soccer training programs as it enhances athlete performance, resilience, and overall well-being, making it a valuable addition to training programs for current and retired players.

II. IMPORTANCE OF PRACTICING MINDFULNESS

Implementing mindfulness training, such as controlled breathing, is not just beneficial but essential for soccer players, both current and retired. The fast-paced nature of soccer demands quick decisions and constant adaptation, where players must stay focused and adjust effectively (Pineau et al., 2014). Through mindfulness practices like controlled breathing, athletes develop the skill to control their attention and increase their focus duration, enabling them to better adapt to various situations (Pineau et al., 2014).

The profound impact of practicing mindfulness for just ten minutes a day can significantly improve players' attentional capacity by helping them tune into their bodily sensations and breath (Fincham et al., 2023). As their attentional capacity grows, players become more aware of their surroundings, leading to quicker decisions and enhanced performance (Memmert et al., 2023). This heightened awareness and improved adaptability allow players to make

better decisions, boosting their overall performance and giving them a competitive edge (Memmert et al., 2023).

Mental flexibility is a crucial asset when facing unpredictable or adverse situations, such as conceding a goal or making an error. By training to be mentally flexible, players recover from mistakes and remain focused on the game, increasing their resilience and ability to concentrate on the next play (Pineau et al., 2014). This ability to let go of past mistakes and focus on the present is a key principle of mindfulness – being fully present in each moment, including emotions, feelings, and thoughts (Pineau et al., 2014).

For retired players, the benefits of mindfulness are equally as important. Transitioning away from the sport they love can bring about anxiety and depression (Norouzi et al., 2020). Mindfulness practices offer a lifeline, providing essential coping mechanisms and helping retired athletes find balance and fulfillment in their new lives (Norouzi et al., 2020). Engaging in mindfulness helps them confront and process suppressed emotions, leading to a healthier and more fulfilling post-sport life (Norouzi et al., 2020).

Implementing mindfulness training in soccer programs is not only about improving immediate performance but also about fostering long-term mental resilience and well-being (Pineau et al., 2014). For current players, mindfulness enhances their ability to stay focused and adapt to the fast-paced, high-pressure environment of the game, giving them a competitive edge against opponents (Memmert et al., 2023). For retired players, mindfulness offers essential coping mechanisms that help them transition smoothly into life after soccer, promoting mental health and emotional balance (Norouzi et al., 2020). These benefits underscore the necessity of incorporating mindfulness training, as it equips soccer players at every stage of their career with the tools they need to thrive, both on and off the field.

III. Mindfulness Reduces Stress in Players

Mindfulness interventions, such as Psychological Skills Training (PST), are incredibly powerful tools for reducing the immense stress soccer players face. The fast-paced, chaotic nature of soccer often leads to overwhelming stress, particularly due to the need for quick decision-making. Prolonged stress triggers the body's "Fight or Flight" response, a natural reaction allowing the body to fight or flee, which, if sustained, can result in physical effects on the body such as injuries (Williams & Andersen, 1998). However, practicing interventions such as PST, which emphasizes positive self-talk, imagery, and relaxation techniques, enables players to visualize themselves on the field, build unshakable confidence, and maintain a calm state (Ivarsson et al., 2015).

A study by Johnson et al. (2005, as cited in Ivarsson et al., 2015) revealed a significant reduction in injury frequency among players who participated in a seven-session relaxation intervention. The intervention group experienced only three injuries, versus 21 injuries in the control group, over a season (Johnson et al., 2005). By reducing stress, players think more clearly as their body and physiological systems will relax, thus preventing injuries and lowering stress and anxiety levels. Maintaining a calm state during play enables soccer players to relax their bodies and minds (Williams & Andersen, 1998).

Incorporating mindfulness into soccer training is not just a matter of enhancing physical and mental performance; it is a crucial part of protecting players' overall well-being (Ivarsson et al., 2015). The immense stress that soccer players endure on the field, driven by high standards and quick decision-making, can lead to heightened levels of anxiety and increased injury risk (Williams & Andersen, 1998). Mindfulness interventions, such as Psychological Skills Training (PST), play a pivotal role in reducing this stress, allowing players to maintain focus, relax their bodies, and prevent injuries (Williams & Andersen, 1998). By integrating mindfulness practices into training, players not only improve their ability to stay calm and composed during intense moments but also reduce the long-term physical toll of stress (Williams & Andersen, 1998). This approach—focusing on both mental and physical resilience—demonstrates why mindfulness is essential in player development.

IV. Mindfulness Improves Concentration and Emotional Response

Mindfulness training, such as Psychological Skills Training (PST) or Mindfulness-Based Stress Reduction (MBSR), profoundly increases the concentration, emotional response, and overall well-being of soccer players. By cultivating a non-judgemental state where individuals can observe their thoughts and emotions in real-time (Ivarsson et al., 2015), mindfulness allows players to process their thoughts and emotions as they occur, enabling them to maintain unwavering focus from one play to the next (Ivarsson et al., 2015).

Mindfulness training often emphasizes focusing on the breath, a practice that trains the mind to concentrate on the present task. This focus helps players develop greater control and awareness of their bodies and thoughts (Pineau et al., 2014). Enhanced concentration can lead players to achieve the flow state, where they are fully immersed and focused on their performance (Csikszentmihalyi, 1990). In this state, players experience a lack of self-consciousness, goal clarity, and complete control over their bodies and minds (Csikszentmihalyi, 1990). Achieving flow is beneficial for soccer players, as overthinking on the field can severely hinder performance (Csikszentmihalyi, 1990).

Mindfulness training plays a crucial role in enhancing both concentration and emotion regulation, making it indispensable for soccer players. The ability to focus intensely on the present moment and manage emotional responses under pressure is crucial in a sport where quick decisions and adaptability determine success (Csikszentmihalyi, 1990). By incorporating mindfulness practices such as Psychological Skills Training (PST) or Mindfulness Based Stress Reduction (MBSR), players can achieve heightened concentration, allowing them to enter a flow state where performance becomes seamless and instinctive (Csikszentmihalyi, 1990). By processing emotions in real time, athletes maintain composure and resilience, even in high-stakes situations (Ivarsson et al., 2015). This combination of focused attention and emotional control not only elevates individual performance but also fosters better communication and teamwork, ultimately strengthening the entire team's effectiveness (Ivarsson et al., 2015). Therefore,

incorporating mindfulness into training programs is essential for developing the mental sharpness and emotional stability soccer players need to excel on the field.

V. Improved Communication and Teamwork in The Third Final

The Mindfulness, Acceptance, and Commitment (MAC) approach can significantly enhance teamwork and communication, particularly in the final third of the field. The soccer field can be divided into three zones: The defensive zone, the middle zone, and the opponent's defensive zone. When a team is attacking the opponent's defensive zone, known as the final third, they are in a prime position to score. The MAC approach is highly effective for improving awareness and attention (Moore, 2009). By enhancing attentional capacities and awareness of teammates, players are more attuned to their teammates' positions, facilitating seamless coordination and decision-making (Memmert et al., 2023).

Improved attentional capacity aids in maintaining ball possession, a fundamental objective in soccer, and enhances the effectiveness of coordinating movements with teammates (Memmert et al., 2023). This not only increases scoring opportunities but also improves the team's overall control of the game (Memmert et al., 2023).

Including mindfulness in soccer training is essential because it not only enhances individual mental focus but also elevates team dynamics, particularly in high-pressure situations like the final third of the field. Approaches such as the Mindfulness, Acceptance, and Commitment (MAC) approach sharpen players' attention to awareness, allowing them to be more in sync with their teammates and make better, faster decisions in the moments that matter most (Moore, 2009). This heightened communication and teamwork in the final third leads to increased scoring opportunities and overall game control, ultimately driving team success (Memmert et al., 2023). By fostering both individual concentration and collective cohesion, mindfulness transforms the way teams operate on the field, making it a critical component of soccer training for optimal team performance.

VI. Mindfulness Benefits for Retired Players

While current soccer players reap significant benefits from mindfulness techniques like Mindfulness, Acceptance, Commitment (MAC) in improving team communication, cohesion, and performance on the field, retired soccer players can also greatly benefit from these practices. Mindfulness-Based Stress Reduction (MBSR) offers vital support to retired soccer players who often struggle with the sense of loss and identity crisis when transitioning to everyday life after their careers (Norouzi et al., 2020). For these retired athletes, MBSR provides essential tools for managing the crippling anxiety and overwhelming depression that can accompany such a significant life change (Norouzi et al., 2020).

In recent years, elite soccer clubs have embraced mental training (Dixon et al., 2020), but many retired players did not have access to these resources during their careers (Taylor, 2014). As a result, they often suppressed their emotional struggles and relied on their sport as a coping mechanism (Norouzi et al., 2020). The transition to a life without soccer can unearth these buried emotions, making the need for effective coping strategies more urgent than ever.

MBSR, which includes practices like yoga and meditation, can be a lifeline for retired athletes, helping them develop resilience against the emotional turmoil of post-career life (Norouzi et al., 2020). A study conducted by Baskin et al. (2003, as cited in Norouzi et al., 2020) illustrated the transformative power of MBSR. The study involved 20 retired professional players who participated in an eight-week MBSR program, resulting in a significant increase in psychological well-being and a marked reduction in anxiety, stress, and depression compared to a control group (Norouzi et al., 2020).

Mindfulness practices such as Mindfulness Based Stress Reduction (MBSR) and Mindfulness, Acceptance, Commitment (MAC) are not only critical for improving focus, communication, and performance of current soccer players, but they also provide support for retired players transitioning into life after the sport. The emotional challenges faced by retired athletes—such as identity loss, anxiety, and depression—show the importance of equipping them with mindfulness techniques that promote reliance and emotional well-being (Norouzi et al., 2020). While current players benefit from enhanced performance on the field, retired players can find purpose and fulfilment in managing their post-career struggles through practices such as meditation and yoga (Norouzi et al., 2020). By incorporating mindfulness into the routines of both current and retired soccer players, these practices become essential tools that support athletes, from their peak competitive years to their life beyond the game (Norouzi et al., 2020). This comprehensive approach ensures the mental and emotional well-being of players throughout their careers, reinforcing the importance of mindfulness training alongside physical preparation.

VII. Downsides of Mindfulness Training

Critics argue that soccer clubs should prioritize physical training over mindfulness training due to the significant constraints on time and resources. The substantial investments teams make in physical training facilities highlight this preference (Taylor, 2014). For example, elite soccer clubs like Manchester City invested a staggering $244.2 million, and Real Madrid spent $110.3 million, on their state-of-the-art training complexes (Ayamga, 2019). Such investments underscore the belief that physical training is paramount to achieving success on the field.

Teams allocate considerable resources to technical and conditioning coaches, ensuring that players are in peak physical condition (Taylor, 2014). Coaches and staff focus on mentally preparing players by outlining goals and expectations for games and training sessions, and they closely monitor players' physical activities. However, they may struggle to see the immediate value in supervising therapy or mental training sessions (Farias & Wikholm, 2016). The inherent resistance to new training methods is also a significant barrier. Players and coaches, accustomed to traditional physical training routines, often view these

approaches as requiring time and resources that are simply not available (Ivarsson et al., 2015).

Budget constraints further complicate the adoption of mindfulness practices. Teams often prefer to allocate their funds towards advanced equipment and facilities, believing these investments will yield more tangible results in terms of physical performance (Taylor, 2014). Building players' speed, strength, and endurance is seen as a more immediate and measurable way to enhance on-field performance (Taylor, 2014). These obstacles have led to the belief that physical training should take precedence.

While physical training provides short-term gains in speed, strength, and endurance—key elements for immediate success on the field—mindfulness offers long-term benefits that compliment physical training in performance and overall well-being (Norouzi, 2020). Physical training targets measurable attributes such as fitness levels, aiding coaches in areas of improvement (Memmert, 2023). However, physical gains may plateau over time or be hindered by injuries, stress, or burnout (Ivarsson, 2015).

In contrast, mindfulness enhances resilience, focus, and stress management, which can protect athletes from burnout and improve recovery, aiding their long-term careers (Fincham et al., 2023). For example, mindfulness improves cognitive flexibility allowing players to adapt to high pressure game situations (Sullivan, 2022). Over time, the integration of mindfulness training can increase players' stress and anxiety management, potentially reducing stress and overexertion or poor decision making (Farias & Wikholm, 2016).

While physical training yields rapid results, the psychological results gained from mindfulness offer a solution for sustained success (Taylor, 2014). This makes mindfulness a valuable complement to training, by addressing not only immediate effects of physical training but long-term mental and emotional well-being for players (Fincham et al., 2023).

However, despite the emphasis on physical training, there are practical ways to integrate mindfulness yielding long-term benefits—such as improved well-being, reduced stress, and enhanced performance—without distracting from the focus on physical conditioning (Fincham et al., 2023). For example, the United States women's soccer team has collaborated with Headspace, a mobile app that allows players to fully customize their experience and practice mindfulness from the palm of their hand (Sullivan, 2022). This flexibility enables players to integrate mindfulness exercises seamlessly into their daily routines, especially during travel or recovery periods, ensuring consistent mental training without interfering with their training schedules (Sullivan, 2022).

Applications such as Headspace are affordable, offering an individualized solution for mindfulness practice (Sullivan, 2022). Teams can also streamline integrating mindfulness practice by offering short sessions before and after physical training. The U. S. women's team relies on team psychologists to guide them through group or individual sessions focused on stress reduction and mental clarity (Sullivan, 2022). Simple exercises such as controlled breathing or guided meditation led by psychologists or mental coaches, makes it easy for players to integrate it into their schedules (Sullivan, 2022).

Although psychologists offer structured guidance, they might not always be available, especially on the road (Sullivan, 2022). In these cases, applications such as Headspace provide players with on-demand metal training resources that can be accessed anytime, whether at home, on the road, or during personal challenges (Sullivan, 2022). This autonomy allows for consistent mental training, offering the long-term benefits of mindfulness while accommodating for the unpredictable nature of soccer players' schedules (Sullivan, 2022).

VIII. COMPARATIVE BENEFITS OF MINDFULNESS FOR COACHES, CURRENT, AND RETIRED PLAYERS

Mindfulness training is not just a trendy add-on; it is a transformative tool that enhances the performance and well-being of both current and retired soccer players. For current players, mindfulness sharpens focus, improves in-game decision-making, and emotional regulation which directly impact on field success (Ivarsson et al., 2015). In a sport where split-second decisions can make the difference between victory and defeat, the heightened awareness and concentration brought by mindfulness is a crucial addition for players (Memmert et al., 2023). Another key component that has been stressed is reducing injuries, highlighting the significance of mindfulness for saving resources and promoting long-term well-being of enhanced physical performance (Ivarsson et al., 2015).

For retired players, the transition away from the sport they love can be a struggle, often leading to anxiety and depression (Norouzi et al., 2020). Mindfulness practices, such as Mindfulness-Based Stress Reduction (MBSR), provide invaluable support, offering positive coping mechanisms and helping to ease the transition into everyday life (Norouzi et al., 2020). These practices allow retired athletes to confront and process suppressed emotions, leading to a more balanced and fulfilling post-sport life (Norouzi et al., 2020). The long-term value of mindfulness stretches past the immediate performance of players, by creating life skills for players transitioning into retirement highlighting the impact of mindfulness (Norouzi et al., 2020).

The versatility of mindfulness cannot be overstated. Programs like the Mindfulness, Acceptance, and Commitment (MAC) approach (Gardner & Moore, 2007) or Mindful Sport Performance Enhancement Program (MSPE) are specifically designed to reduce stress, alleviate anxiety, and improve coping mechanisms (Pineau et al., 2014). The profound impact of just 10 minutes of daily mindfulness practice can significantly improve overall well-being and reduce stress in players (Fincham et al., 2023). Lower stress levels not only enhance performance but also reduce the risk of injuries, leading to substantial savings on rehabilitation expenses (Naderi et al., 2020).

Integrating mindfulness into a player's routines does not have to be a logistical nightmare. Sessions can be seamlessly included alongside gym workouts and on-field training, enhancing attention, concentration, and emotional regulation (Norouzi et al., 2020). While coaches and staff have busy

schedules, trained psychologists can support the mindfulness initiatives by assessing and evaluating players' progress (Musculous, 2014).

Even in financially constrained environments, the benefits of mindfulness are accessible. Coaches can undergo MSPE training themselves, eliminating the need for external professionals (Minkler et al., 2021). As players experience the positive results of these programs, their confidence and commitment to mindfulness practices will grow, continuing even beyond the structured sessions (Minkler et al., 2021). When coaches and staff witness tangible improvements in both team cohesion and individual player performance, they are more likely to embrace and advocate for these programs (Minkler et al., 2021).

Mindfulness complements traditional training by enhancing the player's awareness, concentration, coping mechanisms, and emotional responses (Ivarsson et al., 2015). The use of scales like the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant et al., 2007) and Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) allow teams to monitor progress, leading to increased well-being, emotional regulation, and enhanced performance. Ultimately, mindfulness practices offer a holistic approach that benefits players on and off the field, proving to be an indispensable part of modern soccer training (Ivarsson et al., 2015).

In the end, various forms of mindfulness practices such as Psychological Skills Training (PST; Kerr & Gross, 1996), Mindfulness-Based Stress Reduction (MBSR; Norouzi, 2020), Mindfulness, Acceptance, and Commitment approach (MAC; Moore, 2009), and Mindful Sport Performance Enhancement Program (MSPE; Pineau et al., 2014) have been explored, showing their ability to significantly enhance performance of both current and retired soccer players across multiple domains. Teams can benefit from employing psychologists to further evaluate their players using tools like the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS; Tennant, 2007) and the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003).

The benefits of mindfulness training include its ability to reduce anxiety, depression, and stress in current and retired players, and prevent injuries in players through practices such as focused breathing, meditation, and yoga. These programs can also be cost-effective alternatives to rehabilitating injured players. Moreover, mindfulness techniques can improve concentration through focused breathing and enhance a player's attentional capacity, flexibility, and adaptability, leading to quicker decision-making on and off the field.

Despite critics' skepticism, mindfulness training has the potential to enhance team performance by improving formation, tactics, cohesion, and players' ability to dominate space and time on the field. The significant benefits further stretch to retired players as they struggle with the transition away from their professional lives. By practicing forms of Mindfulness Based Stress Reduction (MBSR), players can find healthy outlets in forms of yoga and meditation to support emotional regulation. While it may seem that these techniques may not resonate with every player, teams that embrace the Mindfulness, Acceptance, Commitment (MAC)

and Mindful Sport Performance Enhancement (MSPE) approaches will see improvements in players' overall well-being, emotional responses, decreased anxiety and stress levels, and reduced injuries. Integrating these programs into current and retired soccer player's training programs and daily lives can have short-term and long-term benefits, enhancing their physical and mental health.

IX. Discussion

Further research should consider using larger sample sizes and wider age ranges to study the benefits of mindfulness training. While the field of sports psychology is growing with a high demand for psychologists, mindfulness has an abundance of research; however, it has not been applied to sports performance and integration in training (Weir, 2018). Can mindfulness be the key to unlocking consistent performance and confidence in players when integrating it with physical training? Can mental training increase players' mental strength and resilience to help teams win? Will small factors such as meditation or focused breathing make athletes and teams more successful? Future research must explore these topics to aid athletes and ensure their longevity in their sport.

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Intergenerational Emotional Flourishing: Conceptualizing the Continuity of Positive Emotion Socialization Strategies Across Generations

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Abstract— Emotion socialization (ES; i.e., strategies that minimize, dismiss, magnify, or reward emotions) is influenced by parents' own understanding and expression of emotions—factors that are shaped by their socialization history (i.e., strategies used by their parents). The present discussion first summarizes parental ES strategies and discusses how these strategies differ between the socialization of negatively valenced and positively valenced emotions. Next, we review extant research on the intergenerational continuity of parenting practices in general, which focuses on maltreatment. We expand on this literature by highlighting the importance of considering the intergenerational continuity of ES strategies for positively valenced emotions (i.e., emotions that feel good to experience; e.g., pride, joy) and identify two mechanism that may play a role in the transmission of ES strategies pertaining to positively valenced emotions across generations: (1) parental expressivity of positively valenced emotions; and (2) children's emotion schemas that are shaped by parental expressivity and, in turn, serve to inform children's use of similar ES strategies with their own children down the line. A shift in focus from negatively valenced to positively valenced emotions in the area of intergenerational continuity may support family functioning and flourishing across generations.

Keywords— *Emotion Socialization, Parenting, Positively Valenced Emotions, Parental Expressivity, Schemas, Emotional Flourishing*

I. Intergenerational Emotional Flourishing: Conceptualizing the Continuity of Positive Emotion Socialization Strategies Across Generations

Emotion socialization (ES) refers to the parental strategies and behaviours (e.g., minimizing, dismissing, magnifying) used to shape a child's experience, understanding, expression, and regulation of emotions (Friedlmeier et al., 2011). When these strategies are supportive, children are likely to develop emotional competence, which is marked by a greater capacity to understand, express, and regulate their emotions (Eisenberg, et al., 1998). Parents' reactions to their child's emotional cues and expressions, how they discuss emotions with their child, and their style of emotion expressivity are broad ES strategies that directly influence a child's emotional competence (Eisenberg et al., 1998). The ES strategies that parents use are informed by their own understandings and beliefs about emotions, which stem, in part, from the ES strategies they experienced in childhood from their parents (Hajal & Paley, 2020; Leerkes et al., 2020).

Research supporting the notion of intergenerationally influenced ES strategies has focused almost exclusively on the socialization of negatively valenced emotions, such as anger or sadness (Colombetti, 2005). However, the intergenerational influence of ES strategies for positively valenced emotions, such as pride and joy, (Colombetti, 2005) warrants investigation given that these strategies differ substantially from those used by parents in response to negatively valenced emotions (Costa Martins et al., 2018). That is, positively valenced emotions lead to the development of enduring psychosocial resources (e.g., improved problem solving, savoring positive experiences) and adaptive functioning (e.g., increased ability to manage emotions and social relationships) by momentarily broadening an individual's range of mental processes and behavioural capabilities (Fredrickson, 2001). Further, negatively valenced emotions arise in contexts where objects, events, or situations pose a challenge or threat to one's wellbeing, whereas positively valenced emotions arise in contexts where environmental contingencies support or contribute to wellbeing (Frijda, 2007). These differences suggest that the mechanisms that contribute to one's tendency to experience and promote positively versus negatively valenced emotions likely differ and warrant exploration (Costa Martins et al., 2018).

In this paper, we first outline parental ES strategies and discuss how these strategies differ between the socialization of negatively valenced and positively valenced emotions. Then, we review the existing literature on the intergenerational transmission of socialization practices, focusing on ES strategies. Finally, we identify two interrelated mechanisms through which parents may transfer emotion socialization strategies of positively valenced emotions to their children: parental positive dominant expressivity and its effects on shaping children's emotion schemas. Research on intergenerational continuity has been significant in identifying and interrupting maladaptive patterns across family generations (Waters, 2020). However, the scarcity of literature on the mechanisms that contribute to the transmission of adaptive patterns across family generations impedes the capacity to support families in initiating and retaining emotional flourishing across generations (Waters, 2020). Thus, this investigation may be valuable for initiating a shift towards developing and strengthening familial resources.

II. Emotion Socialization Strategies

ES strategies broadly include parents' reactions to children's emotional cues and expressions, their discussions about emotions with their children, and parental emotion expressivity (Eisenberg et al., 1998; Morris et al., 2007). Parental use of supportive ES strategies can support the development of emotional and social competence among their child (Eisenberg et al., 1998). Emotional and social competence refer to the capacity to understand one's own and others' emotions, and to manage and modulate emotional expressions to be situationally appropriate and meet goals in socially acceptable ways (Eisenberg et al., 1998).

ES strategies include both common and specific processes (Yeo & Cheah, 2023). Common processes pertain to a parent's meta-emotion philosophy, which encompasses parental values and beliefs about their own and their child's emotions (i.e., when it is appropriate to experience and express various emotions). A parent's meta-emotion philosophy can consciously or unconsciously guide their emotion socialization goals for their child (i.e., how emotions should be managed; Yeo & Cheah, 2023). The meta-emotion philosophy creates the emotional context through which a parent engages in more specific and direct strategies (e.g., magnifying or dismissing) to regulate their child's experience of emotions in accordance with their socialization goals (Yeo & Cheah, 2023). Specific processes are separated into parental responses to their child's expressed emotion (e.g., neglecting, rewarding, overriding, punishing, and/or magnifying the emotion) and parents' own emotional expressivities (e.g., outward or subtle display), which refer to a parent's style of displaying positively or negatively valenced emotions (Yeo & Cheah, 2023). Unsupportive ES strategies, such as neglecting, overriding, punishing and/or magnifying are thought to have intergenerational effects in the context of socializing negatively valenced emotions (Leerkes et al., 2020). Alternatively, parental positive dominant expressivity (i.e., emphatic style of displaying positive emotion) is a supportive strategy unique to the socialization of positively valenced emotions and may be particularly transmissible across generations (Eisenberg et al., 1998). Differences between the socialization of negatively and positively valenced emotions will be expanded upon below, followed by a discussion of how these emotion types may differentially contribute to child wellbeing.

