McNair Journal

FALL ▪ 2023

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On the Cover:
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Message from the Director

It is with great pride that I introduce this outstanding collection of articles from the 2022-2023 participants of the MU McNair Scholars Program. The papers presented here represent the culmination of a year's worth of research and scholarly activity. They reflect the energy, creativity and effort of the scholars, themselves as well as the careful guidance, support and diligence of their faculty mentors. Six very diverse topics are explored and reported in their entirety within this interdisciplinary journal. While their subject matter and journalistic styles may differ, they, along with the other McNair Scholars listed in this publication, are to be commended for their persistence and dedication to this rigorous undergraduate research experience that will benefit them greatly in their pursuits of graduate studies.

Since 1989, the McNair Program has been a University-wide effort that continues to attract students and faculty mentors from a variety of academic departments and fields of inquiry. Students have had the opportunity to learn about the importance of earning an advanced degree, while gaining the skills and tools that will guide them through their future academic journeys. The program proudly bears the name of astronaut and scientist, Dr. Ronald E. McNair, who died in the Challenger explosion in 1986. His accomplishments and high standards set an outstanding example for these developing scholars.

I am truly honored to be associated with an initiative such as this. So many faculty, staff and administrative members of the MU community have worked to ensure a supportive and cohesive environment that prepares these exceptional students for graduate programs. We are proud to highlight the work of these talented young researchers, in this, the twenty-fifth edition of the MU McNair Journal. Our best wishes go out to all of them as they continue to move along their scholastic continuum.

Natalie Downer, PhD
Director, MU McNair Scholars Program

The McNair Scholars Program

BACKGROUND

College students who are considering study beyond the baccalaureate level realize their dreams through the McNair Scholars Program at the University of Missouri-Columbia (MU). MU was one of the original fourteen universities selected to develop a program established by the U.S. Department of Education and named for astronaut and Challenger crew member Ronald E. McNair. The purpose of the program is to provide enriching experiences that prepare eligible students for doctoral study.

PROGRAM ELEMENTS

One of the most exciting aspects of the McNair Scholars Program is the opportunity for junior or senior undergraduate students to participate in research experiences. McNair Scholars receive stipends to conduct research and engage in other scholarly activities with faculty mentors from the areas in which they hope to pursue graduate study. These research internships are either for the academic year or for the summer session and are under the supervision of faculty mentors. For academic year internships, students work a minimum of ten hours per week during the fall and winter semesters. Summer interns work full-time for ten weeks.

McNair Scholars also attend professional conferences with their mentors, go to graduate school fairs, prepare for graduate school entrance exams, receive guidance through the graduate school application process and obtain information on securing fellowships, graduate assistantships, and loans. Participants learn about graduate school life, advanced library skills, and effective ways to present their work. At the completion of the research internships at MU, McNair Scholars make formal presentations of their research to faculty and peers at the McNair Scholars Conference and submit papers summarizing their work. Students who participated as juniors the previous year continue in the program during their senior year for graduate school placement and to further develop their skills.

ELIGIBILITY

Participants must meet grade point average standards; be U.S. citizens or permanent residents; and qualify as either a first generation college student with an income level established by the U.S. Department of Education, or a member of a group that is underrepresented in graduate education.

All students who wish to be involved submit an application to the program. A committee composed of faculty members and representatives from both the graduate dean's office and the McNair Scholars Program selects participants and approves faculty mentors. Research internships are offered to those students who are juniors or seniors and are identified as having the greatest potential for pursuing doctoral studies.

The role of partner presence in mothers' neural responding to infant crying

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Ashley M. Groh

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Department of Psychological Sciences

Jocelyn Lamore is originally from Springfield, MO and is an active member of the Psychology Club, Psi Chi.

This past summer, she once again volunteered at the Fulton State Hospital and continued her research in Dr. Ashley Groh's lab, where she started work on a Mizzou Forward Training Grant.

Currently, Jocelyn is applying to graduate programs in clinical psychology.

Crying is a potent infant distress cue evolved to signal infant needs and elicit caregiver response (Bowlby, 1982). Research indicates that change in mothers' frontal brain activation reflects mothers' capacity to engage and respond to infant distress, linked with empathy and attachment security (Coan, Allen & McKnight, 2006; Groh et al., 2015; Killeen & Teti, 2013). However, a key limitation is that parents' responses are examined when they are alone, although social partners support one another during times of challenge (Bowlby, 1982; Coan et. al., 2006). The aim of the current study was to examine whether partner presence supports mothers' neural responding to infant distress, and whether this varies according to attachment representations and internalizing problems. The sample comprised of 60 mothers who completed a standard EEG baseline and listened to an audio recording of infant crying while EEG was monitored. Half of the sample completed this procedure alone and half with their partner holding their hand. Alpha power (8-13 Hz) was extracted and natural logarithm transformed at the F3 and F4 sites within each condition. Our findings indicate no significant association between condition (together v. separate) and mothers' frontal EEG asymmetry, although we did find evidence that mothers' frontal EEG asymmetry to infant crying is influenced by an interaction occurring between partner presence and mothers' attachment representation. Our discussion emphasizes the importance to further investigate parental response to infant cues in the context of their broader social relationships.

Introduction

Infant crying is a potent distress cue evolved to signal important infant needs to caregivers (e.g. threat, illness, hunger, pain; Bowlby, 1982). Caregiver response to infant distress is crucial to study due to its significance to child outcomes (Dix, 1991; Frodi, 1995). A wealth of research shows that crying elicits autonomic physiological and brain responding from parents, thought to support or undermine their capacity to respond to infant distress (Groh & Roisman, 2009; Leerkes et al., 2016). However, a key limitation of this

research is that the parent's response is typically examined when they are alone. According to attachment and social baseline theories, the presence of social partners supports individuals' response to challenges (Bowlby, 1982; Coan et al., 2006).
Electroencephalogram (EEG) can be used to measure neural activity and analyzed for emotional and behavior implications (Coan & Allen, 2004). In particular, when listening to infant distress, greater shifts in frontal EEG asymmetry toward relative right activation has been linked with attachment security and greater empathic responding (Coan, Allen & McKnight, 2006; Killeen & Teti, 2012; Groh et al., 2015). In this study we examined whether mothers' neural responding when listening to infant distress was modulated by partner presence, with the expectation that partner presence would support mothers' emotional engagement with infant distress as reflected by greater shifts in frontal EEG asymmetry. Both attachment security and depression will be reviewed as moderators, given that research has shown that both of these aspects impact mothers' response to infant distress (Diego et al., 2006; Groh et al., 2015; Groh & Roisman, 2009; Laurent & Ablow, 2012).

Importance of Infant Distress and Caregiver Response

Infant distress is an integral component of parent-child relationships. According to Bowlby (1982), there are two types of behaviors that mediate attachment–signaling behavior and approach behavior. Signaling behavior creates an effect with the purpose of bringing the mother to the child, including "social signals" such as crying, smiling, babbling, etc. (Bowlby, 1982). In particular, crying is a potent cue that signals conditions such as hunger and pain which then elicits a caregiver response in order to protect, feed, or comfort.

How caregivers respond to infant distress is important for children's subsequent adjustment. The cry of an infant is perceived as an aversive cue that elicits a strong emotional and physiological response (Frodi & Lamb, 1980). The process in which a caregiver manages their own physiological and emotional response to infant cues is thought to support caregivers' capacity to effectively respond to infant needs (Groh & Roisman, 2009; Leerkes et al., 2016; Mills-Koonce et al., 2007). According to Dix (1991), emotions are organized and regulated in a way that supports parents' ability to meet the needs of children. Specifically, he argued that negative parental emotions undermine effective caregiving as it can cause parents to focus on their own behavior and goals instead of their child's needs (Dix, 1991). When unable to meet the child's needs, there can be negative outcomes for the adjustment and survival of the child. For example, earlier research by Frodi and Lamb (1980) demonstrated that crying is an aversive child stimuli to parents which can trigger aggression and lead to a higher likelihood of abuse and neglect.

Taken together, it is important to understand the processes underlying mothers' responding to infant signals. A key way in which parents' responding has been examined is to monitor their autonomic physiological and brain responding to infant signals because these parameters of responding reflect emotional processes integral to parenting behavior. Research has demonstrated a variation in responding, such as a heightened response to infant distress as compared to other infant vocalizations (e.g. laughter; Groh & Roisman, 2009; Leerkes et al., 2016; Mills-Koonce et al., 2007). Specifically, in response to infant crying, individuals exhibit increases in heart rate, cortisol, skin conductance, and blood pressure (Lin et al., 2002;
Mills-Koonce et al., 2009; Frodi et al., 1978). In light of such evidence, it is important to understand ways in which mothers' responding to infant crying might be supported.

Role of Partner Presence

According to attachment theory, interpersonal relationships provide the social context in which individuals regulate emotions. Specifically, infants are born without the capacity to regulate their emotions and thus, are reliant on parents to support emotion regulation (Bowlby, 1982). Within secure attachment relationships, infants effectively use caregivers to seek support from parents that is effective in relieving distress and resolving problems (Bowlby, 1982). In turn, this relationship serves as a prototype for subsequent relationships (Roisman et al., 2005). Thus, throughout the life course, individuals are expected to seek out relationship partners beyond parents, including romantic partners, as a source of emotional regulation.

It is also suggested by the Social Baseline Theory by Coan (2008) that social proximity and interaction between social partners may support emotional regulation of neural response during emotional challenges. It is argued that close proximity of social partners allows for simple risk distribution during threatening situations. In addition, attachment figures are thought to help relieve one's allostatic load, engaging in more effective physiological and emotional regulation (e.g. "load-sharing"; Coan, 2008). To study such a phenomenon, Coan and his colleagues (2006) conducted a study in which women were electrically shocked while their brain activation was

monitored via functional magnetic resonance imaging (fMRI) under three conditions: a) alone, b) holding a stranger's hand and c) holding their spouse's hand. Results showed that both the presence of the spouse and stranger reduced women's neural threat response to some degree but neural activation was significantly lower in the spouse condition than in the stranger condition. Moreover, partner presence was found to be particularly beneficial for women who reported being satisfied in their relationship with their romantic partner (Coan, Schaefer & Davidson, 2006).
Extended research further exemplifies the social regulation of emotion, also referred to as coregulation or synchrony. Butler and Randall (2013) define coregulation, stating it as a bidirectional linkage of oscillating channels within optimal bounds, allowing partners to regulate through close proximity. Several studies have provided evidence of co-regulation in adult romantic relationships. For example, partners' emotional affect has been found to covary on a day-to-day basis, and the association was stronger the more time the couple spent together (Butner et al., 2007). Similar findings were found in another study where participants' RSA was associated with their partner's previous RSA, and the association was examined to be stronger within couples with reported high relationship satisfaction (Helm, Sbarra & Ferrer, 2014). In light of theories regarding the role of close interpersonal relationships in supporting individuals' emotional responding and supporting evidence, we expected that the presence of mothers' romantic partner would support their capacity to self-regulate when confronted with infant attachment signals.

Brain Response

Infant distress has been reported to elicit neurological responses in addition to autonomic physiological responses. Electroencephalogram (EEG) can be used to assess brain response to such infant cues. Research has demonstrated that monitoring brain activity over the frontal cortex, called frontal EEG asymmetry, can support feedback on parental behavior and emotional regulation (Coan & Allen, 2004).

Frontal EEG Asymmetry and Emotion Capability

Coan, Allen, and McKnight (2006) proposed the capability model of frontal EEG asymmetry, suggesting that meaningful individual differences in frontal EEG asymmetry exist and are best described as interactions between emotional demands of specific situations and emotion-regulatory abilities. This model is differentiated from previous affective models that focused on examining EEG asymmetry at "rest" tasks in relation to traits-like emotions variation (e.g., personality, temperament). Within the capability model of frontal EEG asymmetry, relatively greater right frontal activity indicates withdrawal-oriented emotional states (disgust, fear, sadness) and relatively greater left frontal activity indicates approach-oriented emotional states (anger or joy; Coan, Allen & McKnight, 2006). It was concluded from their results that individual differences in response to emotional situations were more stable than resting-state EEG asymmetry and that shifts in asymmetry index individuals' capacity to engage and respond to emotions. The capability model is a useful framework for examining mothers' neural responding to infant distress cues. For example, a study was conducted to examine links between mothers' brain activity and reported emotional responding to infant distress (Killeen & Teti, 2012). EEG data was recorded as mothers watched a video of their infant's displaying expressions of joy, anger/distress, and neutral states. Results of the study revealed maternal affective/motivational responding (frontal EEG asymmetry) shifted toward greater relative right frontal activation from rest to infant anger/distress. Moreover, mothers who exhibited smaller relative right shifts in frontal EEG asymmetry reported feeling less worried when watching the infant anger/distress video (Killeen & Teti, 2012). This finding converges with Coan, Allen, and McKnight's, showing that this shift in mother affective/motivational responding reflected the emotional capacity of mothers during specific emotional challenging situations, such as infant distress.

Moderators

Maternal Attachment Representations

Previous research suggests that higher security in attachment representations reflect better emotional regulation and better sensitivity to infant distress. Lower levels of secure base knowledge are associated with heightened levels of skin conductance from the baseline to the crying condition (Groh & Roisman, 2009). Similarly, highly aroused skin conductance levels and well-regulated mothers were attentive to infants' needs and less on their own–predicting sensitive responses during distressing tasks (Leerkes et al., 2016). In addition to autonomic physiological findings, lower levels of secure base knowledge are associated with smaller shifts in right EEG activation during crying condition (Groh et al., 2015). Evidence suggests that mothers do respond to infant distress vocalizations and those higher (vs. lower) on the secure base knowledge were able to better maintain, or regulate, their physiological responding to infant distress.

Maternal Anxiety and Depression

Past research has revealed that internalizing psychological factors, such as anxiety and depression, affect physiological and brain response during times of emotional challenge.

Specifically, mothers with depression have been reported to be less attuned to their child's needs (Granat et al., 2017; Jameson et al., 1997; Laurent & Ablow, 2012). For example, one study examined depression-related differences in first time mothers' neural response to infant distress (Laurent & Ablow, 2012). Both mothers diagnosed with depression and the comparison group (no psychopathology reported) were exposed to audio of their own infant's cry, an unfamiliar infant's cry and a control sound while under MRI scanning. The study revealed that mothers with depression did not show a significant response to infant distress vocalization, compared to non-depressed or lower rated depressed mothers who are seen to have significant neural response on some level (Laurent & Ablow, 2012). This disturbance in brain activity is thought to diminish responsiveness to emotion stimuli, affecting parenting behaviors and coping.

Current Study

The goal of this study is to better understand how to support mothers during times of infant distress, which also reflects implications for child outcomes. Past studies have investigated many aspects of maternal response to such emotional stimuli. However, little is known about the effect of partner presence during infant distress. Following attachment and social baseline theory, we expect that mother's emotional engagement during infant distress will be supported by partner presence. In line with the previous findings, we hypothesized that (a) partner presence will support mothers' emotional engagement with infant distress, reflected by greater shifts in frontal EEG asymmetry, (b) due to higher quality in attachment representations, there will be greater relative right shifts in frontal EEG asymmetry in the together condition (v. separate) and (c) due to higher reported depression, there will be a weakened relationship between partner presence and maternal emotional engagement, seen by lesser shifts in frontal EEG asymmetry regardless of condition.

Method

Participants

The sample comprised 60 mothers (M = 31.00 years; *SD* = 4.67) of 6-month-old infants (*M* = 6.27 months, *SD* = 0.52; 51% female). For half of the mothers, their romantic partner joined them in the lab for the experimental portion of the study. Mothers were recruited via advertisements in local childcare centers and community centers and through advertisements in university newsletters to faculty and staff. Seventy-eight percent of mothers were Caucasian, 9% were Asian, 6% were Hispanic, 4% were African American, and 3% of mothers were from other racial backgrounds (i.e., Native American, multiracial). Mothers' education ranged from high school degree (1) to advanced degree (5) with a median of 4 (bachelor's degree). Seventy-eight percent of fathers were Caucasian, 8% were Asian, 7% were Hispanic, 5% were African American, and 2% of fathers were from other racial backgrounds (i.e., Native American, multiracial). Fathers' education ranged from high school degree (1) to advanced degree (5) with a median of 4 (bachelor's degree). Annual family income ranged from less than $10,000 to more than $100, 000 with a median reported range between $60,000 and $70,000.

Procedure

Mothers were administered the Adult Self-Report (Achenbach & Rescorla, 2003) to assess their depressive symptoms. In addition, mothers completed the Attachment Script Assessment (Waters & Rodrigues-Doolabh, 2004) while being digitally recorded for later transcription and coding. Next, physiological sensors measuring brain activity (EEG) and eye movement (EOG) were attached to the mothers. Half of the mothers ($n = 30$) then completed the resting baseline and infant vocalization procedures while their romantic partner was present and holding their hand. The other half of mothers ($n = 30$) completed the resting baseline and infant vocalization procedures without their romantic partner present. For the resting baseline procedure, mothers were asked to rest completely, clearing their mind of all feelings, thoughts, and emotions, for a total of 4 minutes. According to standard practice of acquiring spectral EEG baseline (Towers & Allen, 2009), the 4-min baseline was broken into eight 30-s blocks in which the mothers were asked to have their eyes either open and focused on a cross in front of them or closed (order counterbalanced). Next, mothers were told they would hear a recording of an infant delivered through headphones and that they should close their eyes, listen carefully to the infant, and try to think of how they would respond if the infant were their own child. Mothers listened to an audio recording of an infant crying for 2 min (peak amplitude of each cry averaged 89.51 decibels, *SD* = 1.85; Groh & Roisman, 2009).

Measures

Attachment Script Assessment (ASA)

At the start of the ASA (Waters & Rodrigues-Doolabh, 2004), mothers were given six cards, each with the title of a story and a list of 12 words (organized in three columns). They were asked to tell all six stories (order counterbalanced), three of which concerned children's relationships ("Baby's Morning," "Doctor's Office," and "Trip to Park") and three of which concerned adults' relationships ("Jane and Bob's Camping Trip," "The Accident," and "An Afternoon Shopping"). The two adult stories ("Jane and Bob's Camping Trip" and "The Accident") and two child stories ("Baby's Morning" and "Doctor's Office") designed to tap SBSK were coded. Stories were rated for SBSK using the 7-point scale designed by Waters and Rodrigues-Doolabh (2004). A secure base script is one in which a problem occurs and there is a bid for help, help is offered and useful in overcoming the situation, and the situation returns to normal. Narratives that receive the highest score (7) clearly show this structure, whereas narratives that receive the lowest score (1) lack a clear secure base structure. Importantly, SBSK in the ASA and coherence in the AAI are moderately correlated and share common origins in the caregiving environment (Schoenmaker et al., 2015; Steele et al., 2014; Waters & Waters, 2006). A composite score reflecting SBSK ($M = 3.92$, $SD = 0.89$) was created by averaging scores across narratives, and this composite score was used in all analyses ($\alpha = 0.70$). The ASA narratives were evaluated by trained coders who overlapped on 20% of the stories for reliability purposes. Interrater reliability was high ($ICC = 0.92$, range = 0.86- 0.95). SBSK was standardized for all analyses.

Adult Self-Report (ASR) DSM-Oriented Scales

The ASR DSM-oriented scales were used to measure mothers' psychological symptoms (Achenbach & Rescorla, 2003). The internalizing symptoms scale was used in this study. Mothers rated items on a 3-point scale: not true (0), somewhat or sometimes true (1), and very true or often true (2). Total scores for each scale were converted to *T*-scores using the manual for the Achenbach System of Empirically Based Assessment (ASEBA) Adult Forms & Profiles (Achenbach & Rescorla, 2003).

Frontal EEG Asymmetry

Continuous electroencephalographic (EEG) activity was recorded using an ActiveTwo head cap and the ActiveTwo BioSemi system (BioSemi, Amsterdam, The Netherlands). Recordings were taken from 32 scalp electrodes arranged according to the 10-20 system and 2 electrodes placed on the left and right mastoids. Electrodes were placed below the right and left eyes and near the outer canthus of each eye for recording vertical and horizontal electrooculograms. As per BioSemi's design, the ground electrode during acquisition was formed by the Common Mode Sense active electrode and the Driven Right Leg passive electrode. All bioelectric signals were digitized on a laboratory computer using ActiView software (BioSemi). Sampling was at 512 Hz. Off-line analysis was performed using ElectroMagnetic Source Estimation Suite Data Editor software (Version 6.4; Source Signal Imaging, San Diego, CA).

EEG data were re-referenced to the numeric mean of the mastoids (M1, M2) and band-pass filtered, with cutoffs of 0.1 and 30.0 Hz. An algorithm was implemented using ElectroMagnetic Source Estimation software to remove blinks from the EEG. Gross movement, eye blink, and other artifacts were removed manually. If artifact appeared in one channel, data from all channels were removed. However, if an artifact appeared in one channel throughout the entire condition, all data from that channel was removed so as not to lose data from the other channels. A fast Fourier transform, using a Hamming window, transformed data to power spectra, and the average power spectrum for each condition (rest or infant crying) was obtained. Total power within the alpha frequency band (8–13 Hz) expressed in microvolts squared was extracted for each condition. To normalize the distribution of alpha power prior to statistical analyses, raw alpha power from each electrode site (at the F3 and F4 sites) during the resting period and while listening to infant crying was natural logarithm transformed.