A. Socialization of Negatively Valenced versus Positively Valenced Emotions

ES strategies used to socialize positively valenced emotions differ significantly from those used for negatively valenced emotions. For instance, the use of magnifying, where the child's emotional expression is matched with greater intensity by the parent, is unsupportive for negatively valenced emotions as it may lead to emotion dysregulation (Costa Martins et al., 2018). However, this strategy is considered instrumental for the socialization of positively valenced emotions whereby it may enhance the child's experience of a positively valenced emotion and lead to savouring (i.e., indulging in and extending the experience of positively valenced emotions; Shi et al., 2023). ES strategies for negatively valenced emotions are considered supportive to the extent that they manage and minimize the child's experience of them. Alternatively, strategies are considered supportive for the socialization of positively valenced emotions when they build-upon and extend their experience (Costa Martins et al., 2018).

One distinguishing feature between the socialization of positively and negatively valenced emotions is that strategies that support the cultivation of positively valenced emotions, such as expressive encouragement, provide a child with the ability to counteract negatively valenced emotions through the self-generation of positively valenced ones (Sosa-Hernandez et al., 2020). Another prominent strategy unique to the socialization of positively valenced emotions is the use of niche-picking such that parents intentionally create contexts where their child has the opportunity to experience or generate positively valenced emotions on their own (Lozada et al., 2016). Taken together, ES strategies considered supportive for the socialization of positively valenced emotions are those that actively construct them, while supportive ES strategies for negatively valenced emotions focus on regulating their experience. Based on these differences, we can expect their effects on child outcomes to differ as well.

B. The Cultivation of Positively Valenced Emotions and Child Wellbeing

There are significant positive psychosocial outcomes of supportive ES strategies for children's development of positively valenced emotions and are captured by the broaden-and-build theory (Fredrickson, 2001). This theory contends that the experience of positively valenced emotions within supportive relational contexts momentarily broadens the range of an individual's mental processes and behavioural capacities, and builds lasting physical, intellectual, and social resources (e.g., improved health, problem-solving abilities, and ability to form relationships with peers). Further, children subject to supportive ES strategies, such as magnifying emotion, may continue to self-generate positively valenced emotions by seeking and creating experiences that elicit those same positively valenced emotions that their parents encouraged (Fredrickson, 2001). Freeman and colleagues (2022) found that children whose parents actively sought to enhance and savour their positively valenced emotions were more inclined to do so independently. Parental expressive encouragement of positively valenced emotions is an example of an ES strategy that is found to lead to the broaden-and-build effect (Fredrickson, 2001). This strategy enhances children's broader subjective wellbeing by expanding various resources, such as psychological (e.g., the ability to regulate negative emotions more effectively), intellectual (e.g., creative thinking and problem-solving abilities), and social (e.g., social network expansion) These resources shape a child's emotional preferences (i.e., broadening of mental processes) and positions them towards opportunities that would enable these emotions to be experienced further (Fredrickson, 2001). The broaden-and-build effect is a unique and powerful outcome of parental use of ES strategies around positively valenced emotions. Taken together, these outcomes on child wellbeing highlight the need to investigate the features that support parents' efforts to cultivate positively valenced emotions in their children, such as intergenerational influence.

III. INTERGENERATIONAL SOCIALIZATION PRACTICES

The existing body of literature on intergenerational transmission in parenting practices has predominantly examined the continuity of adverse behaviours across generations such as maltreatment (e.g., abuse and neglect). For instance, children subject to harsh, rejective and/or hostile parenting practices such as dismissing a child's negative experiences and/or criticizing them, are more likely to adopt these same practices as parents (Conger et al., 2013; He et al., 2020; Sekaran et al., 2021; Taccini et al., 2024). Parental invalidation (i.e., consistent punishment or minimization of a child's expressed emotions or needs) has also been found to be transmissible across generations because of its ability to shape a child's attitudes about parenting (Lee et al., 2023). Similar findings have also been shown for other abusive parenting practices, such as physical and psychological violence (Rodriguez et al., 2018). For example, mothers who experienced physical and psychological abuse in childhood were more likely to engage in physical and psychological aggression with their own children. These findings support the intergenerational transmission hypothesis (ITH) which posits that violence tends to continue across parenting generations because abusive childhood experiences lead to negative attributions and unrealistic standards that may influence how a parent interprets their own child's behaviour (Rodriguez et al., 2018). Experiences of abuse can also impart attitudes around the utility of physical punishment, which may influence a parent's use of abusive practices to manage child expressions deemed inappropriate (Rodriguez et al., 2018).

Although the ITH focuses on cycles of maltreatment, researchers have more recently begun to examine the intergenerational transmission of growth-promoting and constructive parenting behaviours, though primarily within Western cultures (Belsky et al., 2009; Lee et al., 2023; Neppl et al., 2009; Yan et al., 2016). This literature focuses on the transmission of adaptive parenting practices as well as practices that sever the cycles of maltreatment captured by the ITH (Sekaran et al., 2021). For instance, children subject to parenting characterized as warm, accepting and supportive and who received healthy forms of parental discipline (e.g., clear boundary-setting, explanations for consequences) are more likely to adopt these constructive practices when they become parents (Belsky et al., 2009; Belsky et al., 2005). Belsky and colleagues (2005) explain this trend by suggesting that proximal life experiences (i.e., experiences that directly impact development) when a child is developing are predictive of their functioning in adulthood, including the parenting practices they adopt. For instance, a positive family climate (i.e., high levels of communication and expressivity) is regarded as a proximal experience that contributes to the intergenerational transmission of constructive parenting practices (Belsky et al., 2005).

Together, these bodies of work have supported the idea of ITH, that parents replicate the forms of parenting they experienced themselves as children (Yan et al., 2016). However, there is less research investigating the use of specific strategies as they pertain to the socialization of negatively valenced emotions and—especially—positively valenced emotions across generations.

IV. INTERGENERATIONAL EMOTION SOCIALIZATION STRATEGIES

There is an urgent need to understand intergenerational emotion socialization given that ES strategies are key determinants of social and emotional competence amongst children and youth (Eisenberg et al.,1998). Leerkes and colleagues (2020) found that parents who experienced unsupportive ES (e.g., dismissing) in response to negative emotions from their own parents growing up were more likely to use those same strategies with their own children decades later. Their findings support the broader significance of parental ES strategies identified in Eisenberg et al.'s (1998) model of emotion socialization, in which parenting practices in the subsequent generation represent a tenable outcome of ES strategies experienced in childhood. Leerkes and colleagues (2020) propose affect-event links as a potential mechanism driving this continuity. Affect-event links refer to the cognitive-affective process whereby the ES strategies parents experienced in childhood formed schemas (i.e., stable interpretations and manners of responding to emotional content). These schemas guide a parent's socialization efforts with their own children by consciously or unconsciously drawing on the parenting practices they experienced in their own childhood as templates for how to handle parenting challenges (Leerkes et al., 2020). Leerkes and colleagues (2020) focus exclusively on ES strategies of negatively valenced emotions.

Emotion regulation (ER) is one prominent outcome of effective use of ES strategies and is identified as a transmissible feature of parenting practices (Bridgett et al., 2015; Morris et al., 2007). Observational learning around managing emotional experience, the parenting practices aimed specifically at socializing ER abilities, and the emotional climate of the family may work in conjunction to replicate ER status across generations (Bridgett et al., 2015; Morris et al., 2007). Since the use of ES for the socialization of positively valenced emotions (e.g., magnifying and positive encouragement) have been noted for their ability to facilitate enhanced ER abilities among children, an exploration of the intergenerational transmission of these specific strategies and how they may undergird improved emotional functioning across generations is a rich area for future research.

V. MECHANISMS UNDERLYING INTERGENERATIONAL ES STRATEGIES FOR POSITIVELY VALENCED EMOTIONS

We propose two interconnected pathways for the transmission of specific ES strategies used by parents when socializing *positively valenced* emotions across generations: parental positive dominant expressivity, which specifically influences the socialization of positively valenced emotions, and emotion schemas, which are the cognitive-affective structures that are shaped by parental expressivity of emotion.

A. Parental Positive Dominant Expressivity

Parental emotional expressivity has been identified as an ES socialization strategy that is thought to be transmissible across parenting generations particularly for positive emotions (Eisenberg et al., 1998). Parental emotion expressivity refers to a parent's consistent style of displaying their emotion in the family context (Ding et al., 2023). Children reference the

expressive style of their parents to understand the display rules of emotions—that is, which emotions are appropriate to express and when—and to interpret the emotional expression of others and respond to them (Ding et al., 2023). The four identified parental emotional expressivities include positive dominant expressivity (i.e., emphatic display of positive emotion), positive submissive expressivity (i.e., subtle display of positive emotion), negative dominant expressivity (i.e., emphatic display of negative emotion), and negative submissive expressivity (i.e., subtle display of negative emotion; Yeo & Cheah, 2023). Positive dominant expressivity involves parents' emphatic display of positive emotions and is highlighted as the style of parental expressivity found to be cyclical between parent and child (Ding et al., 2023).

Eisenberg and colleagues (1998) draw particular significance to parental emotional expressivity for its role in predicting a child's later engagement with emotion in their model of emotion socialization. They suggest the role of parental emotional expressivity in shaping the basis of a child's self and world schemas as a key mechanism through which the child may adopt a similar style of emotion expressivity as a parent (Eisenberg et al., 1998). A parent high in positive dominant expressivity shows high levels of preoccupation with their own and their child's emotions, they display less emotion dismissiveness and are more likely to be responsive and accepting of emotions and encourage their child's expression particularly for positive emotions (see Figure 1; Eisenberg et al., 1998).

Parental expressivity shapes a child's expectations, evaluations and beliefs about emotional experiences and expressions by making attributions about their value as a means of communication (Eisenberg et al., 1998; Dunsmore & Halberstadt, 1997). The types of emotions and the degree to which parents express them are shown to determine the extent to which they are valued and expressed by their children (e.g., the overt parental expression of pride communicates to a child that pride is a valuable emotion to express; Dunsmore & Halberstadt, 1997). A child may internalize and mirror the expressivity displayed by their parent by using it to guide their own emotional expressions and to inform how they respond to the emotional expressions of others (Eisenberg et al., 1998).

Among Western cultures, parental expressivity may hold particular significance in socializing positively valenced emotions because these emotions are highly valued. For instance, children's own positive dominant expressivity is found to be linked to their mother's positive dominant expressivity (Eisenberg et al., 1998). This impact is shown to be stable throughout development, in which college students' expressivity for positive emotions was associated with high degrees of parental expressivity for positive emotions experienced during childhood (Eisenberg et al., 1998). These findings suggest that parental positive dominant expressivity may function as the template through which a child develops stable and enduring standards that influence the evaluation, management and response to positive emotions even beyond the family environment from which they emerged. These points highlight the enduring and cyclical nature of parental expressivity with regards to an individual's experience and expression of positive emotions.

B. Emotion Schemas

Emotion schemas may be one channel through which parental positive dominant expressivity is transmitted across parenting generations. In Eisenberg and colleagues' (1998) model of emotion socialization, researchers suggest that specific parenting practices, particularly parental positive dominant expressivity, in the subsequent generation represent a direct outcome of the ES strategies experienced in childhood because of their role in the formation of schemas. Schemas refer to an individual's stable representations of the world and the self as an actor in the world (Eisenberg et al., 1998)). They maintain stability by filtering out irrelevant information to consolidate only the information that is believed to be relevant to the self (Fraley et al.,1997).

As discussed above, Leerkes et al. (2020) proposed that parental ES strategies may be transmitted across generations via emotion schemas (i.e., affect-event links as termed by the researchers). They posited that childhood ES experiences craft emotion schemas, which influence how socioemotional content is understood and processed over time (Leerkes et al., 2020). Although Leerkes and colleagues (2020) discussed emotion schemas in the context intergenerational ES for negatively valenced emotions, similar processes may be at play during the intergenerational transmission of positively valenced emotions. For instance, a parent who encourages the experience and expression of positively valenced emotions may unconsciously prompt their child to associate the encouragement of positively valenced emotions with the child-rearing context. This association would then become activated when the child becomes a parent and is raising their own children. Thus, it is through parental ES efforts (e.g., positive dominant emotion expressivity) that the emotions that are experienced across contexts form a structure, such as emotion schemas (Izard, 2007). This structure becomes an enduring aspect of the self and one's response style that influences emotional functioning throughout one's own development and the development of one's children across generations (Izard, 2007).

If children's emotional schemas are shaped by parental strategies encouraging the expression of positive emotions, positive emotion expressivity may become an important and stable feature by which children define themselves and a critical determinant for how they respond to positive emotions (see Figure 1). A parent's overt display of positive emotion (i.e., positive dominant expressivity) communicates to their child their attitude specifically towards positively valenced emotions and indicates their social value (Izard, 2007). Thus, if a parent appraises their own experience of pride as valuable, the ES strategies they adopt will reflect an effort to impart these same values around pride and nurture their expression within their child. In explicitly communicating the value of positively valenced emotions, their child may develop their own attitudes about positively valenced emotions that mirror those represented by their parent's socialization practices (Izard, 2007). In this case, the consistent parental use of positive dominant expressivity may function as a vector of values and beliefs around positively valenced emotions that could contribute to the development of a child's enduring emotion schemas cognitive-affective structures (Izard, 2007). The schematic recognition of positive dominant expressivity as a valuable response to the experience of positively valenced

emotions would guide how a child communicates and responds to them beyond early developmental contexts and into adulthood where they become parents themselves (Dunsmore & Halberstadt, 1997; Izard, 2007). Thus, the use of parental positive dominant expressivity may be a key ES strategy for positively valenced emotions that is transmitted across generations through its role in shaping a child's emotion schema.

VI. Discussion

This paper aimed to shed light on the importance of understanding the ES strategies of positively valenced emotions that get passed down across parenting generations. First, we outlined parental ES strategies and their role in developing social and emotional competence in children, and discussed how these strategies differ between the socialization of negatively and positively valenced emotions (Eisenberg et al., 1998). We discussed theory and research showing that socialization goals for negatively valenced emotions represent efforts to minimize and manage their appearance, while those for positively valenced emotions represent efforts to enhance and build-upon their experience (Costa Martins et al., 2018). We also discussed how the socialization of positively valenced emotions can enhance child wellbeing by increasing coping capacity and building enduring social and psychological resources, and is thus critical to explore from an intergenerational lens. We then summarized the extant research on the intergenerational transmission and continuity of parenting practices and explore how specific ES strategies might be cyclical across generations. We introduced the ITH which has utility for explaining the continuity of abusive parenting practices, but has not been applied to more constructive parenting practices (Rodriguez et al., 2018). We argued that employing this hypothesis when considering the continuity of ES strategies for positively valenced emotions may inform our ability to promote emotional flourishing across generations (Waters, 2020). Finally, we highlighted two distinct but interconnected intergenerational channels through which positively valenced emotions may be passed down across generations: parental positive dominant expressivity and emotion schema. The use of parental positive dominant expressivity may be transmitted across generations by shaping a child's emotion schema—that is, their enduring beliefs and attitudes—around the value of expressing positively valenced emotions and encouraging their expression in others.

Given the plethora of modern intervention efforts focused on severing maladaptive emotion patterns across generations (Choi, 2023), our focus on identifying the intergenerational influence of parental ES strategies for positively valenced emotions is critical for complementing current efforts and could contribute to the development of programs focused on supporting the acquisition of adaptive emotion patterns across generations (Leerkes et al., 2020). Our efforts seek to initiate a shift away from crisis management to instead focus on enhancing long-term positive outcomes among families (Waters, 2020). Positive psychology interventions could contribute to the development of parenting skills and resources, such as supporting the development of positive dominant expressivity, by targeting parental attitudes and beliefs around positively valenced emotions which could lead to stable positive emotional functioning across parenting

generations (Waters, 2020). This discussion aimed to make the idea of emotional flourishing relevant in the existing body of literature on the intergenerational features of parenting practices by proposing a pathway for the transmission of ES strategies for positively valenced emotions across generations. The potential for further research to support emotional flourishing and family wellbeing across generations necessitates continued exploration.

We acknowledge the limitations of our discussion to direct future exploration in this area. Firstly, our investigation is conceptual in nature and that the relationship between emotion schemas and the continuity of ES strategies for positively valenced emotions remains relatively unexplored empirically. Further, the practices that parents adopt, including the ES strategies they use, occur within a sociocultural context (Eisenberg et al., 1998). The present proposal would be strengthened by considering the extent to which shifts in cultural contexts across parenting generations may influence or impede the transmission of positive dominant expressivity and how culture may shape the socialization processes identified in developing an individual's emotion schema (Eisenberg et al., 1998). Additionally, the extent to which the pathway we propose applies to the ES of discrete positive emotions (e.g., pride versus joy versus appreciation) is worth exploring to better understand the specificities and generalisabilities of intergenerational ES strategies. It is also important to highlight that ER, which is a viable outcome of parental use of ES strategies, may also be a mechanism that supports the continuity of specific ES strategies across generations (Eisenberg et al., 1998; Morris et al., 2007). A child's improved capacity for ER is thought to be an outcome of parental positive dominant expressivity. This suggests that ER, in addition to emotion schemas, could be a relevant transmissible feature from parent to child involved in the pathway we have proposed (Tan et al., 2019). Further exploration of the pathways that lead to the transmission of ES strategies for positively valenced emotions across generations is warranted.

APPENDIX

Figure 1. *Conceptual Pathway of the Intergenerational Transmission of Socialization Strategies for Positively Valenced (PV) Emotions*
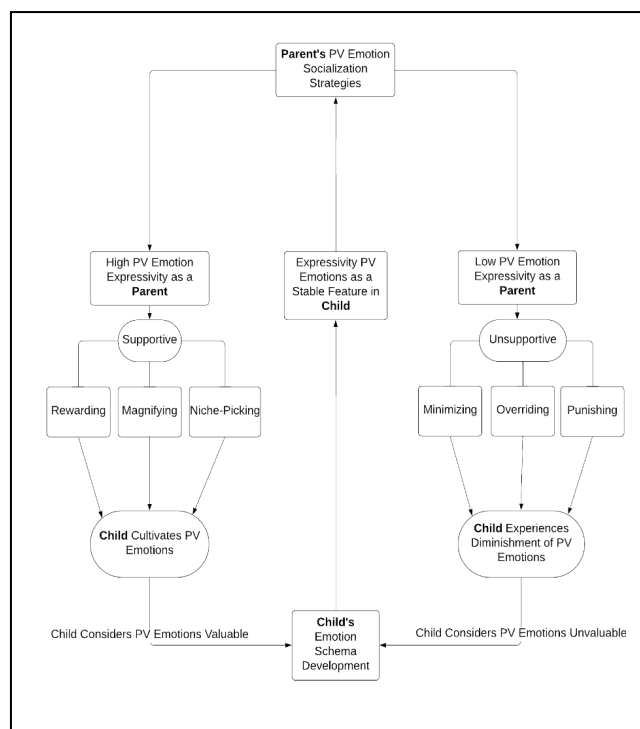
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The Development, Socialization, and Cultural Variations of Moral Pride in Children

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Abstract—**Moral pride is a positively valenced self-conscious emotion critical for virtue development. Moral pride has been of interests to philosophers for centuries due to its potential for sustaining moral behaviour. However, empirical developmental research in young children is in its infancy. This literature review begins by defining various types of pride in the psychological literature, then discusses the role of moral pride in promoting character development. We summarize recent research on the development of moral pride from toddlerhood to early adolescence and highlight early expressions (i.e., general non-moral pride and happiness in prosocial contexts) of moral pride. From this work, we propose a developmental model based on existing research to highlight key shifts in moral pride across the toddlerhood to early adolescent years. Additionally, we review research on socialization mechanisms, like praise and parent-child conversations, that may be crucial for fostering moral pride in children. Throughout the review, we discuss the cultural influences of moral pride development, illustrating how socio-cultural contexts shape children's emotional experiences. We conclude by outlining potential directions for future research in this area. Ultimately, moral pride may be a critical cornerstone of children's prosocial development, with significant implications for the well-being of children and their communities.**

I. THE DEVELOPMENT, SOCIALIZATION, AND CULTURAL VARIATIONS OF MORAL PRIDE IN CHILDREN

Moral pride—a positively valenced self-conscious emotion experienced following moral action (Tangney et al., 2007; Tracy, 2007)—plays a crucial role in shaping moral identity and virtue development, informing one's moral compass and character development (Hart & Matsuba, 2007; Krettenauer & Casey, 2015; Kristjánsson, 2001; Tangney et al., 2007; Tracy & Robins, 2007a). To date, researchers have focused on examining children's experience of non-moral pride and children's general tendency to feel happiness following prosocial behaviour (i.e., voluntary behaviour aimed at benefitting another such as helping, sharing, or comforting; Eisenberg, 2014). Nevertheless, these lines of research may help to inform the trajectory of children's moral pride development. While much research exists on socialization strategies that promote children's negatively valenced moral emotions, such as empathy or guilt (Tangney et al., 2007), less is known about how parents may socialize their children's moral pride.

We begin this review by defining moral pride within early philosophical writings and more recent psychological research. Then, we discuss the development of moral pride across toddlerhood to early adolescence, and how expressions of moral pride may shift across development. To illustrate key developmental milestones of moral pride, we propose a model that offers insight into how children's moral pride experiences change from toddlerhood to adolescence. Next, we discuss socialization mechanisms that may promote moral pride development in children. We discuss cultural variations in moral pride across development throughout our paper to underscore the role of sociocultural contexts in its development. Ultimately, we strive to bring attention to this overlooked emotion and its potential to foster children's capacity for kindness.

II. DEFINITIONS OF PRIDE AND ITS DIMENSIONS

Pride is a positively valenced self-conscious emotion characterized by pleasure or satisfaction derived from accomplishing an action (Tracy & Robins, 2004, 2007a). Across cultures, pride is identified through nonverbal cues such as "smiling, head tilting, expanding the posture, and raising arms above the head" (Shi et al., 2015; Tracy et al., 2005; Tracy & Robins, 2007a). Pride typically arises from appraisals that signal responsibility for a valued outcome or personhood, and it can be experienced when one meets social norms and expectations (Mascolo & Fischer, 1995; Tangney et al., 2007). Furthermore, feeling pride can boost self-worth and satisfaction, and it encourages individuals to continue engaging in the positive and moral actions that initially evoked it (Tangney et al., 2007; Tracy, 2007).

Pride may manifest in two forms: authentic pride, which stems from prosocial or achievement-oriented accomplishments and is directed at the action itself (e.g., "I am proud of myself for *what I accomplished.*"), and hubristic pride, which is based on an inflated sense of self-importance focusing on one's perceived exceptional qualities (e.g., "I am proud of myself because *I am excellent.*"; Tracy et al., 2023). Authentic pride may be further distinguished by the type of action that it follows; specifically, non-moral pride. This type of pride stems from personal accomplishments such as academic, athletic, or other personally relevant achievements that benefit the self (Tracy & Robins, 2004). In contrast, moral pride reflects achievements that involve acts of justice, fairness, and/or care—acts that benefit others (Tracy & Robins, 2007b). As such, pride in the moral domain is considered a moral emotion because it is other-focused and it is experienced when one's actions align with their moral values (Tangney et al., 2007). The various forms of pride are illustrated in Appendix A.

While research largely focuses on the distinction and benefits of experiencing authentic over hubristic pride, there is a notable gap in empirical studies concerning the development of moral pride, a subtype of authentic pride. The next section will explore philosophical theories about the role of moral pride in developing a moral character, and we will review psychological research that supports these theories.

A. Philosophical Groundings of Moral Pride

Moral pride, a positive feeling or happiness following moral action (Conejero et al., 2021; Peplak et al., 2023), fosters ongoing commitment to moral behaviour through an emotion-centered framework (Hart & Matsuba, 2007). This framework is reinforced by social feedback that validates or challenges one's actions (Hart & Matsuba, 2007; Tracy, 2007). For example, Hume (1739/2007) argued that pleasurable or painful experiences in social contexts shape moral judgment and behaviour by signalling whether one's actions are good (i.e., resulting in positive outcomes for the self and others) or bad (i.e., resulting in negative outcomes for the self and others). He argued that, while feeling pride after moral behaviour is virtuous, excessive pride can be harmful if it oversteps social norms (Kristjánsson, 2001). For example, celebrating personal achievements is admirable, but flaunting them with arrogance can alienate others and foster resentment. This concept extends Aristotle's (322 BCE/2014; Niemiec 2019) theorizing of the "golden mean", which posits that virtue lies at the balance between deficiency and excess.