Results

Descriptive data for all relevant variables are shown in Table 1. Alpha power was larger at the right versus left electrode (F3 $\mu = 8.53$, F4 $\mu = 8.80$), reflecting greater relative left frontal EEG asymmetry. Alpha power during cry was larger at the right versus the left electrode (F3 $\mu = 9.86$, F4 $\mu = 11.36$), reflecting greater relative left frontal EEG asymmetry. Secure base script knowledge had a wide range of scores on a scale from 1-7, with a minimum of 1.22 and maximum of 6.58 (SD = 1.16). On a scale from 0-90, anxiety and depression scores were limited with a minimum score of 50 and maximum score of 83 (SD = 7.34)

We conducted a regression analysis predicting mothers'

frontal EEG asymmetry to infant crying as a function of their frontal EEG asymmetry at rest, condition (separate v. together), secure base script knowledge, the interaction between condition and secure base script knowledge (see Table 2). Further analyses investigated internalizing psychopathology (anxiety, depression), and the interaction between condition and internalizing psychopathology (anxiety, depression) using the same model (see Table 5). Results revealed there was a significant positive association between resting baseline and mothers' frontal EEG asymmetry ($B = 0.84$, $p < .05$).

Unexpectedly, there was no significant association between condition (separate v. together) and mothers' frontal EEG asymmetry during infant crying ($B = 0.00$, $p = .49$). Findings revealed that although partner presence was not significantly associated with mothers' frontal EEG asymmetry to infant crying, condition and mothers' secure base script knowledge interacted to predict mothers' frontal EEG asymmetry to infant crying ($B = 0.02$, $p < .05$). Furthermore, we did not find a significant association between internalizing psychology and mothers' frontal EEG asymmetry to infant crying (anxiety and depression; $B = 0.00$, $p = .34$) and no significant interaction between condition and internalizing psychopathology was found to predict mothers' frontal EEG asymmetry to infant crying (anxiety and depression; $B = 0.00$, $p = .44$).

Follow up analyses examined the association between mothers' attachment and frontal EEG asymmetry to infant crying in the separate and together condition as seen in Table 3 and Table 4. In the separate condition, results revealed that mothers' secure base script knowledge was associated with greater relative right frontal EEG activation to infant crying ($B = -0.03$, $p < .05$, see Table 3). In the together condition, findings show that mothers secure base script knowledge was not associated with frontal EEG asymmetry to infant crying ($B = 0.01$, $p = .13$; see Table 4).

Discussion

Mothers' neural responding has been thought to support their capacity to effectively respond to infant needs (Groh & Roisman, 2009; Leerkes et al., 2016; Mills-Koonce et al., 2007). When confronted with infant crying, evidence indicates that mothers' who engage in more sensitive caregiving behaviors (e.g. worry, empathy) reflect a greater relative right shift in brain activation (Killeen & Teti, 2012). Moreover, it is also thought that mothers' variation in secure base script knowledge (e.g. attachment) is also tied to the capacity in which mothers can emotionally engage in infant distress (Groh et al., 2015). In the current study, given the significance in which close interpersonal relationships support individuals' emotional responding, we were focused on the role of partner presence in mothers' neural activation during infant crying (Coan, 2008; Coan, Schaefer & Davidson, 2006; Helm, Sbarra & Ferrer, 2014). We found no evidence of a significant association between condition (together v. separate) and mothers' frontal EEG asymmetry to infant crying, although we did find evidence of a significant association between condition (together v. separate) and mothers' secure base script knowledge.

Evidence that partner presence was not associated with mothers' frontal EEG asymmetry to infant crying was unexpected, and suggests that partner presence alone does not modulate mothers' neural responding to infant crying. Instead, findings revealed that partner presence and mothers' attachment representations interacted in predicting their frontal EEG asymmetry to infant crying, suggesting that mothers' frontal EEG asymmetry to infant crying is jointly influenced by both partner presence and their attachment representations. The individual differences in mothers' secure base script knowledge was only significant in predicting mothers' brain activation in the alone condition, while in the together condition, we no longer observe this effect. These findings highlight the importance of examining mothers' responding to infant cues not only as a function of their attachment representations, but also in the context of their broader relationships, and suggest that findings from prior work in which parents are alone may not generalize to contexts in which romantic partners are present.

More specifically, findings from this study revealed that the association between mothers' attachment and frontal EEG asymmetry to infant crying differed by whether mothers' romantic partner was present or absent. When alone, mothers with higher secure base script knowledge (i.e., greater security) exhibited greater relative right frontal EEG activation. This finding replicated prior research in which mothers' with higher levels of secure base knowledge were found to exhibit larger shifts toward relative right EEG activation when listening to infant crying (Groh et al., 2015). Given that greater relative right EEG activation in response to infant distress has been linked with greater worry, empathy, and more sensitive caregiving (Killeen & Teti, 2012) this evidence suggests that mothers' attachment security is tied to neural responding reflective of an affectively

attuned response to infant distress that might support their caregiving behavior.

This study also provided new evidence that when a romantic partner was present, attachment was no longer associated with mothers' frontal EEG asymmetry to infant crying. This evidence suggests that partner presence may be acting as a buffer to the negative impact of lower secure base script knowledge on mothers' neural responding to infant crying. Such evidence is in line with attachment and social baseline theory regarding the supportive role of social partners in reducing perceived threat and supporting emotion regulation. Moreover, this evidence extends prior research indicating that partner presence reduces women's amygdala activation in response to potential threat (e.g., risk of electric shock; Coan, Schaefer & Davidson, 2006). In addition to highlighting the need for further research examining mothers' responding to infant distress within their broader network of social relationships, findings from this research suggest that insecure mothers might particularly benefit from the supportive presence of partners when confronted with caregiving challenges.

The current study found no evidence that anxiety and depression was significantly associated with mothers' frontal EEG asymmetry when listening to infant crying. Further analyses found no main effects in the interaction between condition and anxiety and depression predicting mothers' frontal EEG asymmetry when listening to infant crying. Past evidence has indicated that mothers with depression have a dampened neural response to infant distress compared to mothers with lower scores or no reported scores of depression (Granat et al., 2017; Jameson et al., 1997; Laurent & Ablow, 2012). However, it may be important to note that the ASR DSM-oriented internalizing symptoms scale has a range of 0-90, and our sample reported scores of anxiety and depression ranging from only 50 to 83. Given the limited range, it may be that a sample of mothers with a greater range of reported anxiety and depression scores are needed to see any significant effects on mothers' frontal brain activation when listening to infant crying.

Limitations

This study had the goal of examining the role of partner presence in mothers' neural responding to infant crying. While our findings provide support that partners may have a significant role in predicting mothers' brain activation to infant crying, our study comprised of a sample that is not generalizable to the greater public. We conducted the study with 60 mothers and 30 fathers, both of whom were primarily White and well-educated. Mothers also comprised a limited range in reported internalizing psychopathology. It would be a strong suggestion for future replications to increase size and diversity across all parameters in the sample population. In addition, we conducted the study using a between-subject design, given the previous collection of data in an ongoing longitudinal study. It may be of interest to also examine the role of partner presence in mothers' brain activity during infant crying using a within-subject design to compare conditions using the same group of participants. Moreover, our findings suggest that mothers' frontal EEG asymmetry is influenced by both mothers' attachment and the presence of their romantic partner when listening to infant crying. However, while we were able to assess mothers' attachment representation by the use of the Attachment Script Assessment, it may be important to further investigate the quality of the relationship between mothers and their romantic partners, such as the duration and satisfaction of the relationships. This would allow for a deeper understanding of the significance of partner presence when examining parental response to infant cues.

Conclusion

In the current study, we found that mothers' frontal brain activation was influenced by an interaction occurring between partner presence and mothers' attachment representations when listening to infant crying. Mothers with a higher secure base script knowledge (i.e., greater security) exhibited greater relative right frontal EEG activation in the separate condition while mothers showed no significant response in the together condition, indicating that parenting behavior may differ when alone versus in the presence of the romantic partner when confronted with infant distress. Our findings coupled with evidence that romantic partners support one another in times of challenge, emphasize the importance to further investigate parents' responding to infant cues in the context of their broader relationships.

Table 1

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Alpha Power During Baseline					
F3 Electrode Site	60	1.61	29.1	8.53	5.66
F4 Electrode Site	60	1.41	27.51	8.80	5.55
Alpha Power During Cry					
F3 Electrode Site	60	1.51	34	9.86	7.37
F4 Electrode Site	60	1.45	35.4	11.36	8.42
Frontal EEG Asymmetry					
Baseline	60	-0.74	0.53	0.03	0.15
Cry	60	-0.58	0.61	0.13	0.14
Predictors					
SBSK	60	1.33	6.58	3.98	1.16
Anxiety and Depression Scores	60	50	83	56.17	7.34

Table 2

Regression Analysis Predicting Mothers' Frontal EEG Asymmetry During Infant Crying

	B	*SE*	*p*
EEG Asymmetry at Rest	.84	.06	<.05
Condition (Separate v. Together)	.00	.01	.49
SBSK	-.01	.01	.29
Condition × SBSK	.02	.01	<.05

Table 3

Regression Analysis Predicting Mothers' Frontal EEG Asymmetry During Infant Crying in the Separate Condition

	B	*SE*	*p*
EEG Asymmetry at Rest	.90	.07	<.05
SBSK	-.03	.02	<.05

Note. SBSK, Secure Base Script Knowledge

Table 5

Regression Analysis Predicting Mothers' Frontal EEG Asymmetry During Infant Crying Using Mothers' Reported Anxiety and Depression Scores

	B	*SE*	*p*
EEG Asymmetry at Rest	.81	.06	<.05
Condition (Separate v. Together)	.00	.01	.39
Anxiety and Depression	.00	.01	.34
Condition × Anxiety and Depression	.00	.01	.44

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Integrating social equity with sustainable development: Perspectives from design practitioners

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As design and architecture advances in efforts towards sustainable development, underserved communities are still at a disadvantage in regard to environmental sustainability as it pertains to sustainable design. The perspectives from this study give insight on how design practitioners can advance social equity in practice. This paper offers a look at sustainable design through the lens of the theoretical framework known as the triple bottom line or the 3 E's of sustainability: economy, environment, and social (equity). This involves looking at how far professionals have come since the Brundtland Commission and how it impacts the target population. This approach offers an overview of each concept within the framework to identify how each one works, similarities and goals. This qualitative study utilized a snowball sampling technique to engage design professionals (n=7) in in-depth interviews about their experiences integrating these concepts. The analysis illustrates the top findings involve the need for a design framework focused on the need for inclusivity and strategies to design around human social networks. This means understanding that a sustainable environment includes sustaining the people within the community, and using the learned experiences as guidance for better and more effective design strategies that implement those needs.

Focusing on addressing biases so professionals can shift their design approach to effectively move towards the opportunities that lie within this work. This research aims to emphasize the importance of using both the social equity and environmental sustainability concepts together rather than individually to advance further in sustainable design.

Introduction

In recent years, as the field of interior design and architecture diversifies, and professionals become increasingly aware of inequities in our built environments, there is an increasing focus on design with and for underserved communities (Mancebo 2015). The need for these communities is greatly affected by architecture and urban development's approach to the issue. Climate change continues to

greatly affect our world and it has an increased negative effect on disadvantaged groups (Islam & Winkel, 2017). With these communities in mind, there is a greater need for attention to address their health and well-being with honest discussions about what is lacking. The overall guiding question of this study is: what challenges and opportunities do built environment professionals face when integrating social equity and environmental sustainability in affordable, urban housing projects? The objective of this research is to identify opportunities and barriers that can help practitioners connect these concepts with their practice in sustainable development.

Literature Review

The key to discussing this broad topic is addressing the contradictory meanings behind sustainable development. The idea is to promote development that meets current needs, within reach of earth's finite nature, without compromising future generations (Mancebo 2015). The conflict with this idea is that professionals can overlook whose needs will be met with these efforts. Mancebo reflects back to the 1987 mission statement of the World Commission on Environment and Development, also known as the Brundtland Commision, (WCED 1987) that explicitly reads, "its objectives were how to reduce inequality and poverty without damaging the environment granted to the future generations" (Mancebo 2015). While this is a difficult task to achieve, one can't help but think why aren't these efforts being directed more towards this population, if that was the original objective?

Focusing on the gap between equity and the environment, this idea of sustainable development is crucial specifically concerning urban environments (Mancebo 2015). This research examines these concepts through the focus of what is known as the three fundamentals (i.e. the triple bottom line) of sustainability: environment, economy, and social (equity) (Figure 1).

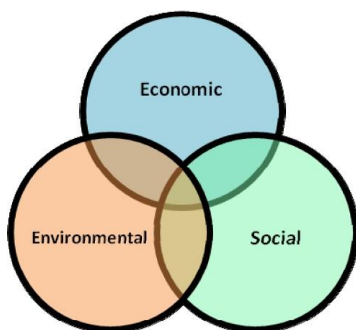

Figure 1. Interlocking circles model of Sustainability (Barron and Gauntlett, 2002)

The environmental aspect addresses the responsibility to preserve natural resources and protect the existing ecosystem. The economic perspective concerns supporting economic growth through profit, savings, and development. Lastly, the social sphere

involves the needs of the social environment, including equity within the community (Ayalp 2013). Bramley et al. (2006) referenced this topic in regard to social sustainability stating social equity issues are identified as "sustainability of community" (Mak & Peacock, 2011). This includes social inclusion providing access to employment, education, health, housing, and everything in between to create a supportive community for all (Tavakoli et al., 2018). In the urban setting, this means considering the needs and rights of the occupants in order to improve quality of life. In order to address the social aspect of sustainability, issues such as: social inequality, accessibility, and preservation of the existing culture are key to success (Mak & Peacock, 2011).

Urban regeneration is another portion of the discussion concerning urban development. This is important to note as the idea, stated by Peter Roberts (Roberts, 2000) and reworked for the purposes of this research, is to resolve urban problems by bringing long-term improvement in all economic, social, and environmental conditions within the area (Colantonio 2009). This idea is important concerning regenerative design, the idea of merging human, building, and nature (Dias, 2015), because it emphasizes the goal to restore the natural environment and improve the existing built environment. With research, designers have progressed towards simultaneously improving economic growth and environmental protection when working on sustainable development. The concern now is to increase work toward social equity in addition to the other pillars. The environmental health of a community is heavily affected by social justice and equity concerns. This idea of a just and sustainable future would give that push forward to build sustainable communities for all people (Opp & Saunders, 2013). This requires a change within the standard way of designing, which involves a paradigm shift. Design professionals and developers need to transition into a different way of thinking in order to find a different approach for integration (Wheeler, 2016). This involves communicating with and visiting these neighborhoods in order to ask the necessary questions:

- What does this transition look like in the built environment?
- What can be done differently to achieve equity and benefit the existing community?

- What assessments are used to see if efforts were a success in order to improve?

The Integrated Design Process

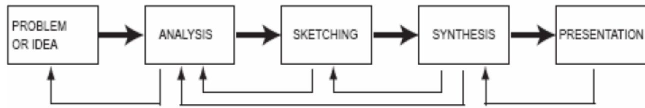

Figure 2. The phases of the Integrated Design Process (Hansen & Knudstrup, 2005)

An approach that has been discussed regarding sustainable architecture is represented in the Integrated Design Process (IDP). IDP is a method created to allow for intervention in early stages of the design process to avoid complications earlier on (Larsson, 2009). This is a method that provides not only the engineers with a more collaborative role in the beginning stages but also the client with a more active role as well. It starts with thorough observation of the problem and analysis of the neighborhood, weather, and surrounding architecture (Hansen & Knudstrup, 2005). The phases noted above (Figure 2) involve a deeper dive in actual design decisions, including the building's form, that provide the best sustainable solution for the design problem. The idea with this approach is that if mechanical, structural, and electrical engineers and other specialized consultants specific to the project are integrated in the early stages, then the result can be a highly efficient and sustainable design (Larsson, 2009). Although this may be a challenge, according to Larsson, it is a well-proven observation that could change the perspective of more inclusive sustainable design. This method of including specialists for specific projects could help eliminate and solve issues down the line with more collaborative roles.

The challenges in achieving this kind of design are important to understand but they shouldn't hinder the opportunities for success. Conroy (2006) states that specializations addressing environment and land use, housing, economic development, and transportation elements of urban and regional planning are able to promote all three of the fundamental goals of sustainability (p.19). This statement is important to acknowledge because there is a difficulty in practice with using the pillars together to strengthen the concept of sustainability. In order to strengthen this concept, a push for a different approach that can shift perspective could allow for more advocacy and success stories that can be perceived in a better light.

Case Studies and Green Building Programs

Patel and Padhya (2021) examined a case study that incorporates sustainable and passive design strategies, within affordable housing limits, a medium-rise rental housing development. Passive design consists of strategies that improve a building's energy consumption by designing the building form in response to the surrounding natural environment (Aksamija, 2015). It includes strategies using natural ventilation, cross ventilation, rainwater harvesting, and natural lighting in individual units (Patel & Padhya, 2021). Small design decisions such as removable sunscreens for both privacy and ventilation have been considered and make a notable difference. Another example of professionals tackling this concept is shown with the Edwin M Lee Apartments (Figure

3), winning the 2022 COTE Top Ten Award. It is a combined multi-family development housing homeless veterans and low-income families located in San Francisco. Some notable features, mentioned through the American Institute of Architects, (AIA, n.d), include a rainscreen facade, solar canopy facing the south (the direction of the sun), and a communal courtyard for the occupants. Even the consideration of building single family detached sustainable housing (Patel & Padhya, 2021) that is within walking distance to public transportation, schools, and shopping centers, improves the community while still allowing equal access. This accessibility is important to advocate for within the standards of design.

Figure 3: Edwin M Lee Apartments; front facade (left) and courtyard (right) (AIA, n.d)

Although there are green building rating systems that push design innovation, the U.S Green Building Council being dominant (USGBC, 2019), the standards mainly address the environmental sphere and not so much the social equity sphere. The International Living Future Institute does well at illustrating strategies that integrate the concept behind regenerative design through the Living Building Challenge (LBC). This challenge does well by including a separate pillar or equity petal that addresses the social equity bubble of design (Living Building Challenge, 2019). This petal relates back to

Colantonio's emerging themes regarding the social dimension:

- social mixing and cohesion
- identity, sense of place and culture
- health and safety
- participation, empowerment and access
- well-being, happiness and quality of life

These practices are important to note because they arguably have little regard in respect to environmental sustainability. The three fundamentals of sustainability are usually thought of as separate approaches when researched or practiced by professionals. As a result, there is an abundance in studies and action when considering the economic and environmental perspective; while the social aspect can be "oversimplified and under-theorised" (Colantonio, 2009). To overcome this issue as designers, there must be a consideration of standards concerning both populations of poverty and wealth. The LBC (Living Building Challenge, 2019) and Social Economic Environmental Design network (SEED, n.d.) are the first of very few approaches towards integrating standards that advocate for social equality, yet they are not the dominant approach. To set a more dominant standard means to establish a definition of "the need" regarding underserved populations (Ayalp, 2013).

Methods

This study employs methods of qualitative social science to explore the perceptions and lived experiences of design professionals who are actively working to address social equity in their design projects. Given this focus on patterns across individual experiences, a phenomenological approach was chosen as the lens for data collection and analysis (Creswell, 2014). The data collection process consisted of interviews of design professionals (n=7) who are integrating these concepts in the built environment. The criteria for selection in this study was participants who have experience in the fields of sustainable development, affordable housing, and urban design. This can include a variety of design professionals across interior design, architecture, and urban planning/design. A snowball sampling technique (Handcock & Gile, 2011) was used to recruit professionals to participate. At the end of each interview, key informants were asked to suggest other professionals who would have a useful perspective for this study. Each interview was semi-structured with questions focused on their individual roles and experience centered around the triple bottom line framework. With the permission of each participant, each interview was audio recorded. Due to geographical limitations, 6 of the interviews were conducted via zoom with one arranged in-person interview. The data collection process consisted of 7 interviews total lasting between 40-83 minutes.

The audio recordings were transcribed and imported into Dedoose, an application used for analyzing qualitative research, for thorough coding and identifying important themes. To protect privacy in reporting, each key informant was given a pseudonym (Table 1 lists the participants' role and experience). The data analysis includes continuous reading of each transcript and coding sentences or paragraphs with developing themes and unique quotes. The second phase of coding employed the equity, environment, and/or economy framework where emergent codes were examined for fit with the framework and themes were continuously developed. All notes and memos will be reviewed alongside each transcript and code to triangulate emerging results. Each interview yielded important information regarding obstacles and opportunities that professionals face when integrating these key themes, and analysis will feature a content analysis of responses to these questions to examine patterns across respondents.