Kristjánsson (2001) expanded on how experiences of moral pride reflect an awareness of one's achievements and moral behaviour, enhancing self-confidence and self-awareness. Ideally, a balanced experience of pride empowers individuals to pursue their goals with certainty and determination (Kristjánsson, 2001). Hume (1739/2007) and Kristjánsson (2001) agree that pride and self-reflection are vital to the human experience. They note that personal experiences—such as social feedback, achievements, and moral challenges—shape self-representations and enhance moral pride, which in turn fosters a strong commitment to moral integrity and leading a moral life (Hume, 1739/2007; Tracy, 2007; Tracy et al., 2005; Tracy & Robins, 2004). Furthermore, Aknin and colleagues (2018) propose that positive emotions, which are noted to be intrinsically rewarding, create a feedback loop following prosocial actions. The enjoyment derived from these moral actions reinforces and motivates continued engagement in such behaviours.

While the significance of moral pride has been discussed for centuries, empirical research on its development in children is limited. We will explore two key research areas—non-moral pride and children's happiness following prosocial behaviour—and how they may contribute to our understand of moral pride development in children and adolescents.

III. MORAL PRIDE AND ITS DEVELOPMENT

In this section, we will first discuss research on children's non-moral pride early in development. We then summarize research on children's happiness following prosocial behaviour and how it may be an early indicator of children's developing moral pride. Lastly, we will review the nascent literature on moral pride, which has primarily been examined in adolescents.

A. The Development of Non-Moral Pride

Self-conscious emotions, such as pride, tend to emerge later in the second to third years of life as children advance in their socio-cognitive abilities (Hart & Matsuba, 2007; Tracy, 2007). Children concurrently begin to learn about the norms and values of their cultural context, which help them understand which behaviours are "good" and expected, and which are not (Rogoff, 2014). By age three, children begin to display nonverbal signs of pride, such as smiling or elevating their posture, after successfully completing challenging tasks like stacking shapes on pegs (Belsky et al., 1997). This indicates that toddlerhood may be a key period for the emergence of pride, as abilities such as self-reflection and value recognition develop (Belsky et al., 1997; Lewis et al., 1992). Additionally, children as young as four years-old recognize and identify nonverbal expressions of pride (Garcia et al., 2015; Tracy et al., 2005). By ages five to six, children show greater consistency, than three- to four-year-olds, in selecting photos that depict pride as the emotion they felt after completing a challenging task—demonstrating early abilities to recognize and identify non-moral pride (Garcia et al., 2015). Insights from this literature on the development of non-moral pride, a type of authentic pride, may illuminate the early emergence of moral pride by highlighting children's nonverbal expressions, their recognition of these expressions, and their motivation to engage in achievement-related tasks.

B. Happiness Following Prosocial Behaviour

Behavioural Expressions Following Prosocial Behaviour: At two years old, children show signs of postural elevation when helping or observing another person receiving help (Hepach et al., 2023). Additionally, Ross (2017) found that three- to four-year olds expressed positive emotions—whether through posture, facial expressions, verbal cues, or social engagement such as moving towards the experimenter—after they spontaneously helped others. However, reparation, which is another type of prosocial action that involves an individual apologizing or trying to amend a relationship, was more strongly associated to feelings of guilt (Ross, 2017). This suggests that while early positive expressions after prosocial actions are present early in development, they may be uniquely linked to certain types of prosocial actions. In older children, such as five-year-olds, postural elevation is noticeable following their engagement in costly helping behaviours, likely driven by an appetite for others to recognize their noble deeds (Hepach et al., 2023; Sivertsen et al., 2024).

The Warm Glow Following Prosocial Behaviour: Children's "warm glow" following moral actions reveals more than just happiness; it provides insight into the early stages of moral pride development. Research shows that children under two-years-old exhibit greater happiness after sharing treats with a puppet (i.e., engaging in a costly prosocial act), compared to receiving a treat for themselves (Aknin et al., 2012), which may signal children's differentiation between moral pride and feelings of gratitude. This pattern is consistent across cultures, with children between the ages of two to five showing greater happiness following a costly prosocial action in Vanuatu, the

Netherlands, and China (Aknin et al., 2012, 2015; Song et al., 2020). Interestingly, Wu and colleagues (2017) observed that, while children aged three to five shared more stickers when directed to do so, they showed significantly greater happiness when they chose to share voluntarily—especially for five-year-olds. This highlights that children not only engage in prosocial behaviour when instructed to, but also experience a higher sense of satisfaction and happiness when they have the freedom to make the decision themselves. Although children's sharing is often shaped by conventional norms (Chai et al., 2024), promoting children's autonomy in prosocial contexts may be crucial for fostering moral pride.

In line with the influence of conventional norms, cultural norms also play a role in shaping moral pride development. Interestingly noted by Song et al. (2020), Dutch preschoolers tended to exhibit less happiness after engaging in costly sharing (i.e., sharing that involved self-sacrifice) compared to non-costly sharing (i.e., sharing without personal sacrifice such as communal resources). In contrast, Chinese preschoolers tended to exhibit greater happiness in the context of costly sharing than non-costly sharing. The authors suggested that this discrepancy may have arisen due to the experimenter's demeanor, with the Chinese experimenter, on average, displaying slightly more happiness than the Dutch experimenter across both sharing conditions. After controlling for the experimenter's presence, the happiness levels of Chinese preschoolers compared to those of Dutch preschoolers across both conditions were no longer considered significant, suggesting that the presence of others (i.e., the experimenter) may influence the expression of moral pride to those from a more collectivist culture. Indeed, as Nisbett and colleagues (2001) noted, individuals from more collectivistic cultures take a holistic approach when interpreting the emotions of others within a group context, such that the emotions of everyone in the group are considered when judging how a focal individual feels. Moreover, Fast and colleagues (2023) showed that children tend to experience happiness following prosocial behaviour when they see the positive reaction of the recipient. Perhaps observing the emotional impact of their prosocial actions on others is another key ingredient in cultivating feelings of moral pride. These findings highlight the role that cultural context plays in shaping how children feel following prosocial actions. Social and cultural influences shape children's emotional expressions, whereby relationships, group harmony, and emotional attunement may have prominent influence on children's emotions within more collectivistic cultures (Song et al., 2020).

C. The Development of Moral Pride form Early Childhood to Early Adolescence

Studies show that eight-year-olds report higher levels of moral pride than four-year-olds when imagining sharing with a peer (Malti et al., 2017; Ongley & Malti, 2014). This increase in moral pride is likely due to the emergence of children's moral self; when the values and beliefs become aligned with one's identity, guiding their actions based on their understanding of right and wrong (Krettenauer & Casey, 2015; Malti et al., 2017). This argument is supported in Peplak and colleagues (2023) cross-cultural study examining moral pride development amongst Japanese, Canadian, and Italian children, and its role as a motivator for children's

prosocial behaviour. In this study, researchers assessed both children's emotions and their moral reasoning, specifically, the reasons behind their reported feelings. This dual focus is crucial for understanding moral pride as children might feel pride for different reasons: social conventions (e.g., "I feel good for helping because it's a rule in school."), personal enjoyment (e.g., "I feel happy for helping because it's fun."), and moral values (e.g., "I feel good for helping because I care about them."). When children's positive emotions after prosocial actions stem from moral reasons, such as values of fairness and care, researchers can more confidently attribute these feelings to genuine moral pride rather than other types of pride. When examining the development of children's moral pride, Peplak and colleagues (2023) found that children's self-reported moral pride increased between the ages of six and 12 years, especially from ages six to nine. There was no difference in moral pride from ages nine to 12, denoting potential stability in moral pride development across these age groups. Interestingly, Japanese children reported lower levels of moral pride overall, compared to Canadian and Italian children (Peplak et al., 2023), possibly due to cultural differences in emotional expression.

In Western cultures, individuals often celebrate their pride, while Eastern cultures tend to emphasize social harmony, humility, and collective well-being (Furukawa et al., 2012; Peplak et al., 2023). For example, in East Asian cultures, expressing pride can be perceived as disruptive to group cohesion, as it may overshadow the contributions of others and create social imbalances. As a result, pride is often downplayed or discouraged in favour of maintaining modesty and preserving relationships within the community. Similar findings have shown that children ages eight to nine from certain Western cultures (e.g., USA) exhibited higher levels of authentic and hubristic pride than those from Eastern cultures (e.g., Japan and Korea; Furukawa et al., 2012). Although research specifically examining the development of moral pride is limited, these studies suggest that moral pride generally increases with age and its expression can vary across different cultural contexts.

For adolescents, researchers have shown that nine- to eleven-year-olds who feel proud following a prosocial act are more inclined to continue engaging in such behaviour (Etxebarria et al., 2015). However, recalling past experiences of moral pride might be less effective at encouraging prosocial behaviour, than recalling more mundane situations when pride was experienced (Etxebarria et al., 2015). Perhaps moral pride, particularly during childhood and adolescence, relies on external validation—like an audience or social rewards (e.g., praise)—to reinforce continued moral actions and develop moral agency (Grusec, 2023). This reliance on external feedback may suggest why adolescents struggle to feel high levels of moral pride when their actions lack immediate social recognition or reward. For instance, adolescents often experience less moral pride when their prosocial actions conflict with the majority or come at a significant personal cost (Etxebarria et al., 2014; Tracy, 2007). The presence of others and adherence to group norms can significantly affect how and when children experience moral pride, which in turn may shape the development of their moral identity during adolescence.

Moral identity integrates beliefs about morality into one's self-concept (Hardy & Carlo, 2011). A strong moral identity encompasses a deep belief in the importance of values—such as honesty, compassion, and fairness (Krettenauer & Casey, 2015). As such, adolescents with a strong moral identity are more likely to engage in prosocial behaviours, driven by their moral compass that steers them to align their actions with social norms and ethical standards (Krettenauer & Casey, 2015). This understanding of moral identity's role in encouraging prosocial behaviour highlights the crucial influence of moral emotions, specifically moral pride, and the presence of others in creating a socially supportive environment that fosters continuous prosocial actions. Taken together, the development of moral pride is a complex process that involves the development of self-reflection and moral values, which is largely influenced by cultural norms.

D. Model of Moral Pride Development

Based on the literature reviewed on children's moral pride above, we propose a model of moral pride development from toddlerhood through early adolescence (see Appendix B). Within this model, we summarize key milestones that likely contribute to moral pride development across four distinct developmental periods, highlighting specific patterns and trends that we have observed within the literature thus far. This model may serve as a foundation for understanding the development of children's moral pride and how this role shapes moral identity in adolescence and adulthood, particularly within cultural contexts.

IV. SOCIALIZATION OF MORAL PRIDE

Currently, there is no research to our knowledge that examines how children learn to feel and express moral pride. In this section, we will discuss two key socialization strategies at the family-level that may influence the development of moral pride in children and adolescents: parental praise and parent-child conversations. While both are significant in fostering moral pride, we will also explore how some forms of praise, despite their benefits, may demotivate children and hinder the development of moral pride.

A. Parental Praise

The early emergence of moral pride may partly result from parents' use of praise. For instance, parents may praise their child after an achievement by saying, "you did such a great job" (Thompson, 2022). They may highlight the outcome of the child's action and also emphasize their efforts, strategies, and steps taken to achieve the outcome (i.e., process praise; Xu et al., 2024). Research by Gunderson and colleagues (2013) illustrates that using process praise with toddlers increases the likelihood that they will develop a growth mindset by ages seven to eight. This mindset is crucial for healthy child development because it fosters the belief that abilities can be developed—rather than inborn—through continuous effort, ultimately encouraging children to embrace challenges and persevere (Dweck, 2017). Furthermore, praising adolescents for their prosocial behaviours (i.e., using process praise for moral actions) is shown to predict greater resilience against depressive symptoms two years later (Nagaoka et al., 2022).

This effect likely arises because process praise helps adolescents link their actions to their moral self. By recognising and valuing their prosocial behaviours, this type of praise strengthens their sense of achievement and moral integrity. As a result, it promotes self-acceptance and boosts self-esteem, which can contribute to better mental health and emotional strength (Brummelman et al., 2016; Nagaoka et al., 2022).

B. Precautions to Using Praise

While praise is crucial for fostering moral pride in children and adolescents, it can have drawbacks. For instance, praising adolescents for positive actions enhances their moral pride; however, praising their negative behaviours may inadvertently boost pride in those undesirable actions (Conejero et al., 2019). This unintended consequence may hinder the development of a positive moral identity. Using inflated praise (i.e., praise that exaggerates the accomplishments of the child) with statements like "you did an incredible job!" can be problematic, especially for children and adolescents with low self-esteem (Brummelman et al., 2014). This type of praise can overwhelm youth by setting excessively high expectations, which may demotivate them from attempting future challenging tasks for fear of failure. Moreover, using person praise (e.g., praising someone's qualities as if they were born with them, like saying, "you did a good job because you're so smart!") can decrease self-esteem, suggesting that their self-worth is a fixed trait. This makes individuals more likely to avoid challenges that might expose their perceived limitations (Brummelman et al., 2017; Schoneveld & Brummelman, 2023). Interestingly, as adolescents engage in more prosocial behaviour over time, parents often use less praise to encourage it (Rudy & Grusec, 2020). This shift occurs because adolescents tend to demonstrate proficiency in prosocial behaviour, and no longer need external validation or explicit guidance once these behaviours evolve into part of their behavioural repertoires (Rudy & Grusec, 2020). Overall, to effectively shape moral pride from early childhood onward, parents and caregivers should focus their praise on children's efforts following their prosocial actions (i.e., process praise) and refrain from using exaggerations when emphasizing their achievements

C. Parent-Child Conversations

Parent-child conversations (P-CC), particularly during storytelling, may play a vital role in the early socialization of moral pride. Research suggests that storytelling promotes the development of other moral emotions like empathy and altruism (Aram et al., 2017; Aram & Shapira, 2012; Brownell et al., 2013). Interestingly, when parents read emotion-focused storybooks with their toddlers and encourage them to label and explain the characters' emotions, toddlers are more likely to show empathic and altruistic helping—instead of helping someone with a specific task, like picking up a dropped clothespin (i.e., instrumental helping, Brownell et al., 2013; Warneken, 2016). Similar findings by Drummond and colleagues (2014) show that when parents use emotion words and elaborate on emotions during storybook reading, their children are more likely to engage in empathic helping, rather than instrumental helping. While toddlers demonstrate instrumental helping by one-years-old (Warneken &

Tomasello, 2007), emphasizing emotions during storybook reading may enhance their empathy and emotional awareness. This approach appears to encourage a preference for responding to others' emotional needs rather than focusing on tasks with more straightforward objectives. Hence, these findings suggest that guiding children to focus on emotions in stories helps them become more attuned to others' emotional needs (Brownell et al., 2013; Drummond et al., 2014).

Additionally, Cooper and colleagues (2023) found that in a wordless storybook task assessing P-CCs about self-conscious emotions in the U.S., parents less frequently highlighted pride compared to other emotions like embarrassment and guilt. This pattern may reflect a broader family-level effort to promote modesty and social conformity—even in Western contexts. This pattern suggests that parents might be selectively guiding emotional development to align with social and moral norms, perhaps shaping how children understand and express pride, more generally. This pattern was particularly evident in storybooks featuring male characters, suggesting potential gender biases. While parents might not always approach emotional discussions in a gender-neutral manner (Fivush, 1998), they often convey stereotypical gender messages based on the gender of story characters, rather than their child's gender (e.g., anger in the story is more often associated with boys, Endendijk et al., 2014; van der Pol et al., 2015). Though P-CCs may be crucial for fostering moral pride, further research is needed to understand how parents specifically emphasize and encourage this emotion.

V. Discussion

In this paper, we discussed the definition, development, and socialization of moral pride across cultures. Our goal was to bring light to this often-overlooked moral emotion and its role in shaping children's kindness and social responsibility (Hart & Matsuba, 2007; Tracy & Robins, 2007b).

A. Conceptualizing Moral Pride

We first outlined the various types of pride, their distinctions, and how they may differentially motivate moral action. Defined as a positively-valenced self-conscious emotion that arises from moral accomplishments (Hart & Matsuba, 2007; Tracy & Robins, 2007b), moral pride is theorized to motivate virtuous actions that align with one's moral values (Hart & Matsuba, 2007; Tracy & Robins, 2004). By distinguishing moral pride from other types of non-moral pride (Tracy et al., 2023; Tracy & Robins, 2007b), this review offers clarity for moral pride's potential unique influence on promoting kindness. Philosophical works have argued that moral pride promotes kindness through a feedback loop: moral pride motivates children to repeat the behaviour that sparked the positive emotion (Hume, 1739/2007; Kristjánsson, 2001). Nevertheless, psychological research has yet to provide evidence for this motivational feedback loop. Future studies are warranted to understand whether moral pride is a key mechanism in developing children's kind behaviour.

B. Model of Moral Pride Development

Based on extant (albeit limited) research on children's moral pride, we proposed a developmental model to outline the growth of moral pride from toddlerhood to adolescence (Appendix B). Within this model, we highlighted the social-emotional factors that are most important to consider for children's moral pride experiences during key developmental periods (toddlerhood, early childhood, middle to late childhood, and early adolescence). We identified toddlerhood as the period when children begin to experience self-conscious emotions such as pride and guilt due to their ability to differentiate themselves from others and reflect upon their behaviours (Hart & Matsuba, 2007; Tracy, 2007). Toddlers also begin to learn about the behaviours that are valued in their communities, which forms the basis for their moral value internalization (Rogoff, 2014). As a result, toddlers begin to experience precursors of moral pride such as nonverbal signs of pride (e.g., smiling and elevation in posture) following accomplishments in both moral and nonmoral domains (Belsky et al., 1997; Hepach et al., 2023). While toddlers may not yet experience veridical (i.e., true) moral pride, their nonverbal expressions of happiness following morally-relevant accomplishments signal that they recognize the value of moral actions (e.g., sharing).

Across the early childhood years, children start to reliably recognize nonverbal expressions of pride in themselves and others, which reflects their enhanced emotional understanding (Garcia et al., 2015). This awareness may support children's orientation to their own and others' pride-worthy actions, which, due to the rewarding nature of pride, may encourage them to experience pride in themselves and elicit pride in others. Like in toddlerhood, children continue to exhibit nonverbal expressions of pride, such as postural elevations and facial expressions of happiness (Belsky et al., 1997; Hepach et al., 2023), but begin to feel more happiness after giving than receiving kindness (Aknin et al., 2012, 2015; Hepach et al., 2023; Ross, 2017; Song et al., 2020). This signals that, during this period, children's happiness as the *benefactor* of kindness (i.e., moral pride) may become differentiated from their happiness as the *beneficiary* of kindness (i.e., gratitude). During mid to late childhood, children begin to integrate their feelings of happiness with their moral reasoning (i.e., justifications for emotions that reflect concern and care for others) following their prosocial acts, which marks the emergence of veridical moral pride (Peplak et al., 2023). This integration increases with age, and as a result, children report experiencing more frequent and more intense feelings of moral pride by late childhood (Peplak et al., 2023). This developmental period is characterized by advancements in children's sociomoral capacities such as perspective-taking and concern for others (Malti et al., 2018), which supports children's ability to experience moral pride following a range of kind acts (Etxebarria et al., 2015). Within the diversity of prosocial interactions they experience, children may begin to home in on the acts that result in the strongest feelings of moral pride and the values that are associated with those acts.

The transition into the adolescent period brings a dynamic interplay between adolescents' increasing capacity for self-reflection and a focus on the perceptions and expectations of others (Malti et al., 2021). The presence of an

audience and external validation from that audience influence adolescents' experiences of moral pride (Etxebarria et al., 2014; Tracy, 2007). Adolescents develop a heightened awareness of the behaviours that result in the most praise and gratitude from others, and as a result, they likely become motivated to adjust their behaviours to align with what is perceived as morally commendable. Consequently, the experiences of moral pride during this stage not only enhance their recognition of what is important to them in terms of their moral values, but also encourages them to continue engaging in behaviours that fuel their emerging moral identity (Krettenauer & Casey, 2015). Our proposed model of moral pride development offers valuable insights and serves as a foundational framework for understanding the growth of moral pride in children and youth.

C. Socialization of Moral Pride

Lastly, we identified and discussed potential socialization practices that contribute to the development of moral pride in young children. The literature suggests that effective socialization strategies for promoting moral pride may be the use of praise (process-oriented and not inflated) following prosocial action and meaningful emotional discussions between parents and children using storybooks (Brummelman et al., 2016; Drummond et al., 2014; Gunderson et al., 2013; Thompson, 2022; Xu et al., 2024). Although research on these socialization mechanisms is limited, it is crucial to further investigate other nonverbal mechanisms that parents pair with their praise and emotion conversations, and how these multidimensional strategies can assist caregivers in fostering moral pride in their children (Brownell et al., 2013; Drummond et al., 2014). Despite the benefits of praise and emotion conversations, parents should be mindful of their child's intrapersonal qualities, such as their level of self-esteem and gender, when deciding which socialization strategy to employ as research has shown that praise, for example, may not function in the same way for children with low compared to high self-esteems. Future research may wish to explore the effectiveness of these strategies across different cultural contexts as we currently know little about these practices in non-Western samples. Such insights could help parents and teachers identify best practices for supporting children's moral development.

D. Future Directions

To further enrich our understanding of this complex emotion, several additional factors should be considered in future research. For instance, considering additional contextual factors, including environmental influences, such the presence of an audience, across cultural contexts may help researchers better understand when and under which conditions moral pride emerges. Additionally, studying moral pride using longitudinal designs could shed light on the developmental mechanisms that support transitions from happiness following moral actions to veridical moral pride across the childhood years. This work could also illuminate the timing of transitions between pride-related capacities, which could provide a more developmentally nuanced perspective. Lastly, acknowledging the variability in socialization practices, such as differing parenting practices and peer dynamics, could further elucidate why children may feel moral pride following certain prosocial acts but not others.

E. Conclusion

Moral pride is an integral emotion in children's virtue development (Hart & Matsuba, 2007; Tangney et al., 2007), yet its emergence remains largely unexplored. Based on existing research, we propose a developmental model of moral pride that outlines key milestones in its progression from toddlerhood to early adolescence, while also highlighting how the significance of cultural values, norms, and expectations my influence its expression and internalization. This model encapsulates our current understanding of moral pride and helps to address a critical gap in the literature by elucidating its role in fostering moral identity as well (Krettenauer & Casey, 2015). By distinguishing moral pride from non-moral pride, we aim to illuminate this often-overlooked emotion and inspire interventions that may teach foundational moral values to children (e.g, fairness and care). Additionally, future research on how socialization practices and cultural contexts shape moral pride can create tailored interventions, providing evidence-based resources for parents, practitioners, and community members. Understanding the key milestones in moral pride development may be crucial for recognizing children's socioemotional growth. This insight may inform effective programs that foster ethical values and prosocial behaviour, ultimately enhancing children and community well-being.
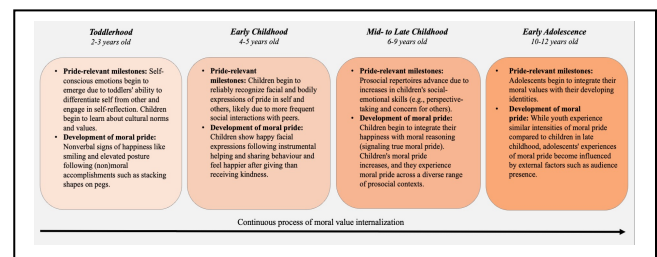
APPENDIX A

Conceptual Distinctions of Different Types of Pride
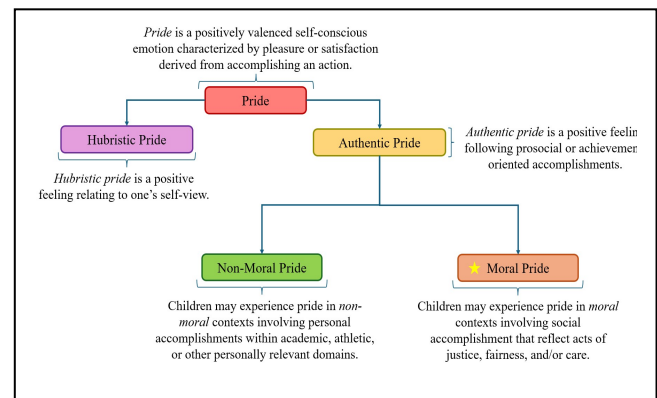
Note. These definitions are derived from the works of Tracy and colleagues (2004, 2007a, 2007b, 2023).

APPENDIX B

Model of Key Milestones and Findings in Moral Pride Development from Toddlerhood to Early Adolecence

Note. Cultural values and expectations (e.g., group harmony) may influence the extent to which children's express moral pride. That is, children from more collectivistic cultures tend to express lower levels of moral pride than children from more individualistic cultural contexts.

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Echoes of Extremism: The Impact of Social Media on Group Identity, Moral Disengagement, and Dehumanization

Mathew, Allison.

Abstract— **The digital revolution and the resulting social media platforms have brought about a transformation in human communications and intergroup relations. This paper examines the role of social media in shaping the dynamics of extremist group memberships. It explores how social media facilitates the spread of extremist ideologies and the recruitment and radicalization processes, leveraging theories such as Social Identity Theory and concepts like moral disengagement. The paper also discusses how the anonymity and global reach of social media enable these groups to not only strengthen their identities and cohesion but also engage in moral disengagement mechanisms, such as dehumanization, which rationalize extremist behaviours. Finally, it discusses the dual potential of social media to both propagate extremist views and serve as a tool for counter-radicalization efforts. Through a critical analysis of how digital environments influence group dynamics and individual behaviours, this essay contributes to the understanding of digital intergroup relations and underscores the need for strategic interventions to mitigate the adverse effects of social media on societal cohesion.**

Keywords— *Social Media, Intergroup Relations, Extremist Groups, Moral Disengagement, Radicalization*

I. Echoes of Extremism: The Impact of Social Media on Group Identity, Moral Disengagement, and Dehumanization

The emergence of digital landscapes has revolutionized the way individuals interact, raising pivotal questions about the impact of these changes on human psychology and the dynamics between different groups. As society navigates the complexities of online communication, the psychological underpinnings of how individuals and groups relate to one another in these digital spaces have become a focal point of interest. This sea change in human communications prompts a re-evaluation of traditional concepts within the field of psychology, particularly in the study of intergroup relations.

Intergroup relations explores how groups perceive, influence, and relate to one another. This field examines the formation of group identities, the roots of group conflict, and the dynamics of social inclusion and exclusion (Hogg, 2013). The rise of social media platforms has introduced a transformative arena for these intergroup interactions, marked by its capability to transcend geographical boundaries and facilitate instantaneous communication. These capabilities, as well as its vast reach and often anonymous nature, has made social media a potent tool for shaping the perceptions and relationships between diverse groups.

Among the groups most significantly impacted by this shift are extremist organizations, which have adapted to these platforms to build identity, recruit members, and disseminate their messages to a global audience. The increasing popularity of the Proud Boys, for example, illustrates how social media has amplified the reach and intensity of extremist ideologies. The Proud Boys, a right-wing extremist hate group, leverage online spaces to attract followers and reinforce their identity through shared symbols, slogans, and targeted messaging that positions them as defenders of traditional values against perceived societal threats (DeCook, 2018; Nguyen & Gokhale, 2022). This online presence facilitates an echo chamber that reinforces radical beliefs and legitimizes aggressive or exclusionary behaviours.

Extremist groups and the process of radicalization represent a significant aspect of the changing landscape of intergroup relations in the age of digital communication. Extremist groups are characterized by their adherence to radical ideologies and beliefs that often oppose mainstream societal values, sometimes advocating for dramatic changes or the use of violence to achieve their goals (Stern, 2016). The process of radicalization involves individuals progressively adopting these extremist beliefs. Social media can potentially play a notable role in this context, offering extremist groups unprecedented platforms for dissemination of their ideologies, recruitment of members, and coordination of activities. The anonymity and global reach of social media allow these groups to connect with a wider audience, while also facilitating echo chambers that reinforce radical views and accelerate the radicalization process (Klein, 2019).

Against this backdrop, this paper argues that social media has significantly altered intergroup relations, especially among extremist groups. It has supercharged moral disengagement, specifically dehumanization processes, thereby influencing these groups in previously unimaginable ways. With social media, extremist groups have found a powerful medium for organization, radicalization, and recruitment, leveraging the platform's inherent characteristics to further their ideologies.

II. Theoretical Framework

A. Social Identity Theory

Social Identity Theory, developed by Henri Tajfel and John Turner in the 1970s, provides a psychological framework for understanding how individuals' self-concepts are shaped by their affiliations with various social groups, such as ethnic groups, clubs, and national identities (Al Raffie, 2013; Huddy, 2001; Tajfel & Turner, 2004). Tajfel and Turner's (2004) theory offers insights into how and why individuals identify with certain groups and the effects of

these identifications on their behaviour and perceptions of others.

The heart of Social Identity Theory is understanding how individuals perceive themselves and others through a process that begins with social categorization, which is the classification of people into various groups (Huddy, 2001). Tajfel and Turner (2004) propose that this categorization is not just a means of organizing social information but also leads to a homogenization of perceptions within these groups, often exaggerating the similarity of those within the same group and the differences between groups. Following categorization, individuals then engage in social identification by adopting their group's identity as a core part of their self-concept. This adoption significantly influences their behaviour and attitudes as the group's characteristics, values, and norms become integrated into their personal identity. The final step—social comparison—sees individuals comparing their group favourably against others, enhancing their self-esteem based on their group membership. This comparison leads to in-group bias, where there is a preference for one's own group, and out-group discrimination, where members of other groups are viewed less favourably, ranging from subtle biases to overt hostility (Huddy, 2001).

In the realm of extremist groups, Social Identity Theory can offer insights into how strong in-group identities are formed and how out-groups are demonized. Al Raffie (2013) explains that such groups leverage the processes of social categorization and identification to foster a deep sense of belonging among their members, often centering around well-defined characteristics such as ideology, ethnicity, or religion. This strong identity is further reinforced by narratives of threat or competition from out-groups, justifying in-group bias and out-group discrimination. These dynamics not only solidify group cohesion but also rationalize a range of actions against perceived out-groups, including violence, under the guise of defending or advancing the group's interests or survival. Understanding these psychological processes provides a foundation for interventions aimed at reducing intergroup conflict and promoting inclusivity.

The Proud Boys' group dynamics on social media illustrate core principles of Social Identity Theory, as defined by Tajfel and Turner (2004). Through digital platforms, members create a strong sense of in-group identity by adopting symbols, language, and shared beliefs that distinguish them from mainstream society (Nguyen & Gokhale, 2022). This process begins with social categorization, where members and recruits are defined by common values, such as nationalism and traditional masculinity (Nguyen & Gokhale, 2022). This identity is then solidified through social identification: members adopt group symbols, slogans, and participate in exclusive online forums, which reinforce their alignment with the Proud Boys' ideology (DeCook, 2018; Rothbart & Bere, 2024).

As the group identity strengthens, social comparison amplifies in-group loyalty and out-group hostility (Tajfel & Turner, 2004). Members view themselves as protectors of traditional values, contrasting their identity against those they label as liberal or anti-nationalist threats (Nguyen & Gokhale, 2022). This distinction enhances members' self-esteem by positioning them on the morally correct side, which simultaneously justifies their hostility toward out-groups.

Social media intensifies these processes by facilitating group interactions and providing a platform for echo chambers (Klein, 2019). In this digital environment, Proud Boys members actively seek content that confirms their beliefs and discredits outsiders, strengthening the boundaries of their group identity and reducing empathy toward those outside of it (DeCook, 2018).

B. Moral Disengagement

Moral disengagement, a concept introduced by psychologist Albert Bandura, refers to the process by which individuals rationalize or justify harmful actions towards others by disengaging from the moral standards to which they typically adhere (Bandura, 2016). Bandura (2016) proposes that this process allows individuals to engage in actions that contravene their ethical standards without experiencing the cognitive dissonance that would normally ensue. Bandura identified several mechanisms—including moral justification, euphemistic labelling, and displacement of responsibility—through which moral disengagement operates, each facilitating the distancing of one's actions from one's personal moral compass.

Bandura (2016) proposes that moral justification involves reinterpreting otherwise reprehensible actions as serving a noble cause. By framing harmful behaviours as in service of a greater good, individuals can view their actions as not only acceptable but commendable. This redefinition allows individuals to align harmful actions with positive self-concepts, thus avoiding the tension between their behaviour and their moral standards. Euphemistic labelling is the employment of sanitized or neutral terms to describe harmful actions. Language plays a critical role in moral disengagement and through the use of euphemistic labelling, individuals can mask the severity or immorality of their actions. This linguistic distancing reduces the strong emotional impact usually associated with harmful behaviours, making them feel less egregious and easier to commit without moral conflict. Displacement of responsibility involves attributing one's actions to an external authority, such as a superior or societal norms, thereby diluting personal accountability. When individuals perceive their actions as dictated by others, they can dissociate themselves from the moral implications of these actions. This displacement allows individuals to view themselves as mere agents, executing orders or conforming to group norms rather than as autonomous moral agents.

Within the context of extremist groups, moral disengagement plays a central role in facilitating participation in violence and aggression (Bandura, 2016). Aly et al. (2014) explain that these groups often employ narratives and rhetoric that invoke the mechanisms of moral disengagement to justify their actions. By portraying violence as a necessary means to achieve a higher moral purpose, employing euphemistic language to describe violent acts, and emphasizing obedience to the group's ideology or to its leaders, extremist groups can significantly lower the moral barriers that would normally prevent individuals from engaging in harmful behaviours.

Aly et al. (2014) describe that the process of moral disengagement in these groups not only allows members to participate in actions that align with the group's goals but also to maintain a positive self-image. It minimizes the moral dissonance that arises from the gap between their actions and their personal ethical standards. As a result, members can support or directly engage in acts of violence and aggression without the full psychological burden of their moral implications. This disengagement is not only instrumental in sustaining participation in the group's activities but also in recruiting new members who can adopt the group's cause without facing immediate moral conflict.

The Proud Boys' rhetoric and actions online often exemplify moral disengagement, a process where individuals rationalize harmful behaviour by disconnecting from usual moral standards. DeCook (2018) explains that one way this occurs is through moral justification: members frame aggressive actions as defense of traditional values or patriotism, portraying their hostility as a noble fight to preserve their ideals. This reframing allows members to see confrontations or inflammatory behaviour as morally acceptable, even commendable.

Another mechanism they use is euphemistic labeling. Online, Proud Boys may use softened or coded language to describe violence or aggression, referring to confrontations as rallies or peaceful resistance (DeCook, 2018). This can sanitize their actions, making them appear less harmful and masking the underlying aggression.

Displacement of responsibility also plays a role; members might attribute their actions to following group leaders or responding to perceived threats by outsiders. By placing accountability on leadership or external enemies, individuals within the Proud Boys can distance themselves from the ethical consequences of their actions, viewing themselves as part of a larger cause rather than as morally responsible individuals (DeCook, 2018).

Social media amplifies these mechanisms by creating a supportive environment where members receive positive feedback for behaviour they might otherwise question (Klein, 2019). This digital validation allows for increasingly aggressive actions to be rationalized without confronting the usual moral discomfort.

C. Dehumanization

Dehumanization, another mechanism of moral disengagement, is the process by which individuals or groups are perceived as less than fully human (Bandura, 2016). According to Bandura (2016) this perception paves the way for increased aggression and reduced empathy towards those identified as outside one's own group, essentially by stripping away their human qualities. Within the dynamics of extremist groups, dehumanization serves as a powerful tool for overcoming the moral and psychological barriers that would normally prevent acts of aggression. Viewing those deemed as others as lacking in human qualities simplifies the justification needed to commit violence against them (Aly et al., 2014).

According to Bandura (2016) the process of dehumanization goes beyond simply enabling acts of violence; it actively diminishes the capacity for empathy and compassion towards the targets. Since these individuals or groups are not seen as fellow human beings with thoughts, feelings, and rights, but as mere objects to be ignored or symbols worthy of disdain, the natural human inclination towards empathy is significantly weakened. This lack of empathy is necessary for extremist groups, as it helps to maintain a clear division between the in-group and out-group, reinforcing group identity and cohesion by uniting members against a common enemy (Stern, 2016).

The impact of dehumanization can extend beyond the immediate context of violence and lead to long-term entrenchment of divisions between groups (Stern, 2016). Reducing people to less than human status can reinforce and perpetuate the cycle of violence and aggression, and make reconciliation and understanding between divided groups more challenging (Stern, 2016). The reduced capacity for empathy also hampers efforts to address the underlying issues fueling conflict, as it obstructs the ability to see the situation from the perspective of the dehumanized group (Stern, 2016).

The Proud Boys provide a real-world example of how dehumanization operates within extremist groups, especially in online spaces where anonymity and group support reduce accountability. Through social media, the Proud Boys often label out-groups—such as political opponents or marginalized communities—as threats to national identity, framing them as morally inferior or unworthy of empathy (DeCook, 2018). This portrayal not only rallies members around a common enemy but also strips the out-groups of their individuality and humanity, making hostility towards them feel justified (DeCook, 2018). The repetitive exposure to dehumanizing rhetoric within these digital echo chambers intensifies in-group cohesion and reduces empathy for those outside the group (DeCook, 2018). Consequently, this dehumanization process hinders the potential for dialogue and conflict resolution, as members become entrenched in a polarized worldview where others are seen as obstacles rather than fellow human beings (Klein, 2019).

III. EVOLUTION OF EXTREMIST GROUPS AND SOCIAL MEDIA

The historical evolution of extremist groups reveals notable shifts in the methods of communication and identity formation, largely influenced by technological advancements. Prior to the advent of social media, these groups relied heavily on traditional forms of communication such as printed materials, face-to-face meetings, and, later, websites and internet forums (Frazer, 2023; Prezelj & Zalokar, 2024). These methods, while effective in their time, had limitations in terms of reach and speed of information dissemination. Because of these limitations, the formation of group identity and the dynamics of intergroup hostility were constrained, with the result that this period was characterized by a localized approach to recruitment and radicalization, with a heavy reliance on physical community and direct interaction (Prezelj & Zalokar, 2024).

The migration of extremist group dynamics to the digital realm marked a significant transformation in their operation and impact. The introduction of digital platforms facilitated a broader engagement with potential recruits and sympathizers,

transcending geographical limitations and enabling a global reach (Prezelj & Zalokar, 2024). This shift not only expanded the audience for extremist ideologies but also streamlined the process of identity formation and group cohesion through more efficient and widespread communication channels (Prezelj & Zalokar, 2024).

With the proliferation of social media, the modern digital age ushered in new possibilities for extremist groups to engage in psychological warfare and propaganda dissemination at an unprecedented scale. It broadened the scope of intergroup interactions and potentially amplified psychological processes such as moral disengagement and dehumanization (Klein, 2019). Social media platforms, with their vast networks and algorithms, facilitate an environment where individuals can easily encounter and interact with extremist content (Prezelj & Zalokar, 2024). These platforms may allow individuals to disconnect from the ethical implications of their actions and views, thereby making it easier to justify and engage in harmful behaviours towards others (DeCook, 2018; Klein, 2019). Additionally, the rapid spread of dehumanizing rhetoric through social media can desensitize individuals to violence and aggression against perceived out-groups, further entrenching extremist ideologies and facilitating the recruitment and radicalization process (DeCook, 2018; Klein, 2019).

IV. PSYCHOLOGICAL IMPACTS OF SOCIAL MEDIA ON EXTREMIST GROUPS

A. Identity, Belonging, and Extremism

Social media facilitates anonymity while offering visibility, allowing users to explore and express aspects of their identity that resonate with extremist ideologies (Frissen, 2021). This dual capability of social media simplifies the creation of social networks that endorse extremist viewpoints, thereby potentially reinforcing the users' sense of belonging and validating their ideological alignment with the group. Thus, social media serves to consolidate extremist identities by providing a space where individuals can connect, share extremist content, and reinforce their group identity. This digital environment might also enhance the ideological cohesion of the group, because extremist messages can be rapidly tailored and focused on the issues and identities of the particular group. This renders social media an effective tool for sustaining and growing extremist movements, distinguishing it from traditional forms of social interaction that do not offer the same level of immediacy, control, specificity, and widespread reach.

The concept of echo chambers on social media further exacerbates the psychological effects of radicalization and the reinforcement of extremist views. Echo chambers occur when individuals are exposed primarily to information and opinions that reinforce their existing beliefs, effectively isolating them from opposing or dissenting viewpoints (Cinelli et al., 2021). This isolation is facilitated on social media platforms, where algorithms can curate content that aligns with the user's preferences, leading to a self-reinforcing cycle of exposure and engagement with extremist ideologies (Cinelli et al., 2021). The psychological impact of this phenomenon is profound, as it not only validates the individual's beliefs but also intensifies them, pushing some

towards more extreme positions (Cinelli et al., 2021). The echo chamber effect seems likely to contribute to the radicalization process by creating an environment where extremist views are normalized, and opposition and counter-narratives are rarely encountered, thereby reducing the opportunities for critical reflection.

B. Impact of Social Media on Dehumanization

Social media may not only disseminate extremist narratives, but it also might critically undermine the ethical barriers that would typically prevent individuals from engaging in violence and discrimination. This undermining is achieved through the strategic manipulation of information, where extremist groups craft and propagate content that frames their cause as morally superior or as a moral imperative (Frissen, 2021; Stern, 2016). The selective exposure offered by social media platforms isolates individuals from a balanced discourse, omits conflicting ethical considerations, creating an environment where the ethical implications of actions are not just overlooked, but systematically obscured.

This process of moral disengagement facilitated by social media also involves more than passive consumption of biased narratives; it requires active engagement with content. As users interact with this content—liking, sharing, and commenting—they become participants in a feedback loop that reinforces the narrative's legitimacy and their disconnection from societal moral standards (DeCook, 2018; Frissen, 2021; Klein, 2019). This cycle of validation and engagement is critical for the perpetuation of extremist ideologies, as it allows individuals to rationalize participating in, or supporting, actions that they would otherwise recognize as harmful or unethical.

Furthermore, the process of dehumanization can potentially be amplified on social media, where the portrayal of out-group members as less than human can spread rapidly and widely. The amplification of dehumanization might lie in its normalization. Injunctive societal norms refer to the shared expectations within a society regarding behaviours that are approved or disapproved of (Goldstein et al., 2008, Nolan, 2021). The constant exposure to dehumanizing rhetoric subtly modifies how users perceive these norms, making extreme viewpoints appear more acceptable and less contentious within online platforms (DeCook, 2018). Again, social media's extensive reach and the algorithms that prioritize content engagement, speed the process of normalization embedding harmful ideologies more firmly through digital interactions (DeCook, 2018; Klein, 2019). By continually circulating content that negatively portrays out-groups, social media may contribute to a gradual shift in the baseline of what is deemed acceptable to discuss or express. This shift, influenced by the digital reinforcement of injunctive norms, might lead to a broader acceptance of dehumanizing language and concepts, integrating them into the core of digital communications.

V. THE DUALISTIC NATURE OF SOCIAL MEDIA

The dual role of social media in the context of extremism embodies a complex interplay between facilitating moral disengagement and fostering moral engagement. While these platforms can amplify extremist ideologies, transforming

them into potent vehicles for the spread of divisive narratives and moral disengagement, they also could possess the inherent capability to act as powerful tools for promoting moral re-engagement and thus to counteract extremist influences. This potential for positive impact is derived from the same mechanisms that allow for the dissemination of harmful content: the vast reach, immediacy, and interactive nature of digital platforms (Frissen, 2021).

Social media's capacity to erode moral barriers, enabling individuals to rationalize and engage in extremism, conversely suggests that these platforms might also be harnessed to rebuild these moral barriers and promote ethical reflection and dialogue. Initiatives aimed at countering extremism through social media leverage the platform's extensive network to introduce narratives that emphasize peace, dialogue, and mutual understanding. These efforts are not merely attempts to counterbalance extremist content but are strategic endeavors to penetrate the echo chambers that perpetuate hate, offering alternative perspectives that promote empathy and humanization of the 'other.'

Moreover, by highlighting the stories of individuals who have disengaged from extremist ideologies and showcasing the tangible consequences of violence, social media campaigns can foster a process of moral re-engagement. This process involves reorienting users' perspectives towards recognizing the humanity in others, thereby dismantling the psychological groundwork of dehumanization. In doing so, social media can transform from a platform for moral disengagement to one that actively encourages moral reflection and engagement.

This nuanced understanding of social media's dualistic nature is important. It underlines the importance of strategic and thoughtful engagement with digital platforms, recognizing their potential to both spread extremism but also as a vital resource in the global fight against it.

VI. CONCLUDING REMARKS

The intersection of social media and modern extremist groups presents an important area of study, particularly when examined through a psychological framework. These digital platforms transcend their role as mere communication tools, potentially intensifying dangerous cognitive processes like moral disengagement and dehumanization, which are fundamental to the operation and dissemination of extremist ideologies. Inquiring into the psychological dynamics of intergroup relations reveals social media's potential impact on the construction of group identity, cohesion, and the radicalization pathway. The Proud Boys provide a clear example of how extremist groups exploit social media to foster a strong in-group identity and amplify hostility toward out-groups through dehumanizing rhetoric, reinforcing the psychological distance between members and those they oppose. Moreover, social media's capacity to amplify mechanisms that allow for the rationalization of, and engagement in, extremist actions make these platforms significant catalysts in the spread of these ideologies. The nuanced relationship between social media and the psychological processes of moral disengagement and dehumanization underscores how platform-specific designs and user interactions can contribute to the escalation of intergroup hostility and aggression and underscores the challenges posed by social media to societal cohesion and the critical need for future research to effectively confront extremism.

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Doping in Aesthetic Sports: A Body-Focused Perspective

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Abstract—An aesthetic sport is one which is differentially focused on physical appearance during performance, often invoking a specific emphasis on the thinness of athletes' bodies (Sundgot-Borgen, 1994). Research on the use of performance-enhancing drugs (PEDs) (i.e., doping) in the context of aesthetic sports is currently lacking. This paper proposes that the unique focus placed on physical appearance lends itself to the differential manifestation of doping behaviours in these sports. Given that research on doping in non-aesthetic athletes is much more prevalent than in aesthetic athletes, this paper synthesizes the former with research on body-related psychopathology (e.g., disordered eating) in aesthetic athletes. Due to the conflation between performance and appearance (i.e., thinness) in aesthetic sports, it is proposed that doping is inherently linked to the desire to "improve" physical appearance during performance. This may lead aesthetic athletes to utilize weight loss drugs to a greater degree than other athletic populations. The current paper calls for further research on the interaction between body-related psychopathology and doping in aesthetic athletes to better protect this population from the potential consequences of both phenomena.

Keywords— *Doping, Aesthetic, Sports, Performance-enhancing Drugs, Appearance-enhancing Drugs, Body Image*

I. DOPING IN AESTHETIC SPORTS: A BODY-FOCUSED PERSPECTIVE

Doping, i.e., the illicit use of performance-enhancing drugs (PEDs) in sport, has received an immense amount of media and research attention. Considerably less attention has been devoted to the ways in which athletes' motivations to dope may differ as a function of sport type. Understanding of doping motivations is particularly limited within the domain of aesthetic sports, i.e., sports that are subjectively judged based on athletes' ability to convey artistry and technical skill using their bodies (e.g., figure skating, gymnastics, diving; Kong, 2022). Aesthetic sports tend to value thinness, often leading young athletes to perceive a need to be thin in order to perform well (Francisco et al., 2012; Sundgot-Borgen, 1994; Voelker & Reel, 2015). Because of this conflation between performance and appearance (i.e., thinness), young aesthetic athletes' doping decisions are likely to be driven in part by a desire to be thinner. The current paper draws upon known cases of aesthetic doping, many of which involve classes of drugs often used for weight loss (e.g., diuretics and stimulants; Aguilar-Navarro et al., 2020); research on body-related psychopathology (e.g., disordered eating, weight preoccupation, etc.) in aesthetic athletes; research on doping in nonaesthetic athletes; and the limited research on aesthetic doping itself to propose that aesthetic doping is often motivated by the cultural conflation between thinness and athletic success.

A. Defining Aesthetic Sport

Prior to exploring the relationship between aesthetic doping and drive for thinness, it is important to define aesthetic sport as it pertains to this paper. To distinguish aesthetic sport as its own category, one may contrast it with non-aesthetic sport. Holt (2020) illustrates the difference between the two by noting that while it may be desirable in some instances, "aesthetic appeal" is not required in "purposive" (i.e., non-aesthetic) sport. Holt uses hockey as an example: scoring multiple goals, no matter what they look like, will always outweigh scoring a single goal, even if it is aesthetically appealing. Conversely, in aesthetic sports, aesthetics are the means by which elements are judged. A good example of this can be seen in the judging criteria for a camel variation spin in figure skating, wherein the grade of execution (GOE) score is negative if the position is "poor/awkward" or "[un-aesthetic]" (International Skating Union, 2024, p. 6). These criteria are subjective and focused on physical appearance, which unavoidably invokes criticism of the arrangement of an athlete's body when gauging athletic performance.