Table 1. Study Participants

Pseudonym	Role	Experience	Years of Experience
Brook	Project Manager	Affordable Housing	6 yrs
Carter	President	Architecture, Affordable Housing	24 yrs
Jessica	Instructor	Environmental Issues, Urbanism	10 yrs
Julia	Project Manager	Architecture, Affordable Housing	12 yrs
Mark	Chief Visionary Officer	Permanent Supportive Housing	8 yrs
Sadie	Interior Designer	Interior Design, Affordable Housing	10 yrs
Kassidy	Instructor	Architecture, Affordable Housing	22 yrs

Findings

The original question sought to understand the challenges and opportunities that designers face when integrating the theoretical framework in practice. Research showed that there is a higher concern towards the challenges of this process. The challenges discussed were identified through emergent themes from each

interview. The themes were organized in a manner focusing on the codes that fit within the 3 E's framework (Figure 4) in order to display pertinence to the original question.

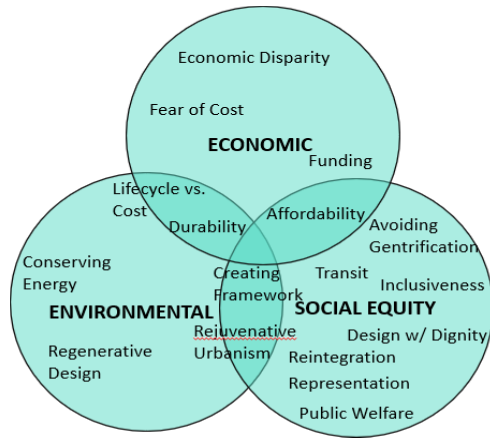

Figure 4. Triple Bottom Line Framework with Codes from Data Analysis

Majority of participants mentioned that part of the reason there is a difficulty in practicing using these pillars together is because there is a need for a stronger focus on social equity. The top findings revolve around creating a framework that allows for inclusive opportunity and settling on an approach that designs around human social needs. Each theme displayed is further defined in Table 2 as the perceived challenges. The codes referenced do not fully elaborate on sustainable design due to the prominent barriers surrounding the inclusion of social equity.

Table 2. Prominent Challenges Perceived by Professionals

Economic Disparity	Concerns the lack of opportunity and rental rate not being inclusive of all those in the community
Fear of Cost	Opting out of helpful and inclusive design features due to fear of expenses
Funding	Ample amount or lack of investment in projects in underserved communities
Lifecycle vs. Cost	Challenge of creating designs that will sustain through the years or save as much money as possible
Durability	Acknowledgement that a durable design outweighs a sustainable design
Conserving Energy	Challenge of designing to save as much energy as is produced
Regenerative Design	Lack of understanding the design approach that works with the surrounding natural environment
Rejuvenative Urbanism	Lack of understanding the design approach to designing around the concept of human and social network
Creating Framework	Creating a design framework that has a sharper focus on social equity elements
Affordability	Solutions and challenges through design choices to make housing affordable
Design w/ Dignity	The need to incorporate specific design features that provide dignity through function AND quality
Avoiding Gentrification	Avoiding displacement of current community members for wealthier people due to housing improvements
Inclusiveness	The challenge of including the end user throughout the design process
Transit	The need to design places that include or consider means transportation, especially public transportation
Reintegration	The need to acknowledge the process of reintegrating someone back into society
Representation	Importance of expanding the industries employee representation of all races, cultures, and backgrounds
Public Welfare	Reframing policies and mindsets to design around public welfare

Closing in on the last phase of analysis, the following information narrows in on the key takeaways from the information given from professionals.

The Call for a Change in Perspective

Built environment professionals mentioned that what's needed is a change of perspective surrounding this kind of work by addressing stigmatisms that lie within the industry and society. A topic that often came up was that you can't exclude the community you are designing for throughout the design process and expect an inclusive design as the end result. The actions to change this depend on the perceptions that frame the idea of what should be done but these perceptions need to be informed by the right source. For example, Kassidy, an instructor and architect who focuses on affordable housing, discusses the narrative surrounding the need for an extra layer of security when building supportive and affordable housing units. She says that "you need to have them secure in there, you're not so much protecting the neighbors as you are the people within the fence." The discussion we had right before this statement was how common it is for society to have this "not in my backyard" mindset when it comes to this line of work and what would make them feel safer is security from the target populations. The perspective that is addressed here is that the design should target the end user and end goal above all else because they are the need. When considering that need, designers should find ways to understand their stories in order to provide an effective design that they can connect with. Mark, another study participant who is the chief visionary officer for his company, stated that "Our general perceptions of homelessness are informed by somebody walking down the street or somebody holding a sign, but not informed by I met this person, I know their name, I know their story." Sadie, an interior designer, mentioned a solution for moving past the biased perceptions which involves "taking the time to figure out who you're designing for and not just assuming that you know the answer." To

close this gap between professionals and the target user means to connect with the community you are designing for by holding meetings and outreach events to not only hear their story but involve them in the process. This allows for proper representation and is a start to the design reintegrating them back into society.

A Focus on the "Sustainability of Community"

Another step needed to integrate equity into the concept of sustainable development is to understand that sustainable design includes the sustainability of the community. This means designing in a way that represents the existing culture and designing around the need to network and enjoy the natural environment. The challenge with representing the existing culture is that it can be overlooked and often cause gentrification. Jessica, a design instructor focused on urbanism and environmental issues, says the designers job is "to make sure that as we're building all these expensive communities, we are still providings opportunity for other people to be able to afford housing as well." Brook, a project manager for a company focused on affordable housing also talks about gentrification stating, "[I] think we have to help protect communities from developers that just come in and put developments and cause displacement." She then went on to say how it is the company and design teams job to advocate for these communities by educating themselves, society, and the developers on the community needs. Carter says "if its not serving the need, you know, if its not doing the right kind of work, you know, its, its a wasted building." He later states that "our cities are designing around the concept of mobility not on around the concept of network." Sustainability of community also addresses other aspects surrounding social network including social inclusion, transit, and public welfare. Professionals interviewed accommodate this in practice by designing housing that have dignified common spaces allowing for interaction, adding cultural touches like murals designed by local artists, investing in infrastructure that provide access to transit options or including healing spaces for residents.

The Need to Shift the Approach

The final point discussed throughout the interviews is the gap between the collective understanding and the approach. In order to shift the design approach to compensate for the challenges mentioned in Table 2, designers need to understand the circumstance of the target community to be able to find an effective design strategy that advocates for their needs and provides what is missing. Julia, a project manager for an affordable housing design company, suggests first steps are "identifying like where, where design can have different social impacts. Like, um, thinking beyond just the aesthetics of things." Another thing to think about as Carter mentions is to "identify ways to create community places in buildings that, um, that engender connection…so that people can ease into, into community at their pace." The issue to address here is that there is no standard or universal understanding of these ideas nor the terms that address them for them to be applied in practice. This was made apparent as each participant of the study mentioned to some capacity the need for a better design framework and company approach to improve the affordability, representation, and reintegration aspects of affordable housing. Concepts like rejuvenative urbanism and regenerative design are important when discussing these ideas, yet the majority of professionals interviewed have never used or could not define the terms. Carter defines rejuvenative urbanism as "reclaiming the right of way and evicting the vehicle, um and creating places where kids and ecosystems and, um, and communities reclaim, uh, that space, um, for productive relationships." Designing a space that enhances and restores

the natural environment that the community can fall in love with is the goal, not only does this serve the social need but it allows for more sustainable design. The collective solution to this problem, stated by professionals, is to create a design framework that can be used in practice to appeal to the themes within the framework, displayed in Figure 4, that can sometimes be lost in the process.

Discussion of Findings

The theoretical framework (Barron & Gauntlett) presented is to better understand the connection between social equity and environmental sustainability. It is shown that the main difficulty in integrating these concepts in sustainable design lies with understanding their relationship and the impact they have on each other, in relation to affordable housing. It involves a stronger focus on designing communities with the needs of the people in mind and allowing them to express their needs throughout the process. This study shows that there is a certain social impact that this kind of housing addresses including but not limited to community engagement, establishing identity, fostering connection, and public well-being. All in all, each theme represents to some capacity the need to provide the same basic needs with dignity as if one were designing for a community that could afford it. This means stripping away the stereotypes and biases that surround these populations and becoming active in the community

through network to be able to understand that a sustainable environment is synonymous with a sustainable community. With these steps in mind, the work to improve the current understanding will allow for a different approach to provide the needs to disadvantaged groups that will inherently benefit the entire community, socially and sustainably.

Implications and Conclusions

This research aims to express the importance of using the social equity perspective as a supporting framework rather than a separate component when practicing environmental sustainability. This study can help other design professionals by providing insight on the opportunities of overcoming the current barriers. To reach this goal, professionals need to acknowledge the challenges they face in making connections between the social (equity) and the environmental aspects of sustainability in their project work. In addition, the idea is to use what is learned to create a design framework that works for the design team and implements the needs communicated into the design. From there, the design professionals' experience should provide insight to come up with a company market strategy that educates developers as well as society so the design can serve the need. This discussion is to acknowledge the need for advocacy and offer another perspective to change the way designers look at sustainable design. If designers can shift the approach with how they design, then the success stories can be highlighted and we can look forward to the opportunities within.

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Skin conductance level and its association with camouflaging score in individuals with autism spectrum disorder

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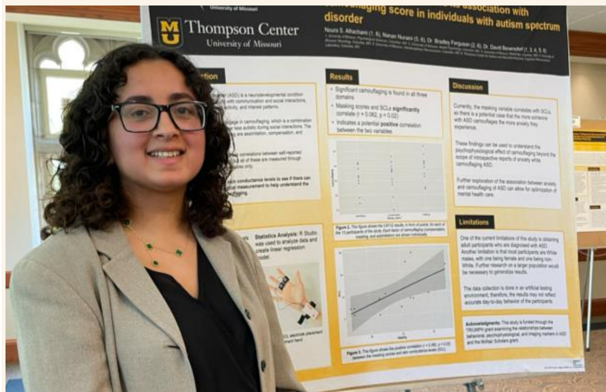

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Autism spectrum disorder (ASD) is a neurodevelopmental condition distinguished by difficulty with communication and social interactions, and repetitive behavior, activity, and interest patterns. Many people with ASD engage in camouflaging, a combination of strategies used to appear less autistic during social interactions. The Camouflaging Autistic Traits Questionnaire (CAT-Q) details three factors of camouflaging: assimilation, masking, and compensation. Current studies measure the association between camouflaging of autism and anxiety through subjective measures, such as self-reports. Objective assessments of anxiety are lacking. However, anxiety is associated with increased sympathetic nervous system arousal. The sympathetic nervous system, a part of the autonomic nervous system, prepares the body for stressful situations, which results in physiological processes such as increased heart rate and sweat gland activity. Skin conductance levels (SCLs) are a suitable proxy of the autonomic nervous system and can indicate sympathetic nervous system activity. This study will utilize SCLs as an objective, psychophysiological measurement to help understand the role of anxiety in camouflaging. This study measures 13 participants, ages 18-35 years old, and will be comparing their 25-item CAT-Q to their skin conductance levels to see if self-reports of camouflaging are correlated with SCLs. The masking variable is positively correlated with SCLs, so there is a potential case that the more someone with ASD masks, the more anxiety they experience. These findings can help understand the psychophysiological effect of camouflaging beyond the scope of introspective reports. Further exploration of the association between anxiety and camouflaging of ASD can allow for optimization of mental health care.