Sports commonly included under the *aesthetic* umbrella include figure skating, gymnastics, and diving (Kong, 2022). The current paper will also consider competitive and professional dance as aesthetic sports, given the importance of dancers' bodies to their craft; the high level of fitness required to be a competitive or professional dancer; and the perceived pressure, particularly within ballet environments, for dancers to be thin (Francisco et al., 2012). Despite the common view within dance communities that doping may not enhance performance to the same extent as it would for a non-aesthetic competitor (e.g., a runner), the World DanceSport Federation (2012) has regulations in place to prevent doping in dance competitions. While there is no antidoping policy in professional ballet, recreational drug use is common (Schwab, 2017). Sekulic et al. (2010) proposed doping as a potential concern in these environments, with dancers stating willingness to dope even if their health would be negatively impacted. Because of these findings, the current paper will include examples from dance and ballet when discussing aesthetic sport and aesthetic doping at large.

B. The Role of Gender

The current paper will focus primarily on the doping experiences of girls and young women in aesthetic sports. This is done because despite the relatively small body of literature, most findings point towards differential effects for girls and women. The particularly strong emphasis on thinness in aesthetic sport environments tends to facilitate girls' desire to uphold the thin ideal (Francisco et al., 2012), which girls may be more vulnerable to because of a pre-

existing and gendered drive for thinness (e.g., Magallares, 2016). Male aesthetic athletes tend to demonstrate reduced risk for body dissatisfaction compared to female aesthetic athletes (Zaccagni & Gualdi-Russo, 2023). In Voelker and Reel (2019), male figure skaters reported believing their female peers experienced stronger weight pressure within the sport. Female athletes in general have been found to cite weight loss as a reason for doping more frequently than male athletes, who tend to cite performance enhancement (Peters et al., 2005). These findings inform the current paper's decision to focus primarily on girls and women in the context of aesthetic doping, as the implicated issues appear to impact this population more frequently and severely.

A distressing trend among female aesthetic athletes who are caught doping is that many are very young when it happens. Romanian gymnast Andreea Răducan was 16 years old at the 2000 Sydney Olympics when she tested positive for pseudoephedrine, a stimulant (Roberts, 2000). She was stripped of her gold medal despite having no knowledge of consuming the substance, as it had been given to her by the Romanian team doctor under the guise of medication (Zaccardi, 2015). A similar incident occurred with Russian gymnasts Alina Kabaeva and Irina Tchachina three years later. At the 2001 World Rhythmic Gymnastics Championships, both athletes were under 20 years old and were stripped of their medals due to positive furosemide (diuretic) tests (Gymmedia, 2003). Like Răducan, Kabaeva and Tchachina believed they were taking medication, which ended up containing a banned substance (Olympics, n.d.). What these instances demonstrate is a clear and disturbing trend wherein girls are stripped of their bodily autonomy and subsequently punished for decisions made by the adults around them.

The issue of bodily autonomy is made greyer when considering doping cases wherein athlete ignorance is not provable. The most notable recent instance of this is Russian singles figure skater Kamila Valieva, who was 15 years old at the 2022 Beijing Olympics when a previous positive test for trimetazidine (a cardiac metabolic modulator) came to light (Oxley, 2022). She was cleared to skate the free program segment of the women's figure skating event but delivered an uncharacteristically mistake-ridden performance and landed in fourth place overall. She was berated by her coach, Eteri Tutberidze, upon returning to the boards, and she began to cry after her final score was announced (Bansinath, 2022). She has proposed multiple explanations for the presence of trimetazidine in her system, none of which implicated her or her coaching staff (BBC, 2024). None of these were proven and she has been banned from figure skating for four years from the date of her positive test (Ingle, 2024); been stripped of all competitive titles won after the date of her positive test; and lost her official status as the first female skater to land a quadruple jump on Olympic ice (BBC, 2024). It is perhaps easy to write her off as a "bad" athlete, a liar, a coerced child, or any such title. However, when one looks closer at the context surrounding her, it becomes evident that Valieva is not the first young athlete under Eteri Tutberidze's supervision whose body has given up on her.

At Beijing 2022, Tutberidze's two other skaters, 17-year-olds Anna Shcherbakova and Alexandra Trusova, placed first and second respectively. The latter broke into tears upon receiving a silver medal and stated she never wanted to skate again (Tétrault-Farber & Zemaryalai, 2022). Journalist investigation into Tutberidze following the public humiliation of two of her very young athletes revealed a host of claims of premature retirement, disordered eating, and chronic injury (Bansinath, 2022). Her skaters have been touted to exist on "all-powder diets" (Barneclo, 2022), to breathe in smelling salts before performing to prevent fainting from exertion (Wang, 2022), and to rinse their mouths out with water rather than swallow it during competition to prevent bloating (Meyers, 2019). It is impossible to consider the Valieva case in a vacuum because she comes from a training environment that has historically created single cycle champions who are discarded after their time has expired (Bansinath, 2022). Whether she doped knowingly or unknowingly, she is a testament to the countless girls in elite aesthetic sport who feel unbridled horror at the looming realization that their bodies will one day be unable to perform the same way. She embodies the young female athlete who is willing to do anything to avoid failure. This paper seeks to approach the fear that may propel girls and women towards doping with empathy and without stigmatizing their decisions.

II. LITERATURE REVIEW

While doping in general is a well-developed research area, the literature on aesthetic sports specifically is very sparse. The only known study providing any insight into the prevalence of doping in aesthetic sports is Aguilar-Navarro et al.'s (2020) study on the prevalence of PEDs across various sports, where gymnastics ranked among the highest in diuretic and stimulant use. Both drug classes are often used with the goal of losing weight. Diuretics, i.e., water pills, speed up the removal of water from the body (Cadwallader et al., 2010), and stimulants increase the speed of metabolism (Chester, 2011). Aesthetic doping cases implicating these substances include but are not limited to Vietnamese artistic gymnast Đỗ Thị Ngân Thương (CBC, 2008), Uzbek gymnast Luiza Galiulina (BBC, 2012), Belarusian artistic gymnast Nadzeya Vysotskaya (RDS, 2006), and Russian ice dancer Anastasia Shakun (Rowbottom, 2019).

The overrepresentation of diuretics and stimulants makes sense when one considers the strong association between the decision to dope and the desire to enhance athletic performance (Morente-Sánchez & Zabala, 2013), combined with the cultural belief in aesthetic sports that thin bodies are more successful (Kong, 2022). It is suggested that girls and young women in aesthetic sports are perceiving doping as a method of performance enhancement *through* weight loss. This conclusion has not been investigated but is indirectly supported by Rousselet et al.'s (2017) finding that those athletes who demonstrated concurrent doping and disordered eating behaviours tended to come from sports emphasizing leanness and low weight, i.e., aesthetic sports. Given the lack of clear research in this area, the current literature review will synthesize general sport doping research with studies describing body-related psychopathology (e.g., disordered eating) in aesthetic sport populations. It is argued that aesthetic doping stems from the aesthetic athlete's relationship to their body and its ability to perform.

A. Aesthetic Athletes as a Vulnerable Population

In a review of various studies on the use of appearance- and performance-enhancing drugs (APEDs), Hildebrandt et al. (2011) proposed several shared features among those APED users who demonstrated increased psychopathology and health risk associated with their APED use. This study was not specific to athletes but rather clinically significant APED use by any population. Improved sport outcomes were discussed as a possible motivating factor for APED use alongside non-sport outcomes such as improved job performance. The study intended to argue for APED use as a differential individual clinical diagnosis, but it proposed a theoretical perspective that can be used to enhance our understanding of APED use among other populations as well. Three features were identified as indicative of increased psychopathology and health risk among APED users: polypharmacy, significant body image disturbance, and a pre-occupation with diet and/or exercise. This section will use Hildebrandt et al.'s (2011) theoretical perspective to argue that aesthetic athletes experience heightened risk factors for and negative outcomes associated with APED use.

B. Polypharmacy

Hildebrandt et al. (2011) defined polypharmacy as the simultaneous use of multiple substances to either change physical appearance or enhance likelihood of personal achievement (e.g., improved sport outcomes). The authors found associations between polypharmacy and increased APED use, psychiatric and physical side effects of APED use, and intent to continue APED use. No research has investigated the phenomenon of polypharmacy in aesthetic athletes, but there has been at least one documented instance of a female aesthetic athlete testing positive for multiple substances at once: Kazakh rhythmic gymnast Sabina Ashirbayeva, who had three separate diuretics in her system at the time of her positive test (International Gymnastics Federation, 2018). In terms of research done on general female athletic populations, Nagata et al. (2021) found that female athletes' use of ergogenic supplements was positively associated with diuretic use. Thus, while the Ashirbayeva case suggests that polypharmacy is happening in elite aesthetic sports, insufficient research exists to draw any conclusions pertaining to polypharmacy in this population.

C. Significant Body Image Disturbance

The second feature identified by Hildebrandt et al. (2011, Abstract, p. 1) was "significant body image disturbance" defined as a preoccupation with physical appearance; including placing immense importance on appearance, tracking appearance changes, feeling distressed by appearance changes, and consistently evaluating appearance. Sufficient research has investigated body image disturbance in female aesthetic athletes. Disturbances tend to appear at an early age, as evidenced by Davison et al.'s (2002) finding that girls involved in aesthetic sports at ages five and seven years demonstrated higher weight concerns than girls who were not involved in aesthetic sports at one or both ages. Further, teenage female aesthetic athletes have been found to demonstrate higher Anorexia Readiness Syndrome (ARS) scores than non-aesthetic female athletes of the same age and gender, thus implicating a sub-clinical level of body image

disturbance unique to this population (Ziółkowska et al., 2022).

It has been suggested that aesthetic sport environments themselves are facilitating body image issues, as evidenced by the findings that ballet dancers' body image concerns increased the more time they spent in ballet environments (Dotti et al., 2002), and that strong identification with being a ballet dancer was associated with lowered body image (Langdon & Petracca, 2010). These findings are further supported by statements from ballet dancers regarding their training environments. At 108 pounds, Cherilyn Lee (2021) was told she would look better if she just weighed less. Kathryn Morgan witnessed another dancer being advised to try cocaine to keep her weight down (McGuire, 2020). Similar stories have been told in figure skating and gymnastics. American figure skater Gracie Gold (2019) attested to the word "fat" being thrown around frequently to describe young skaters' bodies, and American gymnast Katelyn Ohashi described coaches who frequently made negative comments about her body (Mazziotta, 2019). Countless girls and women involved in these sports have come forward to describe their environments as degrading to their own body image, as well as that of other athletes around them (e.g., Doorey, 2016; Hite, 2018; Ho, 2022; Kong, 2022; Martín, 2020; McCarvel, 2023). Aesthetic sport environments appear to be at best ignorant of the possible impact of critiquing athletes' bodies, and at worst actively complicit in the degradation of the mental health of girls and women.

D. Preoccupation with Diet and/or Exercise

Finally, aesthetic athletes appear especially vulnerable to Hildebrandt et al.'s (2011) third feature: preoccupation with diet and/or exercise. Significant research has established this as a major issue across aesthetic sports, beginning early in athletes' lives. Among high school students, disordered eating was more prevalent within those who were aesthetic athletes than those who participated in other sports (Thein-Nissenbaum et al., 2011). Importantly, female aesthetic athletes appear to be vulnerable to disordered eating even if they do not demonstrate body dissatisfaction. Ziegler et al. (1998) found that junior figure skaters (ages 12 to 22) dieted despite being satisfied with their bodies. In line with this, gymnasts (ages 13 to 20) have been shown to diet more than non-gymnasts of the same age without demonstrating higher body dissatisfaction (de Bruin et al., 2007). Stanford gymnast Addie Stonecipher recalled dieting and watching her weight as early as grade five because she believed losing weight would make her a better gymnast (Fishburne, 2020). This combination of drive for thinness alongside body satisfaction has been attributed to a "thin is going to win" belief system, wherein gymnasts' drive for thinness is rooted in a desire to enhance athletic performance rather than uphold a societal thin ideal, as is often seen in non-athletic female populations (de Bruin et al., 2007; Smolak et al., 2000).

Former ballet dancer Fumi Somehara has attested to the glorification of "having a little bit of an eating disorder" in ballet cultures (O'Flaherty, 2021). The issue is, of course, that "a little bit" is often not where it ends. A multitude of female aesthetic athletes have experienced disordered eating that has significantly impacted their physical or mental

health, including American figure skater Gracie Gold (2024), Russian figure skater Yulia Lipnitskaya (AP News, 2017), American ballet dancers Jenifer Ringer (Treleaven, 2018) and Dawn Smith-Theodore (2018), Australian diver Anabelle Smith (Shalala, 2024), British diver Andrea Spendolini-Sirieix (2023), and American ice dancer Kaitlin Hawayek (Ho, 2022). The deaths of American gymnast Christy Henrich (Ryan, 2018/1995, pp. 104-105) and American ballet dancer Heidi Guenther (Baker, 1999) have both been attributed to eating disorders. Given the overwhelming number of personal accounts from aesthetic athletes describing their experiences of disordered eating, as well as the research finding that aesthetic athletes demonstrate a unique tendency towards disordered eating without body dissatisfaction, it can be concluded that this population meets Hildebrandt et al.'s (2011) third feature in a unique and unsettling manner.

To conclude, it can be proposed that the female aesthetic athletic population meets two out of three of Hildebrandt et al.'s (2011) defining features of APED users with increased psychopathology and health risk. Insufficient research exists to draw conclusions about polypharmacy in female aesthetic athletes. The existing research on body image disturbance and preoccupation with diet and/or exercise suggests that both these features may manifest differentially within female aesthetic athletes, potentially as a result of their aesthetic sport involvement. While further research is required to solidify this conclusion, it can be suggested that female aesthetic athletes are at uniquely heightened risk for psychopathology and health issues associated with APED use.

III. Implications and Future Directions

A. Limitations and Future Directions

The primary obstacle facing our understanding of doping in female aesthetic athletes is the simple lack of research. Very few studies have explicitly investigated aesthetic athletic populations' perceptions of, intent to engage in, or attitudes towards doping. Sekulic et al. (2010) is the only known study to have investigated ballet dancers' views of doping, and Rousselet et al. (2017) is the only known study to have noted that conjunct doping and disordered eating is most prevalent in leanness, i.e., aesthetic, sports. This paper calls for researchers to investigate the prevalence and manifestation of doping behaviours in aesthetic populations. Qualitative work on female aesthetic athletes' attitudes towards doping, specifically weight loss drugs and their interaction with sport performance, would be invaluable in filling the research gap.

In a broader sense, doping research across sports is greatly hindered by a failure to acknowledge that specific sport populations have differing cultures and value systems, which will impact how doping is perceived and engaged in. For instance, aesthetic populations are generally recognized as at higher risk for body image struggles given the need to look a certain way during performance (e.g., Dotti et al., 2002; Francisco et al., 2012), which this paper has proposed as the main motivating factor behind aesthetic doping. It is important going forward that doping is acknowledged as a cultural phenomenon and that its manifestation differs depending on which sport culture is being considered.

Researchers should refrain from drawing global conclusions about doping when they have investigated a single athletic population. Doping ought to be understood as complex, multifaceted, and largely cultural in its manifestation.

Not every aesthetic sport is the same, and this is likely to be reflected in differences in doping motivations across various aesthetic sports. It is unlikely that a gymnast's motivation to dope will follow the exact developmental path as that of a ballet dancer. There may be similarities, but there will inevitably be modality-specific variability that ought to be considered. This same logic also applies to non-aesthetic sports, in that a hockey player may dope for different reasons than a sprinter. While the current paper has largely relied upon the aesthetic vs. non-aesthetic dimension, it is important as the area develops that we are able to draw clear distinctions between sports in both dimensions. As the research stands currently, however, the immediate goal is to cultivate further understanding about differences in doping at the broad aesthetic vs. non-aesthetic level.

B. Future Directions

This paper has proposed that the conflation between physical appearance and performance is in part responsible for aesthetic athletes' motivation to dope. While research tends to find that aesthetic athletes' weight preoccupation stems from a desire to improve their performance (e.g., de Bruin et al., 2007), there is little understanding of how girls and young women may be affected on a psychological level by the performance-appearance conflation. Alongside preoccupations with diet, exercise, and weight, it may also affect risk for depression, anxiety, and other forms of psychological distress. Research on the broader impacts is encouraged.

With regards to the role of body image and disordered eating in aesthetic doping, it is worth noting that many aesthetic sport organizations have begun taking steps to improve body image in their athletes. Many have started employing sports psychologists, including USA Gymnastics' Karen Cogan (n.d.) and U.S. Figure Skating's Dr. Caroline Silby (Farrell, 2024). Skate Canada (n.d.) has released a document entitled *Body Positive Guidelines* to directly address the prevalence of body image disturbance and disordered eating in its athletes. Within the world of professional ballet, dancers have begun sharing their stories and calling for changes in how bodies are viewed and discussed in the industry (e.g., McGuire, 2020). These are strong steps in the direction of transparency surrounding body image issues, which may facilitate further transparency regarding how these issues inform the decision to dope.

Importantly, the current paper's focus on the impact of body image on doping is not meant to insinuate this is the only factor that ought to be studied. Given the vast number of influences on the motivation to dope, there is room for immense methodological diversity in the field going forward. Factors that have been suggested in previous literature include team vs. individual sports, wherein team sports coaches' emphasis on a mastery climate (i.e., focusing on improving over winning) have been proposed to facilitate a lower likelihood of team sport athletes doping (Allen et al., 2015). Other suggestions include sport peers, satisfaction in life and sport contexts, and opportunities beyond sport

(Lentillon-Kaestner & Carstairs, 2010). Each of these factors is important and ought to be investigated further so as to better understand the differential manifestation of doping across sports.

IV. Conclusion

This paper has proposed a theoretical understanding of doping in aesthetic sports as largely impacted by the cultural equation of thinness with enhanced performance. This is differentially experienced by female aesthetic athletes, who tend to begin aesthetic sport involvement at a young age and are inclined to adopt their sport's cultural beliefs about the body and performance (e.g., Zaccagni & Gualdi-Russo, 2023). These athletes are proposed to gravitate towards weight loss drugs because of this. Using Hildebrandt et al.'s (2011) three factors contributing to enhanced risk and psychopathology among APED users, it was concluded that aesthetic athletes meet two of three criteria. While there is insufficient research to state whether polypharmacy is a concern in this population, it is clear that aesthetic athletes are differentially vulnerable to significant body image disturbance and a preoccupation with diet or exercise. This makes the population uniquely at risk for complications associated with APED use. Thus, it is proposed that aesthetic doping is a highly cultural phenomenon which impacts girls and young women due to their pre-existing vulnerability to issues with body image.

Following the revelation of Kamila Valieva's positive doping test at Beijing 2022, the International Skating Union (ISU) raised the minimum age for senior competition from 15 to 17, with the goal of protecting girls from "burnout, disordered eating, and long-term consequences of injury" (p. 2). They did not mention doping beyond stating that the Valieva case did not incite them to change the age limit (International Skating Union, 2022). The goal of this paper has been to further our understanding of how doping may interact with the perception of the body in aesthetic sport. If doping continues to be viewed as a distinct entity from disordered eating and related issues, as it seems to be in the aforementioned ISU statement, then the sport culture enabling these problems will continue to persist. This has already been seen in Eteri Tutberidze's training regimes, as she continues to teach quadruple jumps to girls as young as 12 years old (FS Gossips, 2024). Even with Kamila Valieva's exit, it is still Russian girls who are pushing the sport forward. It is hoped that Valieva's experience is remembered and that she will one day be free to tell her story in her own words. For now, she remains a testament to a sport that seems intent on evolving even if it must wound and shatter the lives and bodies of the girls who love it.

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Implementing Mental Skills Training in College Golf to Promote Athletic Success

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Abstract— **Mental skills encapsulates the various mental processes that support and enhance performance during competition. Over the last few years, the importance of mental skills and success in competitive sports has increased. While the literature supporting the effects of mental skills training (MST) on sporting performance is abundant, the emphasis on MST in college sports domains specifically is lacking. The goal of this paper is to address the cruciality of MST in collegiate sports and promote MST implementation in sports prior to the professional competition stage. This point is particularly relevant when considering the breadth of college sports available across North America and their associated skill sets. Athletes who participate in sports that are categorized as being more mental-forward, such as golf, would largely benefit from formal MST at the collegiate level. MST implementation would not only improve competitive results of college sports programs but would also promote success in life after college for student-athletes.**

Keywords— *Mental Skills Training, Mental Skills, College Golf, Varsity Sports, Performance*

I. IMPLEMENTING MENTAL SKILLS TRAINING IN COLLEGE GOLF TO PROMOTE ATHLETIC SUCCESS

Athletic domains are experiencing significant changes in the extent that the mental aspects of sports are gaining recognition as being more impactful to strong athletic performances compared to the physical aspects. Specifically, the awareness of mental skills and their impact on sporting successes in professional sports has increased substantially with the recent generations of professional athletes (Park & Jeon, 2023; Walsh & Du Plooy, 2023). Mental skills encapsulate the various mental processes that support and enhance performance during competition; for example, emotional management, focus and attention allocation, and dealing with pre-event nerves or anxiety are executed using mental processes (Diekfuss & Raisbeck, 2017; Walsh & Du Plooy, 2023). Mental skills training (MST) describes the specialized instruction, facilitation, and practice of these mental skills. Typically, this instruction is led by a specialist or professional in the sports psychology field (Di Fronso & Budnik-Przybylska, 2023).

Due to the increased awareness of MST's impacts, it has become largely implemented in professional sports settings. However, the implementation and use of MST has not stretched far beyond the professional sectors, and young athletes are facing challenges associated with mental skills resources available to them at the National Collegiate

Athletic Association (NCAA) varsity level. The lack of MST implementation in college sports is especially problematic for more mental-forward collegiate sports, such as golf (Diekfuss & Raisbeck, 2017). Golf is often referred to as a mental sport before it is physical, due to its high demand for a heavy mental load, long-lasting attentional focus, and emotional management (Diekfuss & Raisbeck, 2017; Finn, 2008). The goal of this paper is to address the importance of MST in college golf, in order to enhance the performance and enrich the lives of student-athletes both on and off the golf course.

II. THE OPPORTUNITY FOR MST

An athlete's journey to adopting mental skill sets that work for them and their individual playing styles or performances can be difficult and unfamiliar if not given proper guidance. The implementation of formal MST can help streamline this process more seamlessly (Thomas & Fogarty, 1997). Through MST, professional athletes are given safe spaces to explore their mental tendencies and past experiences. Field specialists and sports psychologists help professional athletes find what techniques work for them and their personal tendencies (Di Fronso & Budnik-Przybylska, 2023). These approaches in professional sports suggest that formal MST is necessary to support and facilitate successful performances, both physically and mentally.

Collegiate sports programs hold a responsibility to provide resources to help produce strong, high-performing athletes; however, the importance of MST is often overlooked for a variety of reasons often related to monetary and time constraints, and therefore not provided (Wrisberg et al., 2009). Currently, many college golf programs lack consistent mental skills support, which limits the potential successes of the current generation of collegiate golfers and college golf programs as a whole. Collegiate sports programs have an opportunity to be a catalyst for strong growth in the next generation of golfers by acknowledging the importance of mental skills in the sport and emphasizing its development.

III. MST IN ATHLETIC DOMAINS

A. The Rise of Mental Toughness in Professional Sport

Mental toughness and MST in sports have become equally, if not more, important than physical talent and skill in successful sporting performances. In previous generations of athletes, pure physical talent was a major separator between those who were successful and those who were not (Park & Jeon, 2023; Walsh & Du Plooy, 2023). With recent technological developments in athlete analysis methods, training aids, and facilities, athletes have experienced, and will continue to experience, an increase in the quality of their training and preparation (Frevel et al., 2022). These developments have directly translated to improving their

athletic performance. A majority of athletes are improving physically, thus increasing the standards and expectations for how difficult the competitive field will be in relation to physical skill across various sports (Park & Jeon, 2023). However, recent trends exhibit that athletes, who in the past would have dominated their sporting sectors due to their physical talent, are being outperformed by their counterparts who do not exhibit the same level of physical ability. The differentiating factor is the latter's use of mental skills and experience with MST (Park & Jeon, 2023). In response to the heightened competition, athletes should begin strengthening themselves mentally. Collegiate sports programs have an opportunity to promote MST, allowing athletes to improve their performance and produce better results in a changing competitive landscape.

IV. BENEFITS OF MST IMPLEMENTATION IN COLLEGE GOLF

A. Mental Energy Conservation

MST is critical in sports like golf, where in order to conserve energy, athletes experience necessary fluctuations in their attentional focus during competitions. The skills that are acquired through MST can be used to deal with these fluctuations in attentional focus. The literature suggests a relationship between a golfer's effective concentration and golf performance (Finn, 2008). Effective concentration can be defined as focusing solely on a particular task or goal while minimizing distractions. When considering the slow and intermittent nature of competitive golf, golfers are subjected to long periods of focus and thinking, therefore, the concept of effective concentration is largely influential. Collegiate golfers' arousal levels are adjusted to meet different tasking demands, and ideally, a golfer is able to intensify their focus depending on their point in a round in order to conserve mental energy (Diekfuss & Raisbeck, 2017; Finn, 2008). When executing a shot or their pre and post-shot routines, their focus will be heightened, thus burning the most mental energy. Contrastingly, their level of focus should be lowered in between shots, in order to conserve their mental energy (Diekfuss & Raisbeck, 2017). However, the inefficient burning of mental energy is commonly exhibited when golfers fixate and reflect on poor shots or decisions for too long (Davies et al., 2014; Wrisberg et al., 2009). A golfer's mental processes and physical performance are interconnected, with their mental processes often being a determinant of their physical success (Wang et al., 2021). Golfers who fixate on negative aspects like poor shots or decisions are unable to physically perform to their full potential (Davies et al., 2014; Wrisberg et al., 2009). If not taught how to compartmentalize these negative thoughts and allocate their focus and attention appropriately through MST, competitive golfers run the risk of burning attentional energy inefficiently, which affects their physical performance (Diekfuss & Raisbeck, 2017).

B. Exploring Individual Attentional Limitations

The implementation of MST will enable college golfers to cater their training and routines to their individual attentional limitations, which in turn aids them during competition. Naturally, humans hold limitations to their attentional abilities and capacities; however, the true threshold for one's attention is often unknown, and therefore overestimated (Chabris & Simons, 2010). One's ability to meaningfully attend to everything in their visual world is nearly impossible, and this is especially prevalent during task completion. In relation to attentional focus in golf, a golfer is often expected to meaningfully attend to many variables in order to execute a golf shot or swing; however, this expectation fails to recognize one's natural attentional limitations (Diekfuss & Raisbeck, 2017). Pre and post-shot routines consider various internal and external variables in order to promote proper shot execution (Davies et al., 2014). However, a golfer's ability to meaningfully attend to all of these variables is unlikely, and the effort to do so wastes mental energy. Given this variability, it is crucial for golfers to explore their attentional limits. With professional guidance and support through MST, college golfers will become more aware of, and in tune with, their individual attentional capacities (Thomas & Fogarty, 1997). This increased awareness of their attentional limitations can help them alter their training and their routines, both in practice and competition, in order to be more effective for them individually.

C. Emotion Regulation and Management

MST improves an athlete's emotion regulation, which positively contributes to an athlete's individual athletic performance. Learning to manage common feelings, such as nerves or anxiety, that may be heightened due to competition is a complex mental process (Diekfuss & Raisbeck, 2017). Furthermore, golfers can experience a wide range of emotions over the course of one round (Lundkvist et al., 2021). Specifically, fluctuations in their self-perceived emotions are common, which are positive or negative emotions provoked by external behaviours, decisions, or outcomes. While all competitive athletes experience these self-perceived emotions on some level, the relationship between an athlete's emotions and their performance is a unique case when considering its effects in golf. Given golf's slow pace, golfers may experience these self-perceived emotions more intensely and for a longer period of time compared to other athletes (Lundkvist et al., 2021). While positive self-perceived emotions can boost a golfer's confidence, negative self-perceived emotions can cause golfers to doubt themselves and increase their negative self-talk and self-doubt (Di Fronso & Budnik-Przybylska, 2023; Finn, 2008). This change in attitude and behaviour often translates into poor decision-making, performance, and outcomes, thus continuing the downward spiral. MST can help teach golfers how to compartmentalize these self-perceived emotions, which can help stop the downward spiral (Lundkvist et al., 2021). An athlete who can effectively manage and cope with these emotions will surpass the rest of the field in terms of success (Park & Jeon, 2023).

Competitive golfers are susceptible to performance anxiety, thus influencing their overall outcomes and successes. More specifically, the concept of "choking" due to increased pressure to perform well is largely prevalent among

competitive golfers (Finn, 2008). Despite quality and capable performances during "low-stakes situations" such as practices or training periods, the increased pressure and anxiety associated with competitions can undermine an athlete's sense of capability, confidence, and control (Finn, 2008). This discrepancy in performance between practices and competitions is widely experienced but can be controlled using MST. A study done by Hill et al. (2010) assessed the effect of MST that focused on developing mental toughness on choking susceptibility in athletes. The results of this study posited positive implications for MST's influence on choking under pressure, where increased mental toughness was linked to decreases in choking probability during competition. Furthermore, the intensity of the pressure that internal and external expectations impose on athletes varies based on the individual. While some athletes feel pressure negatively and perceive it as an overwhelming factor, other athletes thrive off of pressure and use it as a motivator (Thiessen et al., 2024). Therefore, helping athletes identify what their personal thresholds for pressure are and how to perceive pressure in a more positive light can help lessen the detrimental effects of performance anxiety.

D. Mental Toughness and Coping Behaviours

Important aspects of success in competitive sports are an athlete's mental toughness and ability to effectively cope with failures or challenges. Athletes with improved mental toughness have adopted a mindset that prioritizes determination and persistence over giving up (Griffith et al., 2024). Mental toughness plays a role in all aspects of competitive sports, whether it be during practice or competition; therefore, it is crucial that athletes build their mental toughness. This mindset can be developed through MST programs that target mental toughness and grit specifically. However, in order to adopt a mentally tough mindset, athletes must also utilize effective coping mechanisms. Athletes who rely on task-oriented coping (e.g. mental imagery, mindfulness, positive self-talk) are better able to develop mental toughness due to the positive effects that these coping mechanisms produce (Gaudreau & Blondin, 2004). In contrast, maladaptive methods like distraction-oriented coping (e.g. distancing, mental distraction) or disengagement-oriented coping (e.g. resignation, disengagement) often result in negative effects, thus hindering the ability to develop mental toughness.

A study done by Griffith et al. (2024) tested how effective MST was on improving mental toughness. The researchers invited Division 1 female athletes to participate in a six-week MST course related to several mental performance concepts, with mental toughness being one of them. Participants were administered surveys at three time points (pre-course, two weeks post-course, and four months post-course) to assess the athletes' individual mental toughness and coping skills over time. Griffith et al. (2024) hypothesized that the cohort's mental toughness and coping abilities would significantly improve after undergoing the MST course. The results indicated significant improvement in the cohort's mental toughness and coping skills

immediately post-course compared to their pre-course scores, with these effects remaining significantly different four months post-course (Griffith et al., 2024). Additionally, a moderately positive correlation was derived when considering mental toughness and coping skills in a bidirectional manner.

E. Transition into a High-Performing Stage

Learning to accept and adapt to the uncontrollable nature of competitive sports is a hurdle many athletes struggle to overcome (Walsh & Du Plooy, 2023). The literature suggests that golf is an "open-skill sport", which describes a sport that is executed in an ever-changing and unpredictable environment (Finn, 2008). An open-skill sport requires its athletes to consistently adapt their routines, decisions, and gameplans to account for these uncontrollable environments. As an outdoor sport, golf is subject to various external factors that can affect the outcomes. For example, weather forecasts and course conditions are fully out of a player's control but hold large effects if not considered (Diekfuss & Raisbeck, 2017). Learning to prioritize what they can control, such as commitment to their decisions and pre-round preparation, rather than fixating on things like the weather or course conditions, can help golfers transition into the high-performance sector. With adequate MST, golfers learn to accept the limits to their control, and can make adjustments to their decisions and actions according to their environments.

MST can also help highlight the benefits of post-competition reflection. In the case of negative self-perceived emotions, reflecting on these scenarios following a round can be beneficial for the golfer to further explore their personal tendencies or feelings (Chow & Luzzeri, 2019). Through MST, coaches can help facilitate a reflection process that prompts productivity, growth, and future application. Being able to turn a negative experience into a learning opportunity helps to increase an athlete's self-awareness, self-correction, and self-regulation, which is an important step to becoming a high-performance athlete (Chow & Luzzeri, 2019).

F. Balancing Athletic and Academic Commitments

College athletes find themselves in a challenging situation in which they are expected to balance multiple moving parts of their lives. They must be able to balance rigorous athletic and academic demands, while continuing to tend to their social lives and carve out time for rest and recovery (Griffith et al., 2024; Parker et al., 2021). The concepts of mental toughness and coping strategies can be applied to this situation as well. MST can not only be used to educate college athletes on adaptive strategies to cope with stress in sporting contexts, but these strategies can be applied in more general contexts as well. Relying on more task-oriented coping strategies will help combat the additional stressors present in student-athletes' lives (Wrisberg et al., 2009). For example, implementing mindfulness techniques outside of sports can help student-athletes when feeling overwhelmed. A study done by Jensen et al. (2020) assessed the effects of MST on reaction behaviours during high-stress situations in military personnel. Results indicated a significant relationship between MST and performance during periods of heightened stress. While the researchers' chosen scope is not a college

sports setting, the results can be generalized more broadly: During periods of heightened stress, individuals better equipped with mental skills will cope and perform better compared to those who are ill-equipped (Jensen et al., 2020).

G. Burnout in Student-Athletes

MST can also help mitigate burnout in college athletes. Athlete burnout can be defined as psychological, emotional, and physical exhaustion due to stress, overworking or training, and constant performance pressure (Wilczyńska et al., 2022). Burnout often occurs when the psychological, physical, or emotional costs of the activity, which in this case is sports participation, surpass the perceived benefits. This phenomenon has become increasingly prevalent among athletes, resulting in it becoming a topic of discussion in sports psychology disciplines. The concept of athlete burnout also relates to maintaining a healthy academic-sport-life balance: Deviation from equilibrium imposes additional stress and overwhelming factors on a student-athlete's life (Parker et al., 2021; Wrisberg et al., 2009). Athlete burnout results in numerous adverse outcomes; for example, depressed or anxious moods and decreases in life satisfaction. Various studies have posited implications of psychological interventions on athlete burnout. MST can stand as a psychological intervention if it is implemented to address a challenge or problem in one's life, with hopes of improvement or development (Lange-Smith et al., 2023). Therefore, some studies have suggested MST as a meaningful psychological intervention to mitigate burnout.

In a more general sense, Malins et al. (2023) used a longitudinal design to investigate the causal effects of MST on burnout in healthcare professionals. Results indicated a significant improvement in burnout levels post-MST, with these improvements remaining consistent after both follow ups. While this study does not pertain to athletes specifically, its findings do convey the idea that MST can stand as a mitigator against burnout. Through a meta-analytic study, Wilczyńska et al. (2022) investigated the effect of psychological interventions targeting mindfulness and coping on burnout cases in youth athletes. The results suggest that mindfulness interventions, a form of MST, can play an influential role in limiting athlete burnout in young athletes.

H. MST Enhances the Management of Training and Travel

Compared to other sports, golf requires athletes to allocate more time to training and competition days, given how long the sport takes to play. On average, an NCAA golf team will participate in 24 days of competition, or nine 54-hole events, with each day including approximately six to ten hours of playing time (NCAA, 2018). This count does not include travel days, days required for practice rounds, or potential competitive dates for conference, regional, or national championships that typically occur outside of the regular season. The true amount of time required for competing as a college golfer is far more than what is listed in the NCAA guidelines. Thus, when considering the time-consuming nature of the sport, mastering the ability to time-manage and allocate the appropriate hours to their studies, training, and competition is especially important for college golfers (NCAA, 2018). Through MST, student-athletes will learn how to effectively deal with the school, social, or

recovery-related aspects of their lives prior to competitions (Thompson et al., 2023). This will allow them to approach competitive events with clearer goals, higher focus, and more efficient attention allocation on the sporting task at hand.

I. Team Benefits of MST

MST can provide benefits for sports teams as well. A team constructed of well-developed individual athletes will perform and function better than a team constructed of athletes who lack mental skills (Wrisberg et al., 2009). Athletes who cannot effectively regulate their emotions on an individual level are often unable to be strong, supportive teammates (Torrence & Connelly, 2019). In contrast, athletes who can compartmentalize their personal feelings for the greater good of their teams are able to be more supportive of their teammates, exhibit sportsmanship, and communicate more effectively (Wrisberg et al., 2009). A more supportive team environment allows teams to thrive, both mentally and physically; therefore, this promotes stronger physical results (Torrence & Connelly, 2019). In addition to the physical improvements, these interpersonal developments that are acquired through MST help boost team morale and enhance team dynamics and culture (Diekfuss & Raisbeck, 2017; Wrisberg et al., 2009). While golf is an individual sport in practice, college golf is still structured as a team sport. Despite collegiate golfers competing as individual athletes on the course, their scores contribute to a larger team outcome. Thus, MST can still be used to improve team dynamics, culture, and performance in "individual team sports", like golf.

V. CONSTRAINTS AND COUNTERARGUMENTS OF MST IMPLEMENTATION

The concept of MST at the collegiate level is relatively new, therefore its implementation comes with challenges. Large barriers to implementing MST are the allocation of funding by the universities and the NCAA's regulations regarding training hours. Universities and their athletic departments prefer to allocate available funding to facilities or training staff that can be utilized more widely across the student-athlete community. Since MST should be individualistic and sport-specific, mental skills trainers are not seen as widely versatile or used in comparison to other potential investments (Feddersen et al., 2020). Universities would be required to allocate a substantial portion of their monetary resources to mental skills support, as well as the appropriate measures to maintain the MST. Moreover, the NCAA currently mandates a maximum of 20 hours of coach-initiated training per week by all teams at all division levels (NCAA, 1991). While the NCAA provides specifications around physical training guidelines, they do not highlight details about mental training of any type. As a result of this oversight, most coaches will prioritize physical training in their mandated hours (Feddersen et al., 2020). If a team were to adopt and integrate MST into their schedules consistently, coaches would have to sacrifice physical training hours in order to accommodate the likely time-consuming nature of MST.

A. Current State of MST in College Sports

The monetary and time restrictions are reasonable things to consider, especially given the importance of the quality in administration of MST and the required learning. A solution that many college programs have adopted to combat these restrictions is a group-delivery method for MST, in which teams participate in seminars that are led by general sports psychologists (Feddersen et al., 2020). While initial introductions to concepts or exercises may be sufficient using group-implemented MST, this practice assumes similarity across all athletes in terms of playing styles or preferences, and often fails to consider sports-specific training and mechanisms (Kozina et al., 2015).

Lange-Smith et al. (2023) investigated trends in efficacy of MST in sports performance using a meta-analytic approach. Overall, the researchers found that the majority of their sample studies deemed MST as a positive factor for sports performance enhancement. However, some studies in their review sample presented mixed or no evidence for performance enhancement. Lange-Smith et al. (2023) attributed these discrepancies to a lack of individualization, or rather the imposition of a "one size fits all" approach to MST. Similar to other psychological interventions, one form of MST may be beneficial to certain individuals, while simultaneously being maladaptive to others (Lange-Smith et al., 2023). To ensure optimal efficacy of MST, mental skills facilitators who work with athletes should tailor the MST to the athlete's styles of playing, learning, and regulation strategies.

For MST to be effective long-term, the delivery must eventually shift to individual sessions specific to the athlete, in order to acknowledge these individual athlete and sport differences. For example, there are golfers who prefer to focus on technical and systematic processes during competition, while others prefer to play using feel (Diekfuss & Raisbeck, 2017; Thomas & Fogarty, 1997). Since a golfer's playing style is largely influenced by individual preference and differing thought processes, this oversight is particularly harmful in "individual team sports" like golf (Diekfuss & Raisbeck, 2017). In relation to sport-specific mechanisms, it is important that those who are delivering the MST have an understanding of the particular sport, in order to provide specific mechanisms to aid with the specific sporting performance (Kozina et al., 2015).

B. Rebuttal

It is a program's responsibility to provide an environment that encourages athlete success and improvement in all areas of life. While programs continue to promote development in physical areas, such as employing quality training specialists for physical improvement, they are often unwilling to invest in the mental skills of their athletes (Wrisberg et al., 2009). Moreover, when considering the recent physical strengthening of competitive fields, mental skills must be categorized as equally, if not more, important than the physical aspects (Park & Jeon, 2023). Due to how long MST has been considered nonessential, the receptivity to and engagement in MST may be limited initially (Walsh & Du Plooy, 2023). Even if fewer teams utilize the MST, teams that do engage in it will see improvements in their performances. Engagement in MST would be especially beneficial in sports that require heightened mental skills and focus, such as golf (Diekfuss & Raisbeck, 2017; Thomas & Fogarty, 1997). A gradual implementation of MST for certain teams who participate in a mental-forward sport will also allow college sports programs to assess MST's effectiveness on a smaller scale prior to a program-wide implementation. This could help deal with potential skepticism towards MST that is rooted in monetary restrictions by lessening the high commitment to this large investment. The time and funding allocations to MST and mental resources would be worth the investment by college sports programs, seeing as it is a benefit to their athletes. Restructuring a program's money allocations to no longer solely prioritize physical training would not only allow MST investments to be more realistic and feasible, but would also further their athletes' potential successes, and the program's dominance as a whole.

VI. CONCLUSION

Given how important mental skills are to overall performance and success in golf, universities should prioritize MST for their college golf programs. Implementing MST provides athletes with skills that allow them to gain more control during competition, as well as mechanisms that help regulate emotions, nerves, and focus. In addition to individual sporting contexts, MST can help improve team dynamics and an athlete's wellbeing and skills in non-athletic settings as well. College athletic programs strive to produce successful athletes and teams; however, it is difficult to excel physically if they lack the appropriate mental skills. This notion is especially important in sports with high mental demands, such as golf. Successful collegiate golfers must hold strong mental skills, and without proper guidance and professional support, it can be challenging to accumulate these skills.

Increasing awareness of the benefits of sports-specialized and individualized MST in college sports can help push for MST implementations. More specifically, informing university sports programs and collegiate coaches about these positive effects and benefits of MST implementation can initiate the allocation of more funding and training hours to this specialized training (Walsh & Du Plooy, 2023). Student-athletes can also advocate for more top-down action from the NCAA. By providing clear guidelines about MST in training hour regulations, or implementing MST resources across various college sports programs, the NCAA has an opportunity to increase the accessibility and implementation of MST in North American collegiate sports. As a result of this, the NCAA can be a major contributing factor to the increased success in collegiate athletes at all division levels. Future research should be completed in order to derive the most efficient and cost-effective method for sports-specific and individualized MST delivery in "individual team sports", such as golf. Future generations of student-athletes will become more successful in the sports sector by mastering and balancing physical and mental skills, while also accumulating

skills that can be applied in their selected professional settings.

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Settler Colonialism, Systemic Queerphobia, and Indigiqueer Mental Health Outcomes: An Application of Geronimus's Weathering Hypothesis

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Abstract— **Geronimus's weathering hypothesis, initially derived from studies of African American women and their newborns, posited that their physical health outcomes were worsened by accumulated stress produced by long-term experiences of pervasive intersectional oppression. African American women experienced sociopolitical and economic oppression produced by the synergistic interactions of structural anti-Black racism and patriarchy. The weathering hypothesis can be extrapolated beyond African American women, and beyond physical health, as an analytic framework to understand how other less-studied intersectional groups may experience poorer mental health outcomes due to the intersections of multiple axes of oppression. The present work argues that Indigiqueer people, who exist at the intersection of Indigenous and queer identities, may similarly be weathered by their experiences of combined oppression arising from systemic forces of settler colonialism and queerphobia. After introducing the weathering hypothesis, its neuroendocrine mechanisms, and its original application to African American women, we then separately detail the ways that Indigenous and queer people in Canada experience oppression, linking the forms of oppression experienced by both populations to their respective mental health. In consideration of this discussion of the impacts of and queerphobia, we reapply Geronimus's weathering hypothesis to understand the mental health disparities experienced by Indigiqueer people and defend this recontextualization of the weathering hypothesis. In closing, we celebrate Indigiqueer vitality and issue a call to action for Canadian healthcare systems to apply a holistic intersectional lens towards viewing Indigiqueer people and their lived experiences to make meaningful progress towards Indigiqueer mental health equity.**

Keywords— *Indigiqueer, Two-Spirit, Weathering Hypothesis, Intersectionality, Mental Health Equity*

I. SETTLER COLONIALISM, SYSTEMIC QUEERPHOBIA, AND INDIGIQUEER MENTAL HEALTH OUTCOMES: AN APPLICATION OF GERONIMUS'S WEATHERING HYPOTHESIS

Indigenous and queer communities in Canada have experienced historical and ongoing systemic oppression in Canadian society, with lasting impact on the respective mental health outcomes of both populations: broadly defined for the purposes of this paper as the comparative likelihoods, incidence rates, or prevalence rates at which members of a given population may experience psychological distress, develop mental illnesses (anxiety, depression, substance use disorders), engage in self-harm, and experience suicidal ideation or suicide attempts (McKenzie et al., 2016; Kia et

al., 2021). Indigiqueer people, as termed by artist TJ Cuthand (2004), exist at the intersection of Indigenous and lesbian, gay, bisexual, transgender, and other queer identities. Thus, they uniquely experience systemic oppression related to their intersectionality: the status of belonging to multiple marginalized identities, and consequent experience of intersecting forms of systemic oppression (Crenshaw, 1991; Grzanka, 2020; Hunt, 2016; M. Robinson, 2022). For this paper, systemic oppression is defined as the operation of a societal system that divides groups on the bases of socially constructed dimensions, exercises power to maintain these divisions, and allocates power unequally to groups across each dimension (e.g. gender, race, sexuality) in multiple contexts (e.g. social, political, legal, economic) (Glasberg, 2011; Paradies, 2006; Van Wormer & Besthorn, 2011). The impact of these intersecting forms of systemic oppression on Indigiqueer mental health and lived experience still requires further study. To that end, research on Black women's intersectional challenges and their mental health outcomes gives a promising explanation that Indigiqueer people living at the intersection of Indigeneity and queerness experience disparities in mental health outcomes, because of weathering processes that are related to intersecting oppressions in the form of settler colonialism and systemic queerphobia.

Continued documentation of Indigiqueer lived experiences of mental health, as well as associated barriers and supports, have been described as instrumental in supporting collective efforts to provide culturally appropriate, evidence-based care for Indigiqueer individuals, and thereby reduce the health outcome disparities experienced by the Indigiqueer population (Beaudry et al., 2024; Bird & Robinson, 2020; Dykhuizen et al., 2022; Hunt, 2016; Robinson, 2022; Thomas et al., 2021). In their systematic review of Indigenous LGBTQ2S+ health literature, Thomas and colleagues (2021) argued that health researchers largely peripheralized the health outcomes of Indigiqueer people until the 2000s at the earliest. Even now, further study is required to explore the associations between the mental health outcomes of Indigiqueer people and the oppressive forces of *settler colonialism*, the claiming of native land by settlers and related forms of systemic oppression that altogether result in the systemic marginalization of indigenous peoples, and *systemic queerphobia*, the leveraging of power and privilege to systemically marginalize queer people,(Comeau et al., 2023; Hunt, 2016; Matheson et al., 2022; Mitchell, 2019; Robinson, 2022).

For understanding and addressing existing Indigiqueer mental health disparities, existing intersectional frameworks from health research beyond mainstream psychology may offer useful holistic, biopsychosocial lenses to examine the

systemic forces that shape Indigiqueer mental health and lived experience. Thus, this paper seeks to recontextualize *Geronimus's weathering hypothesis* to the context of the Indigiqueer lived experience. The weathering hypothesis, originated by public health scholar Arline Geronimus, is a landmark analytic framework positing that chronic exposure to cumulative, intersecting forms of systemic oppression causes individuals of intersectional experience to undergo physiological stress-related processes that promote consequent disparities in health outcomes (Geronimus et al., 2006). Commonalities can be drawn between the African American women upon whom the weathering hypothesis is based and the Indigiqueer people in Canada, who have been similarly disadvantaged by intersecting forms of systemic oppression and peripheralized by mainstream psychology. Thus, we may apply the weathering hypothesis and theorize that, similarly, the cumulative experiences of settler colonialism and queerphobia jointly prompt and prolong disparities in mental health outcomes experienced by Indigiqueer people. Applying a strengths-based approach, Indigiqueer resurgence, strengths, contributions, and perspectives are celebrated and contextualized in directions for future research, clinical work, and healthcare programming centering Indigiqueer people.

II. Geronimus's Weathering Hypothesis: Original Context, Application and Mechanisms

The weathering hypothesis states that oppression experienced by an intersectional group accumulates as an allostatic load, the cumulative physiological strain from psychological stressors related to intersectional oppressions (Geronimus et al., 2006; McEwen, 1993). Chronically high allostatic loads resulting from intersecting oppressions can disrupt the hypothalamic-adrenal-pituitary (HPA) axis, a fundamental component of the body's stress response system (Stephens et al., 2014; McEwen, 2022). These disruptions can induce epigenetic and cellular changes that make individuals more physiologically reactive to their own hormonal stress responses, and thus at higher risk to mental illness and suicide (Meaney et al., 1989). In context, long-term exposure to intersecting oppressions induces measurable neuroendocrine changes that have put African American women at risk of poorer mental health outcomes (Allen et al., 2019). For detailing the lived experience and mental health outcomes of African American women, research from the United States will be exclusively used to ensure geographic specificity. However, for the purposes of discussing queer and Indigenous people in Canada, Canadian research will be used for geographic specificity, with the exception of topics that have not been explored or replicated outside of American research, such instances will be specified.