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition distinguished by difficulty with communication and social interactions, and repetitive behavior, activity, and interest patterns (American Psychiatric Association, 2013). Many people with ASD engage in camouflaging, which is a combination of strategies used to appear less autistic

during social interactions. The Camouflaging Autistic Traits Questionnaire details three factors of camouflaging: assimilation, masking, and compensation (Hull et al., 2019). Many autistic people engage in camouflaging to avoid social stigma, blend in with a neurotypical society, or maintain social relationships (Perry et al., 2022). Though camouflaging is used by some individuals with ASD to maintain their social relationships, there are correlations between self-reported camouflaging and depression, general anxiety, social anxiety, suicidality and poor health overall (Perry et al., 2022). Existing research shows that autistic people state that engaging in camouflaging causes them increased experiences of mental and physical exhaustion and is confusing for self-identity (Perry et al., 2022). Camouflaging is a defense against social stigma for those with ASD, but constantly being defensive when interacting with others causes continuous anxiety and can result in burnout (Mandy, 2019). Autism is also associated with atypical autonomous nervous system activity, including the sympathetic nervous system which is involved with anxiety reactions and regulates physiological processes such as heart rate and sweat gland activity (Taylor et al., 2021). The sympathetic system (SNS), a part of the autonomic nervous system, controls preparing the body for stressful situations, which would be expected to be related to camouflaging since it is a defense mechanism against “a sense of alienation and threat” (Mandy, 2019). Skin conductance can indicate SNS activity as the increased sweating is also an increase in the skin’s conduct of electrical activity (Benito-Gomez et al., 2019). Currently the correlation between camouflaging of autism and anxiety are measured through behavioral, subjective manners. This study will utilize skin conductance levels to see if there can be a psychophysiological measurement to help understand the role of anxiety in camouflaging.

Anxiety and Camouflaging of Autism

As stated previously, camouflaging is the strategy used to mask social difficulties and passing as someone without a neurodevelopmental issue, and it is commonly seen in autistic individuals (Hull et al., 2019). Compensation includes copying others’ body language and repeating others’ tone, masking includes monitoring and adjusting face and body to appear relaxed and interested in others, and assimilation includes forcing oneself to socialize and pretending to be “normal” while socializing (Hull et al., 2019). Qualitative research, such as subjective self-reports, shows that autistic people describe camouflaging as a process that causes them to experience greater physical and mental exhaustion, depression, social and general anxiety, and suicidality (Perry et al., 2022). However, not all people with autism camouflage the same or at the same rate. There are increased instances of camouflaging in female and non-binary people, as well as differing strategies of camouflaging autism used by males versus female and non-binary populations (Wood-Downie et al., 2021). The Woodie-Downie et al. study had results that indicated females with autism have higher social reciprocity than males with autism, even if they have similar autistic traits and theory of mind (2021). This might be related to camouflaging – potentially, females with autism are camouflaging their behavior and compensating more than males with autism, which may contribute to the difficulty in diagnosing and treating females with autism.

Late diagnosis of autism spectrum disorder is also claimed to be associated with higher rates of negative mental health, including higher rates of anxiety, depression, and suicidality (Perry et al., 2022). Potentially, those who camouflage are diagnosed later and therefore experience greater anxiety. With further research into camouflaging autism, such as trying to find an objective marker for the presence of anxiety when camouflaging through the psychophysiological measure of skin conductance levels, better understanding can be provided regarding the claim that camouflaging is an unhealthy practice. This can indicate the need to change the structures around those with autism, such as improving education to reduce stigma and intervene with the non-autistic population (Sasson et al., 2017). It can also indicate that clinicians may need to develop assessments to scan for camouflaging and identify it in their patients and to raise their awareness of the stigma those with autism face. Camouflaging is a defense mechanism against the trauma of repeated stigma, and there is a need for research to further understand its impact on anxiety within the autistic community.

Skin Conductance and Anxiety

Skin conductance is an autonomic arousal measure of the sympathetic nervous system, which is heavily involved in anxiety and a measure of psychophysiological arousal. The Rosebrock et al. study had participants who were all diagnosed with major depression disorder, some with diagnosed anxiety and some without, and are compared to a control group without depression or anxiety (2017). Results show that skin conductance data was higher for all participants when threat images were presented. Anxious participants rated emotional images as more arousing when compared to the control group. However, there were no observable differences for depression-only

participants and the control group. These results indicate consistency with the idea that skin conductance is a useful proxy for anxiety-related systems, such as the autonomic nervous system and sympathetic nervous system. Therefore, skin conductance is a more suitable proxy for anxiety measurements rather than depression. This supports the importance of using skin conductance data when assessing camouflaging, as anxiety is a common co-occurrence for autism spectrum disorder. As discussed above, anxiety is associated with atypical autonomic nervous system function, and autism spectrum disorder shows an association with atypical autonomic nervous system function, but little is known about this relationship (Taylor et al., 2021). A study that compared autonomic nervous system function between adults with and without autism showed that though individuals with autism show greater autonomic nervous system dysfunction, the difference between autistic individuals and neurotypical individuals was not significant after controlling for anxiety and depression (Taylor et al., 2021). The same study found that anxiety was critical in the relationship between autistic traits and autonomic nervous system function. These results indicate that a dysfunctional autonomic nervous system is not necessarily caused by the presence of autism spectrum disorder. Instead, it is most likely that the co-occurrence of anxiety is the reason for atypical autonomic nervous system function (Taylor et al., 2021). In a study that had twenty-five infants in the same age-range shown happy, neutral, and angry feminine faces, results showed that skin conductance responses were highest to angry facial expressions (Nava et al., 2016). This may indicate that negative emotions have higher noticeability, even if not consciously recognized. This could be relevant to the processes of camouflaging autism spectrum disorder, as skin conductance could indicate anxiety responses that individuals may not be consciously aware of.

Skin Conductance Levels and Anxiety of Camouflaging

The Camouflaging Autistic Traits Questionnaire was developed due to there being no existing self-report measures of social camouflaging behaviors. This 25-item questionnaire was utilized online by 354 autistic and 478 non-autistic adults and explores three factors: assimilation, masking, and compensation (Hull et al., 2019). The test was found to be internally consistent, had acceptable test-retest reliability, and convergent validity was shown through comparison with measures of autistic traits, wellbeing, anxiety, and depression. Overall, there was a great deal of evidence that provided support for the CAT-Q. There has been some criticism that many of the CAT-Q questions could be measuring anxiety-only (i.e, "I always think about the impression I make on other people"), but it is important to remember Hull created the CAT- Q in response to the growing frequency of masking being discussed in the autistic community (Hull et al., 2019). Hull wanted to create a questionnaire that encompasses all portions of camouflaging autism, so it inevitably has overlap with anxiety symptoms. This distinction is important, especially when considering a large portion of the autistic community self-report high levels of depression and anxiety when camouflaging and that much of camouflaging research currently is focusing on the relationship between camouflaging, anxiety, and autism spectrum disorder. The CAT-Q provides a more reliable method to subjectively measure camouflaging and see what individuals self-report, which can allow for comparison with psychophysiological measurements.

Current studies measure the correlation between camouflaging of autism and anxiety through subjective measures. Skin conductance levels are a suitable proxy of the sympathetic nervous system, one of the main neural pathways for stress response. This study will utilize SCLs as an objective, psychophysiological measurement to help understand the role of anxiety in camouflaging. The aim of this research is to see if SCLs can be associated with the presence of camouflaging in ASD. These findings can help understand the psychophysiological effect of camouflaging beyond the scope of introspective reports.

Method

This study will utilize skin conductance levels to see if there can be an objective, psychophysiological measurement to help understand the role of anxiety in camouflaging. This measures 13 participants, ages 18-35 years old, and will be comparing their Camouflaging Autistic Traits Questionnaire results of masking, assimilation, and compensation (Hull et al., 2019) to their skin conductance levels to see if self-reports of camouflaging are correlated with SCLs. These participants are mostly white males, with the exception of one female. The questionnaire will show how often participants engage in camouflaging their autism. The collection of skin conductance levels is a measure that involves autonomic nervous system activity, which may provide a biological marker associated with anxiety when camouflaging autism (Hickman et al., 2022). The participants for this research are patients from the Thompson Autism Center that were contacted by research specialists. These participants provided consent

for participating in a screening and two data collection visits, and this data will focus only on the first visit as that is when SCL data is collected.

Camouflaging Autistic Traits Questionnaire

A Camouflaging Autistic Traits Questionnaire (CAT-Q) will be given to participants, and the results will be compared to the skin conductance levels. The questionnaire has 25 items that detail strategies of masking autistic characteristics when socializing. An example of one of the items is “In my own social interactions, I use behaviors that I have learned from watching other people interacting” (Hull et al., 2019). Subjects utilize a seven-point Likert scale to indicate their responses, with one being Strongly Disagree and seven being Strongly Agree. These items will correspond with three factors of camouflaging, which are masking, assimilation, and compensation. The total camouflaging scores range from 25 to 175, with higher scores indicating greater camouflaging.

Skin Conductance Level

Skin conductance levels will be collected in a testing room at the Thompson Autism Center. Participants will have two disposable Ag-AgCl snap electrodes placed on the inside of their non-dominant hand’s palm to collect skin conductance data. Signals from the electrodes are amplified by GSR 100C amplifiers connected to a BIOPAC MP150 Data Acquisition System. Participants are instructed to remain still and breathe regularly during data collection, and to keep their eyes on a cross drawn on the wall during the collection period. We give them three minutes to adjust to their surroundings, an acclimation period, and then skin conductance is recorded over five minutes to assess skin conductance levels. At the eight minute mark, data relevant to skin conductance should be completed.

Results

Camouflaging Autistic Traits Questionnaire

In the CAT-Q, nine of the items measured compensation, eight of the items measured masking, and the remaining eight measured assimilation and each item is rated using a seven- point Likert scale. Figure 1 shows the total scores they received for each of the three camouflaging factors. Compensation had a mean of 33.0 points with a standard deviation of 9.94, masking had a mean of 37.8 points with a standard deviation of 9.28, and assimilation had a mean of 33.1 with a standard deviation of 8.60, suggesting significant camouflaging in all domains.