III. Linking Intersections: African American Women and Indigiqueer People in Canada

Despite their cultural and geographical differences, African American women and Indigiqueer people in Canada share a key similarity in that they both represent intersectional groups (Bird & Robinson, 2020). From this key similarity spring many others, chief among these for the purposes of this paper are that both groups (a) occupy the intersection of two identities marginalized by their respective societies and thereby experience the cumulative impact of two intersecting forms of systemic oppression, b) contend with poorer mental health outcomes compared to the general American and Canadian populations respectively, and (c) have remained underrepresented and underprioritized in mainstream psychology (Bird & Robinson, 2020; Brotman et al., 2002; Dykhuizen et al., 2022; Geronimus et al., 2006 Hunt, 2016; Lewis, 2023; Spates, 2012). To the last point, Geronimus and colleagues (2006) in fact formulated the weathering hypothesis in the historical context that African American women's lived experience of stress arising from the intersection of racism and misogyny had, until that point, rarely been centered outside of literature produced by female African American scholars themselves. Indigiqueer people in Canada similarly find their perspectives and lived experiences insufficiently documented, despite their status as valued members of their communities and contributors to culturally centered research and practice (Beaudry et al., 2024; Bird & Robinson, 2020; Dykhuizen et al., 2022; Hunt, 2016; Robinson, 2022; Thomas et al., 2021). Although the literature examining Indigiqueer health outcomes has increased since 2009, Indigiqueer health outcomes remain underexamined, possibly requiring additional theory to guide future research (Thomas et al., 2021). After expanding on the similarities between the circumstances of African American women and Indigiqueer people (or Indigenous and queer communities separately), we leverage Geronimus' weathering hypothesis as a theoretical framework that identifies oppressive factors influencing Indigiqueer mental health outcomes and contextualizes these in the experience of Indigiqueer people as an intersectional group.

IV. Common Experience of Intersecting Forms of Oppression

Many foundational studies of intersectionality investigating the specific experience of African American women explored the impact of what Bailey (2010) later termed as misogynoir, the intersection of oppressions relating to systemic anti-Black racism and patriarchy, oppressive systems upheld by society and government to marginalize women, as described by feminist scholars (Geronimus et al., 2006; Ortner, 2022). (Geronimus et al., 2006; Lewis, 2023). As Black people, African American women were, and continue to be, marginalized by American government and society through slavery, segregation, and present forms of systemic racism (Banaji et al., 2021). In addition to the stress related to experiences of anti-Black racism, African American women also experience other long-term stressors posed by patriarchy. Similarly, Indigiqueer people experience the intersecting oppressions of settler colonialism and systemic queerphobia (Hunt, 2016; Robinson, 2022). As Geronimus argues that African American women are weathered by the long-term stressors posed by systemic racism and patriarchy, so too may be Indigiqueer people as they exist at a doubly marginalized intersection.

A. Common Experiences of Oppression in Policing and the Legal System

One particularly persistent and prominent form of misogynoir experienced by African American women is the pervasive implicit stereotype that they are more aggressive and more likely to engage in criminal acts compared to White American women (Ghavami & Peplau, 2013; Thiem et al.,

2019). This stereotype contributes to discriminatory overpolicing and overincarceration of African American women, which in turn increases the likelihood of experiencing externalizing mental health symptoms and generalized anxiety (Alang et al., 2021; Harris & Cortés, 2022; Judson et al., 2024; Thiem et al., 2019). Canadian legal systems have likewise engaged in systemic discrimination against the Indigenous population (Clark, 2019; Rudin, 2008). Indigenous communities are policed more aggressively, but also receive less responsive assistance when Indigenous individuals themselves are the victims of crime; within queer communities, Indigiqueer people are more likely to be surveilled, and thus more likely to be charged and convicted of crimes, but also less likely to have their safety prioritized and defended by police (Clark, 2019; DeGagne, 2020). Hébert and colleagues (2022) similarly note that Indigiqueer people in Canada report experiencing more frequent police surveillance and violent police encounters than White queer Canadians. Indigenous offenders are not only at higher risk of receiving more punitive sentences than White offenders, but also at a 25% higher likelihood than White offenders to receive longer sentences, even though Indigenous offenders typically committed less violent crimes (Alberton et al., 2021; EagleWoman, 2019). It follows that, despite representing 4.5% of the Canadian population, Indigenous adults still comprise 29% of people currently incarcerated in federal penitentiaries (Malakieh, 2020; Robinson et al., 2023). The attempts of Canadian judiciaries to mitigate Indigenous overrepresentation among the incarcerated population, namely the Gladue report, have been criticized for failing to reduce overrepresentation, which has been interpreted as the ongoing colonial legacy of excessive policing and sentencing of Indigenous individuals (Government of Canada, 2023; Rudin, 2008; Welsh & Ogloff, 2008).

While Canadian police and courts perpetuate discriminatory policing and incarceration, Canadian carceral systems neglect to meet the needs of incarcerated Indigenous people. An audit of British Columbian correctional centres found that 9 of 10 Indigenous individuals had diagnosed mental health or substance use disorders, but roughly 1 in 3 did not receive immediate mental health services, with no rationale for the denial of care; nearly 1 in 5 currently incarcerated did not receive mental health services at all during their incarceration (Pickup, 2023). Little research has been conducted in Canada to examine how a lack of mental health supports affects mental health outcomes for incarcerated Indigenous people; however, in consideration of the fact that 9 of 10 Indigenous prisoners surveyed had diagnosed psychological disorders, it stands to reason that their health would not improve without ongoing care, exacerbating the mental health inequities experienced by Indigenous people (Pickup, 2023). To that end, existing research has demonstrated that a lack of support for mental health and substance use disorders is especially hazardous for recently released Indigenous individuals, including Indigiqueer individuals, who experience higher risks of suicide and overdose (Hébert et al., 2022; Watson et al., 2022). The application of Geronimus's weathering hypothesis suggests that collective experience and awareness of ongoing anti-Indigenous and queerphobic discrimination in police interactions, courts, and penitentiaries can pose an ever-present oppression-related stressor that weathers Indigiqueer people through chronic stress, possibly contributing to poorer mental health outcomes. In this context, the hypothesis reveals future directions for psychological research to examine the lived experiences of Indigiqueer people with police, court, and incarceration, and an alternate lens that mental health workers working across the legal system can use to support the experiences of Indigiqueer people across judicial and carceral processes.

B. Common Experiences of Oppression in the Labour Market and Workforce

African American women also experience oppression in the labour market and workforce, namely in the forms of inequities in income, opportunities for career growth, and employment; such inequities have been linked to higher incidence rates of depressive disorders and other mental illnesses (Economic Policy Institute, 2022; Maume, 1999; Patel et al., 2018; U.S. Bureau of Labor Statistics, 2021). In the same vein, 72% of Indigiqueer people surveyed across Canada reported experiences of hiring and workplace discrimination, which respondents described as limiting opportunities for employment and career growth, perpetuating income inequities (Rodomar et al., 2023). Indigiqueer people have reported experiencing microaggressions or overt harassment based on their queerness or Indigeneity, which contributes to increased likelihood of psychological distress and pressure to conceal their queerness and/or Indigeneity in the workplace (McConnell et al., 2018; Rodomar et al., 2023; Salerno et al., 2023). Among the larger population of queer people in the Canadian workforce, the prevalence of precarious employment—temporary or irregular employment where job control and continued work opportunities are typically low, and job loss is more likely—is three times higher than among straight workers (Kinitz et al., 2023). The greater Indigenous population is similarly more likely to be underemployed or precariously employed than non-Indigenous Canadians (Bleakney et al., 2024). Thus, Indigiqueer people may be more likely to experience underemployment and unemployment due to the systemic labour inequities faced by the two communities to which they belong (Rodomar et al., 2023). Disproportionate risk of unemployment could place Indigiqueer people at greater likelihood of anxiety, depression, maladaptive alcohol use, and suicide, thereby exacerbating mental health disparities (Arena et al., 2023; Canadian Public Health Association, 1996; Skinner, 2023; van Eersel et al., 2021). Moreover, following Geronimus's weathering hypothesis, constant experiences of microaggressions, overt harassment and heightened threats of underemployment or unemployment related to systemic queerphobia and settler colonialism may weather Indigiqueer people through the process of chronic stress. Hence, the application of the weathering hypothesis importantly highlights the systemic and intersectional nature of the inequalities experienced by Indigiqueer workers, demanding that psychologists conduct further research to devise interventions that can mitigate inequalities encountered both in the labour market and workforce.

C. Common Experiences of Oppression in Healthcare

African-American women have long testified to their experiences of historical and ongoing medical racism when seeking healthcare, which manifest prominently in disproportionate maternal morbidity, maternal health conditions that arise from, or worsen due to, pregnancy and childbirth, and mortality. Chinn and colleagues (2021) attribute the disparities in healthcare to chronic instances of medical discrimination-related stress and inadequate communication from American healthcare providers. Indigenous communities face a similarly contentious legacy of medical racism at the hands of Canadian healthcare providers. Of over 5,000 surveyed Canadian healthcare workers, including mental health workers, thirty-five percent reported witnessing anti-Indigenous discrimination in healthcare settings firsthand (Turpel-Lafond et al., 2020). Given this historical and ongoing medical mistreatment, it is understandable that over 1 in 5 Indigenous people feel unsafe accessing mental health and substance use services in Canada; 21.8% of surveyed First Nations individuals living on-reserve correspondingly report that the healthcare they are provided is inadequate (Loppie & Wien, 2022; Turpel-Lafond et al., 2020). Thus, Indigenous people encounter barriers accessing help for the mental health challenges they face, because interacting with Canadian mental health services may in fact add to their current mental health stressors.

In addition to the barriers posed by medical racism, Indigiqueer people have also historically been discouraged from seeking healthcare due to systemic queerphobia among healthcare workers in Indigenous communities, which has compelled some Indigiqueer individuals to migrate to urban centers to seek healthcare (Brotman et al., 2002; Hunt, 2016). Hunt (2016) finds that migration effectively forces Indigiqueer individuals to leave communities that do not offer safe healthcare access for queer people, only to encounter systemic queerphobic and settler colonial oppression in urban centres, exacerbating their existing health needs, particularly those related to being Indigiqueer. Still, other Indigiqueer individuals choose to conceal their queerness as a precaution when seeking healthcare resources; the pressure on Indigiqueer individuals to hide their needs presents an additional barrier to well-being and also ultimately obscures the specific healthcare needs of the population (Brotman et al., 2002; Hunt, 2016). Thus, collective experiences and awareness of inadequate or inhospitable healthcare may not only add to existing health needs of Indigiqueer people related or unrelated to their Indigiqueer identities but pose their own long-term stressors that arises from the intersection of settler colonialism and systemic queerphobia, further worsening Indigiqueer mental health outcomes through the process of stress-induced weathering as per Geronimus's hypothesis. In the realm of healthcare, the hypothesis also highlights that psychological research must attend to Indigiqueer lived experiences of healthcare across Indigenous communities and urban centers and provides a uniquely intersectional and trauma-informed model that diverse care providers can leverage to welcome and properly respond to Indigiqueer individuals and their health needs.

D. Common Experiences of Peripheralization by Mainstream Psychology

Mainstream psychology has often perpetuated and exacerbated systemic inequities faced by intersectional groups--an experience shared by African American women and Indigiqueer people in Canada alike. The key participation of African American women in struggles for racial and gender equity is belied by their relative invisibility in psychological research compared to African American men and White women (Billups et al., 2022; Sesko & Biernat, 2016; Spates, 2012). This status of invisibility in psychological research perpetuates the mental health inequities experienced by African American women because fewer studies have been conducted, and healthcare initiatives have been developed, to understand and address the specific needs of this demographic (Lewis, 2023; Spates, 2012). Indigiqueer people have also been peripheralized by mainstream psychology; when they have been centered by settler psychological research and healthcare systems, they have usually been viewed through a paternalistic deficit lens divorced from context, which ultimately perpetuates mental health inequity by promoting widespread notions and feelings of hopelessness and inferiority (Dykhuizen et al., 2022; Hyett, 2019; M. Thomas et al., 2021).

V. DEFENDING THE REAPPLICATION OF THE WEATHERING HYPOTHESIS TO INDIGIQUEER HEALTH

A. Current Evidence on Indigiqueer Mental Health Outcomes

The existing research on Indigiqueer people, though emergent, nevertheless reflects mental health disparities among this population, corroborating what the application of Geronimus' weathering hypothesis would suggest. A survey conducted in Toronto recorded that 32% of Indigenous cisgender-heterosexual respondents reported excellent or very good mental health, compared to 29% of Indigiqueer respondents (Seventh Generation Midwives Toronto, 2018). The same survey observed that 43.5% and 14.5% of Indigiqueer respondents had been diagnosed with anxiety disorders and bipolar disorders, respectively, compared to 18.0% and 7.6% Indigenous cisgender-heterosexual respondents. Existing literature documents that Indigiqueer people are more likely to have a history of suicidal ideation and suicide attempts; suicidality is especially common among transgender Indigiqueer individualswith 76% transgender Indigiqueer respondents in Ontario reporting a history of suicidal ideation, compared to the overall Ontario transgender average of 36% (Bauer et al., 2013; Scheim et al., 2013). Robinson's (2022) review of Indigiqueer mental health needs found multiple studies reporting that Indigiqueer people engage in illegal drug use and problematic drinking as coping strategies to manage mood more frequently than Indigenous cisgender-heterosexual people. These findings suggest that Indigiqueer populations experience mental health disparities related to lived experiences of settler colonialism and systemic queerphobia, which expose Indigiqueer populations to chronic psychological stress arising from constant exposure to these intersecting forms of oppression (Robinson, 2022; Scheim et al., 2013; Seventh Generation Midwives Toronto, 2018). This process is akin to that posited by Gerominus and colleagues (2006) in the weathering

hypothesis, wherein intersecting oppressions induce long-term physiological and psychological stress that adversely impacts African-American women's health across a diverse range of outcomes. Thus, given the findings and associations reported by existing studies on Indigiqueer populations, as well as aforementioned studies drawing similar links between oppression-related chronic stress and poorer mental health outcomes among larger Indigenous populations, there is evidence to indicate that Indigiqueer people may undergo comparable processes of weathering that contribute to poorer mental health outcomes.

B. Criticism of the Weathering Hypothesis and Implications of its Recontextualization

However, Geronimus's weathering hypothesis—the mechanism through which oppression is argued to impact mental health outcomes—has received criticism. Thomas (2006) argues that, since Black female life expectancies have at times exceeded White male life expectancies, Geronimus's weathering hypothesis did not robustly demonstrate that the discrimination faced by intersectional groups necessarily caused pathological weathering. The implication of Thomas' (2006) argument is ultimately that Geronimus's weathering hypothesis would not be applicable to the Indigiqueer population, if the life expectancies of Indigiqueer people were comparable in some respect to non-Indigenous and non-queer life expectancies. Indeed, the life expectancies of some Indigenous peoples, like First Nations women, Métis men, and Métis women, are increasing on par with non-Indigenous Canadians (Tjepkema et al., 2019). Regardless, however, life expectancy fails to represent the uniquely deficient mental health outcomes that Indigenous peoples nevertheless face. Although some life expectancy metrics, like length or rate of increase, of certain Indigenous groups may presently exceed non-Indigenous groups, Indigenous peoples still experience mental health disparities due to the unique oppression they endure (Anderson, 2021; Kumar & Tjepkema, 2019; Loppie & Wien, 2022). This is doubly true for Indigiqueer people, who not only bear the pervasive consequences of Canadian settler colonialism and anti-Indigenous prejudice, but also the queerphobia that likewise permeates Canadian society. Thus, Thomas' (2006) use of life expectancy metrics to appraise the weathering hypothesis does not properly address the poorer mental health outcomes of Indigiqueer people.

Forde et al. (2019) also criticize that many studies confirming Geronimus's weathering hypothesis have treated their focus populations—namely Hispanic and Black people in America— as homogeneous groups. They correctly point out that these studies overlook that health disparities within minorities often exist along ethnic or cultural lines: for example, between white European-Hispanic and brown *mestizo* Hispanic peoples. However, substantial data supports the presence of mental health weathering across First Nations, Inuit, and Métis groups. In other words, the respective mental health outcomes of these racially heterogeneous groups are all similarly worsened by settler colonialism, which implies that the weathering hypothesis is applicable to racially diverse Indigenous peoples. More specifically to Indigiqueer mental health, interview studies have identified similar experiences of racist and queerphobic oppression from culturally diverse samples of Indigiqueer peoples (Ansloos et al., 2021). Similarly, systematic reviews

have also highlighted common mental health disparities facing Indigiqueer communities across North America and Australia (Thomas et al., 2021; Jolivette, 2018). This suggests that the weathering hypothesis is highly applicable to Indigiqueer mental health across diverse Indigenous communities in Canada.

VI. UPLIFTING THE VITALITY OF INDIGIQUEER PEOPLE IN CANADA, AND AFRICAN AMERICAN WOMEN

Despite the legacies of systemic anti-Black racism and patriarchy, African American women nevertheless continue to persist and thrive as foundational members of their communities, and important contributors to psychological research and mental health equity (Lewis, 2023; Ruggs, 2023; Spates, 2012). Hine (2007) emphasizes the crucial centuries-long involvement of African American women in advancing social justice, citizenship rights, as well as equity in healthcare, housing, employment, and education, for African American people and for American women. In the context of psychology more specifically, Ruggs (2023), and Spates (2012) both underline that female African American scholars and research participants have been fundamental in developing psychology's conceptualization, application, and current knowledge of racialization, intersectionality, and cross-cultural differences. African American female researchers and clinicians continue to be at the forefront of leveraging intersectional approaches through research and clinical practices to mitigate the systemic impacts of patriarchy and anti-Black racism and improve mental health outcomes for African American women (Lewis, 2023; Ruggs, 2023). The work of African American psychologists and mental health workers cultivates culturally appropriate, radical and liberatory forms of healing, that meaningfully address the impacts of systemic anti-Black racism and patriarchy (Lewis, 2023). Therefore, the pursuit of mental health equity for African American women demands that they themselves be increasingly centered in all aspects of psychological research (Lewis, 2023; Spates, 2012). Further studies must also be supported so that their valuable lived experiences, perspectives, and ideas can be brought into the focus of mainstream psychology.

In the same spirit as African American women, Indigiqueer people have historically occupied culturally fundamental roles in their communities and continue to reclaim Indigenous worldviews of identity while making invaluable contributions to community resilience and wellbeing. Prior to the establishment of the Canadian settler-colonial state, many Indigenous communities maintained diverse, but generally non-binary, non-cisheteronormative and fluid views of gender and sexuality (Hunt, 2016; Robinson, 2019; Sheppard & Mayo, 2013). Many such communities openly embraced their members who claimed non-cisgender or non-heterosexual identities, often assigning them culturally valuable roles in their society as knowledge keepers, spiritual leaders, healers, and communicators (Hunt, 2016). However, as a result of British, French, and now Canadian settler colonialism, Indigenous peoples endured widespread intergenerational trauma and continue to face systemic anti-Indigenous prejudice in Canadian society and structures, alongside widespread intergenerational trauma (Allan & Smylie, 2015; Matheson et al., 2022; Mitchell et al.,

2019). Indigenous children were forcibly separated from their communities and enrolled in church-managed vocational schooling where they endured sociocultural assimilation, religious indoctrination, as well as rampant child abuse and neglect (Allan & Smylie, 2015; Matheson et al., 2022; Mitchell et al., 2019). Partly as a result, Indigenous individuals, including Indigiqueer individuals, are correspondingly more likely to abuse alcohol, report symptoms of depression, and experience suicidal ideation and attempts, especially in response to thoughts and feelings related to historical trauma and loss (Bombay et al., 2012; Bombay et al., 2014; Elias et al., 2012; McQuaid et al., 2017).

Despite the imposition of Euro-Christian principles of cis-heterosexism by settlers, and the ongoing impacts of settler colonialism and systemic queerphobia, Indigiqueer people have managed to defend and reclaim their notions of queerness within their cultural contexts (Hunt, 2016; Polonijo et al., 2022; Spurway et al., 2020). There has been a resurgence of Indigenous communities embarking on cultural shifts away from settler norms that reject Indigiqueer people, towards pre-colonial worldviews (Brotman et al., 2002; Hunt, 2016; Spurway et al., 2020). Empowered by community acceptance and integration of their identities, many Indigiqueer people continue to resume their precolonial roles as community leaders by engaging with—and revitalizing—traditional ceremonies, gathering and healing practices that promote community belonging, positive self-identity, and spiritual health (Hunt, 2016; Spurway et al., 2022). It bears emphasizing that Indigiqueer people as a collective have continued to thrive and apply self-determination, asserting their identities and strategizing to navigate the Canadian sociopolitical systems that marginalize them through both settler colonialism and systemic queerphobia (Hunt, 2016; Spurway et al., 2020). Indigiqueer cultural contributions facilitate the continued health and resiliency of their communities, preserve traditional worldviews, and thereby resist the eroding effects of settler colonialism on Indigenous ways of knowing (Royal Commission on Aboriginal Peoples, 1996, as cited in Hunt, 2016). Through their contributions to the preservation and revitalization of Indigenous worldviews on gender and sexuality, Indigiqueer people continue to advocate for culturally appropriate, strengths-based, and identity-affirming forms of psychological research and practice (Hunt, 2016). The continued advocacy and involvement of Indigiqueer people can foster the improvement of psychology's understanding of and provision of care for Indigiqueer people and Indigenous communities at large.

VII. MOVING FORWARD: DIRECTIONS FOR CONTINUED RESEARCH AND PROVISION OF CARE

One key insight that emerges from the application of the weathering hypothesis is that simply centering Indigenous populations or queer populations in psychological research is not enough; researchers must also bring specific attention to intersectional subdemographics like Indigiqueer people, who may experience highly divergent mental health outcomes by way of their intersectional lived experiences. Likewise, applying the weathering hypothesis suggests that launching mental healthcare initiatives oriented for Indigenous populations is insufficient if the care provided is not also intentionally designed with consideration for Indigiqueer people. The weathering hypothesis altogether suggests that Canadian psychological researchers, clinicians, and mental healthcare systems must view Indigiqueer people through an intersectional lens; applying this contextualized and holistic approach will enable meaningful progress towards restoring mental health equity to this vital community.

Presently, psychological research and healthcare resources relating to Indigiqueer mental health both continue to require bolstering, despite a contemporary resurgence in the reclamation of Indigiqueer identity (Hunt, 2016). More in-depth studies of Indigiqueer lived experiences are required to equip researchers, policymakers, and care providers who work with Indigenous and/or queer populations, and who thusly bear the obligation of learning how to respond to Indigiqueer concerns in a culturally appropriate manner (Hunt, 2016; Spurway et al., 2020). The continuation of research on Indigiqueer mental health, and provision of care that uniquely focuses on providing culturally appropriate mental health services to Indigiqueer people, also necessitates that public institutions fund these initiatives. It cannot be overstated that Indigiqueer people represent a highly vital intersectional group whose voices must be valued in research and healthcare programming (Bird & Robinson, 2020; Brotman et al., 2002; Dykhuizen et al., 2022; Hunt, 2016; Robinson, 2022; Thomas et al., 2021). Indigiqueer strengths, worldviews, and priorities must be continuously incorporated, valued, and amplified in the development of research that seeks to understand their lived experiences of contributors and barriers to mental wellness, and in the development of healthcare initiatives that aim to support their mental health outcomes and reduce inequities (Brotman et al., 2002). Researchers and clinicians alike must continuously apply an intersectional, strengths-based, and identity-affirming approach in their own work, and advocate for systemic improvements that facilitate Indigiqueer-centered research and healthcare programming (Brotman et al., 2002; Dykhuizen et al., 2022). In the same breath, the governmental and academic bodies that employ these professionals must reconfigure systems of clinical work or scholarship to accommodate and incentivize collaborations with Indigiqueer individuals and groups (Dykhuizen et al., 2022). From their review of Indigiqueer health literature, Dykhuizen and colleagues (2022) found evidence to argue that a continuous process of community-based participatory research will help to close persistent mental health inequities for Indigiqueer communities, while allowing settler institutions to make efforts toward decolonization.