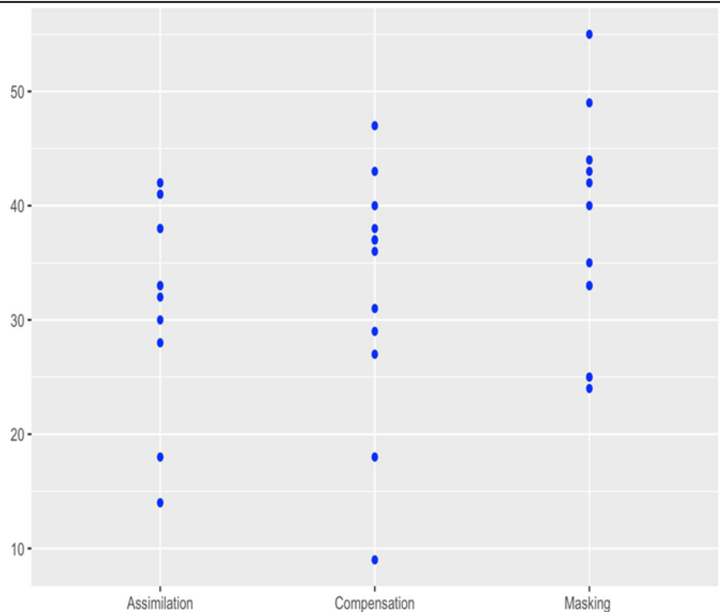

Figure 1. This figure shows the CAT-Q results, in form of points, for each of the 13 participants of the study. Each factor of camouflaging (compensation, masking, and assimilation) are shown individually.

Skin Conductance Levels

The results for skin conductance levels had a great amount of variation, such as the first participant having a large amount of SCL activity (28.4 microSiemens) while the second participant barely had a response (0.52 microSiemens). Overall, SCLs had a mean of 10.1 microSiemens but with a high standard deviation of 8.74.

Comparing the CAT-Q and SCLs

When examining the relationship between SCLs and camouflaging, assimilation and compensation scores did not correlate with SCLs. However, masking scores and SCLs did significantly correlate ($r = 0.62$, $p = 0.02$), indicating a potential correlation between the two variables. Figure 2 shows the positive correlation trend between masking and SCLs. Therefore, greater masking was associated with greater psychophysiological arousal.

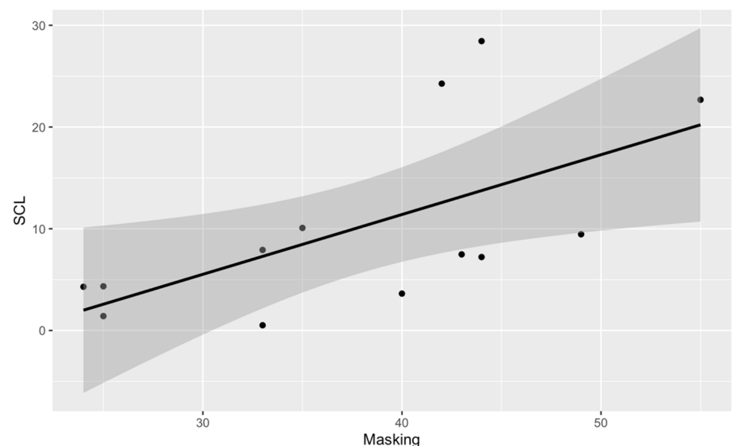

Figure 2. This figure shows the positive correlation between the masking scores and skin conductance levels (SCL).

Discussion

The current study aimed to understand the role of anxiety in the camouflaging of autism spectrum disorder, specifically by using skin conductance levels as a proxy of sympathetic nervous system activity and correlating that with assimilation, compensation, and masking (Benito-Gomez et al., 2019; Hull et al., 2019). Our hypothesis was that all three factors of camouflaging would be positively correlated with SCLs. Though our participants showed significant camouflaging with all three factors, exploration of camouflaging and SCLs showcased that only masking had a significant positive correlation. Assimilation and compensation both had no significant correlation with SCLs. If further research shows similar results to this study there is an indication that masking may have unexplored differences compared to the other camouflaging factors, potentially opening up a new focus of research on the specific components of camouflaging.

A limitation of this study is the participants, both in size and gender diversity. Ideally, future studies will be able to replicate this study and show whether or not these results are consistent with a larger number of participants. Our 13 participants were mostly white males, with the exception of one participant being female. Previous literature has indicated that women and nonbinary people with ASD camouflage at different rates than men (Wood-Downie et al., 2021). There is also potential that those who camouflage more are more likely to be diagnosed later, which is associated with higher rates of anxiety, depression, and suicidality (Perry et al., 2022). It would be important to understand the correlation between camouflaging and SCLs while seeing if there are any gender divides in the rates of camouflaging, rates of late diagnosis, or in the mental health factors associated with camouflaging.

Since this experiment is performed in the laboratory setting, it may not entirely reflect real-world performances of camouflaging. However, multiple studies indicate that skin conductance levels are a useful proxy for measuring the autonomic nervous system and the presence of anxiety (Benito-Gomez et al., 2019; Hickman et al., 2022; Nava et al., 2016).
Alexithymia is the inability to recognize or describe one's own emotions and a tendency towards externally-oriented thinking, and alexithymia is common in those with ASD (Hickman et al., 2022). This means many of those with ASD struggle with reporting their emotions, highlighting the need to explore objective measurements, such as psychophysiological measures like SCLs, to augment our understanding of the impact of camouflaging. There could also be benefits with expanding this research to other objective measures, such as heart rate variability, to contribute to the understanding of how self-reports, anxiety, and camouflaging affect one another and how this impacts care.

If further research shows a correlation between masking and psychophysiological arousal, having a biomarker (such as SCLs) for anxiety when camouflaging ASD can have various clinical applications. One potential application is discovering ways to improve the benefits of camouflaging (maintaining jobs and social relations) while reducing the negative mental health effects (Perry et al., 2022), aided by having a more complete understanding of its impact on the individual. Since camouflaging is a defense against social trauma, it can also indicate the need to improve education to non-autistic populations to reduce stigma and prevent discrimination of those with ASD (Sasson et al., 2017). Another possible application is the potential to give clinicians and healthcare professionals an added tool to help them become more aware of camouflaging and anxiety symptoms, as camouflaging indicates feeling the need to remain socially defensive, in the ASD population, and try to prevent burnout (Mandy, 2019). A recommendation for clinical application could be the development of assessments to identify camouflaging in patients earlier on, hopefully intervening as soon as possible to combat the negative mental health effects self-reported with camouflaging. Overall, more research needs to explore the relationship between camouflaging and psychophysiological arousal, building on this indication of a correlation between masking and anxiety, in order to understand the mechanism and potential implications.

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Best practices for working with LGBTQ+ survivors of interpersonal violence

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Background
Interpersonal violence, which can include sexual assault (SA), physical violence, coercive control, psychological abuse, and/or stalking, affects one in three women and one in four men (Sugg, 2015, p. 630). Studies have also shown experiencing violent victimization can be a direct risk factor for multiple physical health conditions long after the abuse as well as contributing to an increased risk for homicide (Campbell, 2002). Lesbian, Gay, Bisexual, Trans, and Queer (LGBTQ+) people are at greatest risk for experiencing violence (Coulter & Rankin, 2020), with estimates indicating they are nine times more likely to experience interpersonal violence, sexual, or gender-based violence than the general public (Flores et al., 2022; Whitfield et al., 2021), including being targeted for hate crimes (Park & Mykhyalyshyn, 2016) and general victimization (Reuter et al., 2017). LGBTQ+ individuals face many unique stressors and obstacles in daily life including decreased support from social relationships (Cao et al., 2017) and oppression (Robinson & Schmitz, 2021), both of which can leave individuals with a gender and sexual minority identity being isolated – a critical risk factor for intimate partner violence (IPV; violence or abuse from a romantic partner).

Consequently, LGBTQ+ individuals have a greater chance of developing mental disorders resulting from minority stressors (Meyer, 2003), such as oppression and victimization, which can lead to the development of Post-Traumatic Stress Disorder (Szymanski & Balsam, 2011), depression (Woodford et al., 2018), and suicidality (Espelage et al., 2018).
For gay men it is estimated that 26% to 33% experience IPV at some point in their life. For lesbian women this number is dramatically higher at 32%-44%. Even higher still is the rate for bisexual women at 61% to 91% who experience IPV (Langenderfer-Magruder et al., 2016).

For transgender individuals the chance of experiencing IPV is 1.7 times higher compared to cisgender rates (Peitzmeier et al., 2020). LGBTQ+ people are also at

the greatest risk for experiencing sexual violence in particular (Stotzer, 2009). The abuse statistics and lack of research on the topic are particularly alarming given IPV can lead to serious injury and death in addition to mental health concerns related to psychological safety and distress (Levendosky, Lannert,& Yalch, 2012).

Based on their disproportional exposure to overall violence, LGBTQ+ people would logically utilize support services the most, but that is not reality for most LGBTQ+ people. In one research study of gay, bisexual, and queer men who have sex with men, it was reported of the three out of five men who had experienced abuse only 1.3% had reached out to a helpline- a common starting point for help seeking (Salter et al., 2020). When LGBTQ+ individuals experience IPV, for example, they may be concerned about reporting it out of fear of judgement or that the incidence would reflect poorly on the LGBTQ+ community (Ard & Makadon, 2011). However, similar to heterosexual relationships, partner violence in same-sex relationships can take many forms including, but not limited to, intimate terrorism (or coercive control), situational couple violence, and mutual violent control (Hardesty et al., 2008). Utilizing this information, the questions must be asked why this data does not already exist. Indeed, IPV scholars call for more research on LGBTQ+ communities despite the concerns that this work can be unjustly politicized or used to harm the community (Hardesty et al, 2008). Avoiding the study of topics like interpersonal violence, or IPV more specifically results in further marginalization of vulnerable populations and silences the voices of those in need.

Abuse can be difficult to identify from a healthcare point of view with many medical providers lacking the awareness or training to assess for violence (Sprague et al., 2013). Another factor to consider is that seeking help may be perceived as unsafe, given that survivors are at particularly high risk of homicide from their abuser after a victim reaches out to police (Sherman & Harris, 2014). One research study puts it this way, in reference to gay male IPV police involvement:

"For male same-sex couples, mandatory legislation has a minor role in predicting arrest. For this group, it appears that offense seriousness is the more influential predictor.Although simple assaults are much more likely than intimidation offenses to result in arrest, aggravated assaults are more likely than simple assault to result in arrest. Here, it appears that the commission of a serious offense is needed to make some police officers treat an incident involving a male same- sex couple as a serious criminal matter" (Pattavina et al., 2007, p. 13).