Contemporary clinical interventions that affirm and center Indigiqueer individuals, identities, and perspectives have shown promise in improving the mental health outcomes of Indigiqueer people (Beaudry et al., 2024). Sylliboy (2021), a Two-Spirit researcher himself, organized a healthcare

initiative for Indigiqueer individuals: a sharing circle that doubled as a qualitative study, based on Two-Eyed Seeing, a Mi'kmaw co-learning methodology. For data analysis, Sylliboy's (2021) study used the medicine wheel model to make sense of Indigiqueer wellbeing as inextricably physical, mental, emotional, and spiritual. The integration of Two-Eyed Seeing methods and the medicine wheel model throughout the study was believed to affirm Indigiqueer lived experience as holistic, indivisible narratives; the sharing circle was ultimately observed to have fostered collective hope, resilience, and reconnection to culture among its participants. These findings agree with Walters and colleagues' (2001) account that Indigiqueer gatherings bolster Indigiqueer mental health; Bird and Robinson (2020) argue that such collective healing methods are impactful opportunities for affirming individuals in their reclamation of their full intersectional selves.

Two other evidence-based wellness strategies that demonstrate the value of Indigiqueer worldviews in research and clinical interventions are the FIRST (Family, Information, Relationship, Safe-Space, and Two-Eyed Treatment) and Five Factor Wellness Inventory (5F-WEL) tools (Beaudry et al., 2024; Latimer et al., 2020; McKinney et al., 2020; Sylliboy & Hovey, 2020). Though these tools differ procedurally, both are person-centered methods for nonjudgmental care provision that incorporate elements of Two-Eyed Seeing to assess the wellness of Indigenous individuals through a holistic and relational lens. In their review of Indigenous healing strategies, Beaudry and colleagues (2024) have supported both FIRST and 5F-WEL as sufficiently contextualized and strengths-based wellness assessment tools that mental healthcare providers should use to build respectful, equal-partnership therapeutic alliances with Indigiqueer clients (Sylliboy & Hovey, 2020; Latimer et al., 2020). According to Beaudry and colleagues (2024), mental healthcare providers may be able to build mutual trust and sustainable help-seeking relationships periodically by assessing their regular clients using FIRST and 5F-WEL, which enables clinicians to track their clients' progress while affirming their strengths. Beaudry and colleagues (2024) also advocate for affirmative therapy as a particular therapeutic modality that is highly applicable for supporting Indigiqueer individuals, due to its strengths-based approach of identifying protective factors in the client's context, empowering the caller with self-care practices and cultural affirmation, and reinforcing the caller's self-identity and self-advocacy skills.

Although researchers and institutions should continue to support the research and development of culturally effective clinical tools, practices, and interventions for Indigiqueer mental health, research has found abundant healing potential for Indigiqueer people in engaging with traditional Indigenous healing strategies beyond the clinical context (Bird & Robinson, 2020). Connecting with specific cultural practices like smudging, sharing circles, or sweat lodges has been reported to reduce suicidality among Indigiqueer people; it has been posited that engaging in these practices once quashed by the settler-colonial state helps Indigiqueer people develop protective traits like resilience, self-affirmation, and positive self-identity (Ferlatte et al., 2018; Fieland et al., 2007; Sylliboy, 2021). Evidence from contemporary clinical work, as well as literature about traditional healing strategies, altogether suggests that improving Indigiqueer mental health outcomes depends heavily on applying a holistic, intersectional lens to provide strengths-based, identity-affirming care.

VIII. CONCLUSION

In summary, the forms of systemic oppression experienced by Indigiqueer people can be understood separately, but viewing Indigiqueer lived experience holistically through the intersectional lens demanded by the weathering hypothesis enables a more complete picture of Indigiqueer lived experience and mental health to emerge: one where the Indigiqueer individual simultaneously experiences multiple axes of oppression across sociopolitical, legal, and economic contexts, and—most importantly—thrives in spite of them. Abundant hope and valuable knowledge can be found in the unflagging strengths and unique perspectives of Indigiqueer people, the ever-expanding knowledge and application of culturally appropriate healing practices, as well as the efforts of widespread Indigenous communities to welcome these individuals and restore them to their historically central roles as community leaders. Applying the weathering hypothesis as an exploratory tool gives credence to the possibility that adopting centrally intersectional approaches in both research and clinical work will be fundamental in contextualizing our understanding of Indigiqueer mental health, and supporting the Indigiqueer population through culturally appropriate healthcare programming so that wide-ranging disparities in mental health outcomes can be effectively remedied.

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The Implications of Awe as a Preventative Treatment for Young Children at Risk of Aggressive Behaviours

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Abstract— **Existing literature suggests that a positive correlation exists between awe and prosociality and that prosociality and aggression are negatively correlated. Young children who exhibit aggressive behaviours have a greater risk of experiencing peer rejection, delinquency, psychiatric illnesses, academic problems, and suicidal behaviours. Current treatments typically target clinical aggression and are not preventative or effective for young children without developed executive functioning skills. As such, creating accessible and appropriate preventative treatments for young children at risk of future aggressive behaviours or those displaying subclinical aggression should be a priority. Since awe is commonly experienced in childhood it may be effective in preventing the development or worsening of aggressive behaviours in young children compared to existing treatments that require cognitive reappraisal. Awe could reduce aggressive behaviours by promoting prosocial thoughts, curiosity about the world, and positive affect. While it is possible that awe does not directly influence aggression, its positive relationship with prosociality could decrease stress, promote curiosity, induce amusement, and foster well-being, which may have spillover effects into other domains of functioning and promote positive developmental outcomes such as improved family dynamics, reduced aggression and increased positive affect. This proposed treatment also has the potential to help differentiate children who need additional targeted support.**

Keywords— *Awe, Aggression, Aggressive Behaviours, Children, Prevention, Intervention*

I. THE IMPLICATIONS OF AWE AS A PREVENTATIVE TREATMENT FOR YOUNG CHILDREN AT RISK OF AGGRESSIVE BEHAVIOURS

Research suggests that awe is positively correlated with prosocial behaviour (Li et al., 2024), and increases prosocial tendencies in children (Stamkou et al., 2023). While little research has investigated the direct relationship between prosociality and aggression, evidence suggests they are negatively correlated (Vecchio et al., 2023). This raises the possibility that early childhood aggression can be reduced by awe.

A search on APA PsycINFO for "awe" and "prosocial*" at the time of this writing resulted in 72 results from 2003 onwards. The asterisk indicates that any word which begins with "prosocial" is used to complete the search (i.e., prosocial, prosociality). Of these, 63 have been published in academic journals, and only 43 are categorized as being empirical. Of the 43, only one study by Stamkou et al. (2023), as referenced throughout this paper, is relevant to children under 13 years of age. When searching for "awe" and "aggressi*" on APA PsycINFO following the steps above, only 8 works appear to have been published in academic journals, and none of them are relevant to children under 13 years of age. While the positive relationship between awe and prosociality has been consistently reported (Li et al., 2024), using awe as a preventative treatment to reduce aggression in children has not yet been explored.

Awe in children is characterized by the feeling of being small in a vast world and the need to create alternative explanations for stimuli that cannot be understood or explained by existing mental concepts (Keltner & Haidt, 2003; Stamkou et al., 2023). Awe typically arises from unexpected events that motivate explanation-seeking (Valdesolo et al., 2017), and although awe is commonly encountered in childhood, little research has explored this topic (Aknin et al., 2018). Relatedly, while the scientific study of awe is quite new (Allen, 2018), awe has been found to increase prosociality, which includes actions recognized to benefit others such as providing comfort and sharing possessions (Eisenberg et al., 2015; Penner et al., 2005; Stamkou et al., 2023; Li et al., 2024). Prosociality has been associated with positive developmental outcomes related to academic achievement, psychological health, and peer and teacher relationships (Buckley et al., 2024; Longobardi et al., 2021; Padilla-Walker et al., 2014).

On the other hand, children who exhibit aggressive behaviours have a greater risk of developing psychiatric concerns such as Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD). ODD is characterized by abnormally excessive non-compliance or aggressive behaviours, and can be followed by CD, which involves serious rule violations or harm to people and animals (Baker, 2016). As suggested by a recent meta-analysis, 4.6% of children under 19 in high-income countries have been diagnosed with ODD or CD (Barican et al., 2022). Similarly, a study based in Ontario found that in 2014, 8.3% of children aged 4–11 had a diagnosis of ODD or CD (Georgiades et al., 2019). Children may also be at a greater risk of experiencing peer rejection, future delinquency, and academic problems (Archer & Coyne, 2005; Evans et al., 2019; Liu et al., 2013; Rivenbark et al., 2018; Shepard & Dickstein, 2009), and are more likely to engage in future suicidal behaviour and substance abuse (Evans et al., 2019; Liu et al., 2013; Tremblay et al., 1999).

Some children are at a greater risk of developing aggressive behaviours. They may have risk factors related to genetics (Liu et al., 2013), personality traits and temperament (Lone & Albotuaiba, 2022; Vanderbilt-Adriance et al., 2015), low socioeconomic status (SES), and poor or inconsistent parenting (American Psychological Association [APA], 2014; Girard et al., 2019; Baker, 2016; Campbell, 1995).

Other risk factors exist, such as being Indigenous (Vance et al., 2022; Beals et al., 1997), and having an incarcerated parent (Norman & Enebrink, 2023; Martin, 2017; Thomson et al., 2020) or a mother with a history of antisocial behaviours (i.e., violations of rules and rights of others; Toro et al., 2020) (Tremblay et al., 2004; Hay et al., 2021). The likelihood becomes greater when multiple risk factors are present (Shepard & Dickstein, 2009).

However, having a risk factor does not mean a child will develop clinically significant aggressive behaviours. Protective factors including higher SES, nutrition, relationships with adults who are good influences, parental warmth and responsivity, and maternal social support (Liu et al., 2004; Vanderbilt-Adriance et al., 2015; Williams et al., 2019) can offset the potential effects of risk factors and promote healthy development.

Although conduct-related concerns are the number one reason for children to be referred to mental health services, the demand for treatments far exceeds their availability (Pikard et al., 2018; Saggar et al., 2019; Shepard & Dickstein, 2009).

II. Awe as an Effective Prevention

While the relationship between aggression and prosociality is complex and still being investigated, some research suggests that they are negatively correlated in childhood (Vecchio et al., 2023). Since awe is associated with increased prosociality (Stamkou et al., 2023; Li et al., 2024), aggressive behaviours in young children can potentially be discouraged by the experience of awe. This would likely be a more pleasant, approachable, and appropriate method than interventions such as Cognitive Behavioural Therapy (CBT) or Anger Control Training (ACT), which will be discussed in further detail later in this paper. Awe may decrease aggression by shifting an individual's attention to the greater social world, thereby increasing prosocial thought, by decreasing experienced stress, and fostering amusement and happiness.

One study found that children's prosocial tendencies increased after viewing awe-inducing films (Stamkou et al., 2023). The researchers assessed prosocial behaviour by the number of items that participants counted for a food bank and the increased number of ticket donations after exposure to awe. Children primed with awe acted more prosocially because the world seemed more expansive and magical to them (Stamkou et al., 2023; Yoshie, 2023). Additionally, this effect occurs because awe turns an individual's attention away from themselves and to the social world around them (Ejova et al., 2021; Perlin & Li, 2020; Prade & Saroglou, 2016; Stamkou et al., 2023). Increased prosociality is correlated with increased prosocial thought such as ideas concerning the well-being of others which may in turn inhibit aggression (Vecchio et al., 2023). Thus, by increasing prosociality, levels of aggression in children should decrease.

Moreover, Bai et al. (2021) found that undergraduate participants who felt awe reported greater life satisfaction and less daily stress. Since life satisfaction and aggression are negatively correlated and stress and aggression are positively correlated (Chatterjee, 2013; Contreras & Novaco, 2023), awe may also be related to aggression through stress.

Relatedly, awe can reduce the number of negative emotions an individual may experience (Koh et al., 2019), which likely affects cognition and behaviour.

At the time of this writing, no experimental study has tried to reduce aggression in children by inducing awe, but one study by Yang et al. (2016) found that college-aged students were less aggressive in a shooter game following exposure to awe. This effect occurred because the participants felt smaller in an expansive world and felt positive emotions such as amusement. Although the generalizability of this paper is limited since the participants were not children, it may relate to how children could behave less aggressively. The feelings of amusement, wonder, and curiosity induced by awe may encourage the child to interact with the world in a purposeful and novel way as a means to seek new knowledge (Kidd & Hayden, 2015), thus, promoting more consideration about the consequences of their actions.

Additionally, it is important to note that some existing studies have found inconclusive or contradicting results. While Li et al.'s (2024) meta-analysis suggests a moderate relationship between awe and prosociality, the researchers also describe how some studies did not find an increase in prosocial behaviour after exposure to awe.

Awe as prevention for aggressive behaviours in young children should be implemented at the selective or indicated level and provided when conduct problems first become concerning for families with risk factors. Selective or indicated interventions using awe can promote general well-being and encourage children to view the world with more curiosity and wonder (Stamkou et al., 2023; Keltner & Haidt, 2003). Universal preventions target whole populations regardless of risk factors, selective preventions target people with heightened risk (i.e., low SES), and indicated preventions target those with a high likelihood of a disease (i.e., regarding childhood aggression, having a mother with a history of antisocial behaviour; Tremblay et al., 2004) (Singh et al., 2022).

Since the feeling of awe is elicited by things that promote explanation-seeking such as moving films, beautiful artworks, nature, and remarkable human behaviour (Keltner & Haidt, 2003; Valdesolo et al., 2017), children may benefit from watching demonstrations of helpful behaviours or videos that elicit awe (Stamkou et al., 2023). Instructing participants to engage in activities that promote awe between sessions could be incorporated into the treatment.

Similarly, hosting treatment sessions in local and easily accessible locations like community recreation centers, schools, or hospital outpatient facilities may increase accessibility (Singh et al., 2022; Yu-Lefler et al., 2023; Williams et al., 2020). Hosting group sessions would allow more families to participate in the program alongside one or two group mediators, and could also allow parents and young children to communicate with each other, potentially expanding their social network and support systems.

However, given the dearth of research on this subject matter and the challenges associated with developing clinical treatments, it is difficult to outline how this treatment may proceed. Additional research on this topic can help clinicians

and researchers develop a more realistic and empirically supported treatment plan.

III. EXISTING TREATMENTS AND THEIR DEFICIENCIES

Awe as a preventative treatment should be further investigated since many existing treatments target older children, have poor accessibility, and are specialized to treat clinically significant problem behaviours such as conduct disorders.

Children acquire executive functioning (EF) skills between ages 6-8. These skills include a working memory, the ability to control attention, and self-control (Best & Miller, 2010). Existing treatments previously mentioned like CBT and ACT work by manipulating EF skills through training the child to reappraise social situations, critically challenge their thoughts, and self-regulate their emotions (Sukhodolsky et al., 2016). These treatments are based on the assumption that the aggressive behaviours being exhibited are age-inappropriate, and while that may be true for older children, those without developed EF may not understand the harm their behaviours cause (Vanderbilt-Adriance et al., 2015). Thus, while CBT is effective at treating childhood aggression, it is only recommended for use in children aged 7 or older (Matthys & Schutter, 2021; Mohlman & Gorman, 2005).

Parent management training programs (PMTs) are also used to treat disruptive and aggressive behaviours and work in children from birth to 12 years of age (Shepard & Dickstein, 2009). PMTs focus on parenting practices such as enforcing appropriate discipline, increasing parental involvement, breaking coercive interactions by teaching communication skills, and encouraging positive parent-child interactions (Shepard & Dickstein, 2009; Saggar et al., 2019). However, CBT, ACT, and PMTs are often inaccessible due to their popularity and effectiveness.

CBT, ACT, and PMTs entail long waiting times, with waitlists for CBT typically reaching 18 weeks in the UK (Punton et al., 2022). Similarly, in 2017, children under 19 years of age in Ontario had to wait an average of almost 10 weeks for counselling and therapy (Children's Mental Health Ontario, 2020). It is possible that while waiting for treatment, families may need to relocate, experience an economic burden such as losing a job, or experience additional stressors like a family member's death, all of which can exacerbate the child's aggression as well as any mental and physical health challenges the family may be experiencing (Shepard & Dickstein, 2009).

In addition, these services require access to qualified mental health providers and often necessitate physician referrals (Pikard et al., 2018; Punton et al., 2022) which typically take place when symptoms of an illness start negatively impacting daily functioning. This, in effect, further delays the onset of treatment. Considering the greater risk of negative outcomes, such as developing psychiatric concerns, experiencing rejection, delinquency, academic problems, and suicidal behaviours (Archer & Coyne, 2005; Evans et al., 2019; Liu et al., 2013; Rivenbark et al., 2018; Shepard & Dickstein, 2009), developing alternative and accessible ways to mitigate aggressive behaviours in early childhood is necessary.

Due to the high demand, children with more severe presentations of aggression are typically prioritized (Tran, 2024; Singh et al., 2021). As a result, these treatments are used to manage and reduce clinically significant aggression (i.e., ODD and CD) rather than to prevent minor aggressions in at-risk children from worsening. While this is not necessarily bad, this means that a child's problematic behaviours are often left untreated until they become severe enough to require immediate intervention. Children may be required to have an ODD or CD diagnosis before being admitted into these programs or to receive medical insurance coverage for mental health services (Bender, 2019). Though some free or low-cost mental health services in Canada accept self-referrals (Pikard et al., 2018), not all families live near these services or are eligible to participate due to stringent eligibility criteria.

Additionally, untreated aggressive behaviours can negatively influence family dynamics and are often reinforced by inadequate support (Horwitz et al., 2011), making them more difficult to treat (Shepard & Dickstein, 2009; Baker, 2016). Parents may feel uncertain of what to do about their child's aggressive behaviours (Sisterhen & Wy, 2023) and may attempt to manage or reduce their child's aggression without seeking professional support. Parents may intentionally or unintentionally use coercion or engage in inconsistent or harmful parenting practices, which in effect increases the risk that their child's aggressive behaviours persist or worsen (Campbell, 1995; Girard et al., 2019; Baker, 2016). However, given that there is research to support the benefits of early prevention (Singh et al., 2022, Moroz et al., 2020), more focus on prevention efforts must be made to reduce aggressive behaviours while they are still subclinical.

IV. PREVENTION AND EARLY INTERVENTION SUCCESS

Finally, prevention efforts exist to prevent the development, delay the onset, or prevent a disorder or illness from returning, and can also be used to prevent comorbidities from developing (Singh et al., 2022). Regarding aggression, early treatments often reduce the risk of aggressive behaviours, have lasting effects, reduce the need for specialized care, and are cost-effective.

Physical aggression is thought to develop between 12–24 months of age (Tremblay et al., 1999) while relational forms, such as name-calling, are present by age 4 and are thought to develop by 36 months (Archer & Coyne, 2005; Casas & Bower, 2018). Notably, physical aggression exhibited by infants at 6 months of age, as measured by actions like biting or kicking, can predict their physical aggression as toddlers (Hay et al., 2014). That being said, while the goal may be to inflict harm, aggression can also arise from provocation or annoyance and may not be intended to deliberately hurt others (Murray-Close & Ostrov, 2009; Kruglanski et al., 2023; Girard et al., 2019).

While a child's predisposition to aggression, also known as trait aggression, is consistent across time (Kersten & Greitemeyer, 2024; Yang et al., 2016; Tremblay & Belchevski, 2004), children who participate in prevention programs are less likely to develop clinically significant concerns since these programs reduce the effects of risk

factors (i.e., by teaching coping strategies) and increase or strengthen protective factors (i.e., through healthy relationships with caring adults) (APA, 2014). Furthermore, early prevention efforts yield better outcomes than those pursued later in life possibly because childhood is a sensitive and vulnerable time of rapid development (Tremblay et al., 2004; Singh et al., 2022; Colizzi et al., 2020).

Related to the universal, selective, and targeted categories mentioned earlier, preventions can also be categorized as primary, secondary, or tertiary. Primary preventions target the general public or people at risk of an illness, secondary preventions aim to mitigate the effects of a disorder early to prevent it from worsening, and tertiary preventions focus on treatment and recovery (Singh et al., 2022; Perski et al., 2017).

Tobin & Sugai (2005) examined primary, secondary, and tertiary prevention adaptations of Positive Behavior Support which is intended for young children at risk of behavioural problems. The researchers found that primary prevention, a school-wide effort to reinforce appropriate behaviours, was effective for 60% of participants. Teacher ratings of students' self-control increased after primary and secondary prevention, while cooperation increased greatly after secondary prevention. Internalizing behaviours such as rumination, depression, worry, or social isolation, and externalizing behaviours like tantrums, aggression, hyperactivity, or impulsivity (Vergunst et al., 2023) decreased while academic performance increased on all prevention levels. To further support the effectiveness of preventions, one meta-analysis reports that the majority of selected and indicated preventions for childhood aggressive behaviours had at least small effect sizes (Hendricks et al., 2018).

Similarly, home visitation programs for low-income, unmarried women have resulted in positive outcomes such as reduced instances of child abuse and neglect 15 years later, suggesting that prevention efforts also have long-lasting effects (Olds et al., 1997). Likewise, the Incredible Years program, an early PMT intervention that works with parents of children aged 3–8 with ODD symptoms, demonstrates that improvements in the child's conduct in home and school settings can be maintained for at least 2 years after treatment ends (Maag & Katsiyannis, 2010; Shepard & Dickstein, 2009; Reid et al., 2003). While the Incredible Years program is not a prevention program, it is included to demonstrate that early efforts to prevent or mitigate harm can have lasting impacts.

Prevention efforts greatly reduce the need for specialized considerations like case management or mental health treatment teams since they target people who have yet to develop problematic behaviours. Thus, less extensive training is required for service providers, and trained volunteers can assist mental healthcare workers like social workers or registered clinical counsellors in providing preventative care. Additionally, prevention programs can be as short as one session (Shepard & Dickstein, 2009) and take place in community centres or local schools (Singh et al., 2022; Yu-Lefler et al., 2023; Williams et al., 2020). As a result, prevention efforts are more cost-effective than interventions (Singh et al., 2022; APA, 2014; Moroz et al., 2020).

Given the poor mental and physical health associated with aggressive behaviours in children, families with aggressive children on average utilize more healthcare services than families with less aggressive children (Raaijmakers et al., 2011; Rivenbark et al., 2018). By age 28, people with CD are estimated to cost 10 times more than people without CD (Scott et al., 2001). These costs are attributed to factors like housing and residential care, healthcare, government benefits, divorce, special education, inpatient services, and crime (Scott et al., 2001; Rivenbark et al., 2018; Foster et al., 2005). By working with concerned families before children develop and receive diagnoses for ODD or CD, the potential future economic burden of clinically significant aggression can be reduced.

V. LIMITATIONS AND FUTURE DIRECTIONS

As mentioned at the beginning of this paper, very little research has explored this topic. It is hard to know if awe can effectively reduce aggression in children, and more research is necessary to better conceptualize awe in children, the relationship between awe and aggression, and the relationship between prosociality and aggression.

Relatedly, one treatment cannot mitigate all types of aggressive behaviours in children, given their complexity and the intricacies of childhood development (Murray-Close & Ostrov, 2009; Colizzi et al., 2020). Aggressive behaviours are subject to individual differences and become more varied with age (Underwood et al., 2009). In addition, aggression is heavily influenced by interactions between biological and environmental factors (Shepard & Dickstein, 2009) and targeting childhood aggressive behaviours through awe may be ineffective when issues such as parental job instability, child abuse, interparental violence, inadequate housing, racism, discrimination, and immigration are concerned (Cavell et al., 2023; Afifi et al., 2009; Boden et al., 2010). Aggressive behaviours are also related to the quality of the parent-child relationship and parental involvement. This is partly why PMT programs are so effective (Lakhdir et al., 2020, Shepard & Dickstein, 2009; Saggar et al., 2019).

While prevention efforts for aggression are effective, they are not common in part due to the ambiguity of subclinical and clinical presentations. Mental disorders are not observable in the way that physical ones are and determining with certainty when symptoms of a particular disorder (i.e., ODD) have become clinically significant is difficult (Singh et al., 2022). In addition, there is currently a shortage of mental healthcare workers (Mongelli et al., 2020), which may make developing, testing, and moderating new prevention programs challenging. However, as mentioned earlier, mental health workers such as social workers can help provide at-risk children with preventative care alongside trained volunteers.

VI. CONCLUSION

Awe as a selective and indicated prevention program for aggressive behaviours in children could mitigate and prevent negative developmental outcomes like future delinquency and poor mental health. As a selective or indicated prevention program, costs to the public are expected to

decrease while access to support for families with risk factors will likely increase. Mitigating the effects of risk factors in early childhood by providing accessible support to families is vital, and current treatments are not sufficient in that regard. Awe has been shown to decrease aggression in adult populations and increase prosociality in all ages, and as such, awe may directly or indirectly decrease aggression in young children. Since awe is commonly experienced in childhood, it is an age-appropriate way to prevent the development or worsening of aggressive behaviours in young children. Given the evidence that exists about the relationship between awe, prosociality, and aggression, as well as the risks associated with untreated aggressive behaviours, it is recommended that awe as a potential treatment be further investigated.

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