This are just a few examples that demonstrate the obstacles LGBTQ+ people face when help seeking. A study focusing on the distinct obstacles lesbian survivors face noted, anti- patriarchal feminist ideals have shaped the legal landscape of domestic violence and those laws and ideals too often use theories of toxic masculinity that men employ as the cause of IPV (Simpson & Helfrich, 2014). This study highlights that gender and sexual minorities in particular may have concerns about the justice system treating them fairly.

There is a decreasing divide between IPV advocacy and the LGBTQ+ community (Claire & Buttell, 2015), part of this divide can be explained by a research project in North Carolina aimed at creating and inserting policies, procedures, and trainings that deal specifically with LGBTQ+ survivors (Sechrist et al., 2022). The research team argues that the people they have reached out to were told the agencies do not want to recognize a need for LGBTQ+ specialization because it could affect relationships with local community partners (Sechrist et al., 2022). This idea of LGBTQ+ survivor specialization is criticized by Simpson and Helfrich (2014) who instead argues for every employee having training regarding LGBTQ+ survivors. Their argument comes from the reported singling out of LGBTQ+ staff who are assigned all LGBTQ+ clients, which lead to providers feeling tokenized and burnt out.

Present Study

Given the dearth of research about LGBTQ+ survivors of interpersonal violence in general, there is limited information to help providers who work to support this population (Ford et al., 2013). It is also noted in some studies, services set up for LGBTQ+ survivors are reported to not be helpful (Santoniccolo, Trombetta, & Rollè, 2021). In order to further understand the most ethical methods of bridging this gap between interpersonal violence (e.g., domestic and sexual violence) services and LGBTQ+ survivors, we seek to understand the best practices for working with this population from the perspectives of expert professionals. Service providers offer a unique perspective as subject matter experts who can synthesize experiences across their broad caseloads versus just one anecdotal, case experience (Tlapek et al., 2020; Monk et al., 2022). By interviewing expert professionals like researchers and service providers instead of IPV survivors we are also ensuring that the re-traumatization and power imbalances that often exist within domestic violence

research are limited (Bender, 2017). Specifically, we seek to answer the following research question: What are reported concerns about help seeking and the service needs of LGBTQ+ survivors of interpersonal violence from the perspectives of service providers and researchers? Thus, we seek to inform best practice recommendations with a focus on implications for policy and practice.

Methods

Sample

The sample for this study included five experts (i.e., service providers or researchers) who had experience working with LGBTQ+ survivors of intimate partner violence, sexual assault, or human trafficking. Three out of the five identified themselves as service providers (60%), while the other two identified themselves as researchers (40%). Four out of five of the participants identified obtaining a PhD as their highest level of education (80%). Of the two remaining participants, one had obtained a Masters degree (20%) and the other a nursing license and a PhD (20%). One participant worked as a clinical licensed psychologist, one worked at a rape crisis center, one participant was a licensed social worker, and two worked as faculty researchers at universities. All five of the participants identified their race/ethnicity as white (100%). With regard to gender, Four out of five of the participants identified as nonbinary/genderqueer (80%) and one participant identified as a woman (20%). All of the participants self-selected to be a part of this study.

Data Collection & Procedure

We utilized (a) state coalitions against domestic violence websites and listservs, (b) Google scholar, and (c) online therapist locators (i.e., Psychology Today) to identify service providers who work with LGBTQ+ populations or researchers who have published on LGBTQ+ survivors of interpersonal violence to contact about their participation in the study. Once a participant expressed interest in the study, they completed an eligibility screening assessment via Qualtrics. Individuals were eligible for the study if they self-identified as working with or studied LGBTQ+ survivors of IPV or SA through being a service provider or researcher.

After verbal consent was given participants were interviewed using Zoom. The interview questions primarily focused on (1) identifying unique needs of LGBTQ+ survivors, (2) identifying unique stressors among LGBTQ+ survivors, and (3) identifying recommendations for service providers to best support LGBTQ+ survivors. Interviews lasted between 38 minutes and 1 hour and 16 minutes (M = 72.4). Participants received a $15 gift card for completing the interviews.

The interviews were transcribed verbatim using a professional transcription company. Pseudonyms were chosen by the participant to ensure anonymity while still representing their personal identity. The research team met regularly to discuss coding and common themes. For coding, some researchers utilized the coding program MAXQDA to better enhance theme interpretation.

Data Analysis

To analyze the data, we used techniques from Reflexive Thematic Analysis (Braun & Clarke, 2021). We first familiarized ourselves with the transcripts by reading them multiple times. Next, we focused on identifying frequently occurring codes across all transcripts. Coders then met to discuss common codes and to discuss salient themes across the transcripts. During the initial phases of coding, several codes stood out across all interviews and were organized around themes. Coding ceased when the coders reached a high degree of saturation (i.e., no new themes or ideas were identified in the data; Charmaz, 2014).

Results and Discussion

We found several significant themes across experts. First, all participants described a general mistrust of police among LGBTQ+ survivors. The experts in our study noted that their LGBTQ+ survivor clients expressed concerns with involving law enforcement for a variety of reasons including fears of gender stereotypes leading to the dismissing of violence or concerns that police involvement would exacerbate the violence. Another common theme that was seen was the importance of an organization being a safe space for LGBTQ+ survivors. Some participants suggested a standardized cultural competency test while others discussed prioritizing the co-production between client and therapist to create this safe space.

Mistrust of Police

All the participants mentioned a distrust of police being a common theme when working with LGBTQ+ survivors. One participant stated, "police are always a mixed bag for survivors at best. And I would say that it's even more so when you're talking about a same-sex relationship. They don't take it seriously. They're not helpful. They may be prejudiced themselves." (T0216B). This sentiment was

mimicked by all five participants. Part of this unhelpfulness comes from the gender stereotyping that police perpetrate when addressing intimate partner violence between two people of the same sex. This stereotyping can take the form of assuming that men are just violent or dismissing violence among women as non-threatening (Russell, 2016). In some situations, involving the police can increase violence, if police are not able to handle the situation appropriately (Grover, 2013).

Another participant stated, "working with police potentially is so – I think scary for most survivors, but like, particularly for people who have been like historically targeted by police, it's, you know, just added-added barriers and- and trauma" (M1212P). Many queer researchers and activists have echoed this same theme (Lorraine, 2019). As queer acceptance is not a default, it is understandable why a LGBTQ+ survivor would be hesitant to seek help from police.

This sentiment seemed to echo the voice of abolition activist, Angela Davis. Davis argues that the state systems of prisons and policing are additional forms of violence that survivors often face. She argues that instead of prison-based systems that we must utilize "community-based systems of care, support, and accountability" (see Meiners, 2022). Indeed, concerns about police involvement are noted in research on domestic violence in the general population, as well. Justice-involved individuals perceive that criminal justice professionals, including judges, lawyers, and police officers, can unintentionally or inadvertently create difficult environments that leave complainants feeling further victimized by the process (Landau, 2000; MacLeod, 1995). Some victims report negative experiences with police, including feeling not believed, judged, and blamed for their own victimization, particularly in cases of repeated calls to police (McGillivray & Comaskey, 1999; Wachholz & Miedema, 2000; Ursel, 2006).

Police officers' attitudes may influence whether or not a victim pursues recourse through the justice system (Logan et al., 2006), with some officers holding discouraging beliefs like that "reliable" victims dress conservatively (Sleath & Bull, 2012), have a reputable job (Page, 2008), and present a consistent narrative of events (Alderden & Ullman, 2012; Maddox et al., 2012). In instances when expectations of timely, consistent, and sequential reporting are not met, victims' motives and "truth-telling" have been questioned. Police have suspected false allegations (Venema, 2016), alleged "attention seeking" behavior (Barrett & Hamilton-Giachritsis, 2013, p. 208), and reported diminished credibility (Maddox et al., 2012). However, appropriate training has shown promise in increasing officer's awareness of IPV biases (e.g., victim blaming, disbelief) and increasing the likelihood of changes in practices like collecting evidence and time on the call (Blaney, 2009; Huisman et al., 2005; Ruff, 2012). Our findings reinforce the need for further training among law enforcement, as well as working with communities to improve perceptions of police.

Creating a Safe Space

Relatedly, participants described a prioritization of spaces for LGBTQ+ survivors being safe. To connect the two main themes that we found, the participants identified that a space that utilizes police, law enforcement, or state control are not safe spaces for LGBTQ+ survivors. We found that all participants prioritized safety when identifying needs of LGBTQ+ survivors.

One participant used the word "safe space", but all five participants did provide examples that prioritized LGBTQ+ survivors feeling safe to be who they are. One major facet of creating a safe space for LGBTQ+ survivors was ensuring that service providers had cultural competency training. In reference to culturally incompetent providers one participant said, "they really fear cultural incompetency that if they go to any other kind of provider, if they work with any other kind of provider, that they fear that they won't be taken seriously" (K0216G). Not only would this provide the understanding and knowledge that would help the service provider better provide services, it would also signify to LGBTQ+ survivors that the organization prioritizes LGBTQ+ safety. This cultural competency training would need to be standardized and widely used.

One thing that stuck out from one participant was "decentralizes the therapy around the therapist as the professional, and kind of makes it more collaborative, and sort of more equal" (S0216M). The participant went on to explain how this power shift is "essential" for minority folks in therapy. Using this power shift to create a collaborative therapy experience for LGBTQ+ survivors connect with the idea of community care, support, and accountability that Davis suggests (Davis cite). This relinquishing of the expert role and not making assumptions by providers also allows clients to feel more like the active experts in their own experience (Monk et al., 2022). By using this therapy method a safe space can be created for LGBTQ+ survivors. One participant discussed how

they, “learn(ing) how to co-create safety in our relationship for the client to understand how to co-create safety with themselves, with their body, how to know what feels okay because they’ve never actually had someone ask them, you know, like how, or maybe they have, but they haven’t had somebody ask them who they felt safe answering to. You know, like how they really feel when they are safe in their body.” (K0216G). This is just one example that showcases how creating a safe space within therapy is foundational for the client.

The participants identified that a unique need of LGBTQ+ survivors in minimal interaction with police for organizations to be a safe space. A barrier that many LGBTQ+ survivors face is the police. Many LGBTQ+ survivors do not feel comfortable with police presence and a space cannot be a safe space for LGBTQ+ survivors if police are a key aspect of the space. The recommendations that the participants provided were to focus on creating a safe space for LGBTQ+ survivors. One way they recommended doing this was by having cultural competency trainings. The mix of cultural competency trainings, and minimal police interaction create the conditions for a LGBTQ+ survivor safe space to exist.

Implications for Practice

From the data we gathered, it can be inferred that creating a safe space for LGBTQ+ survivors must be prioritized. This safe space needs to include a cultural competency training for all staff. This training must be known to the public and must be a key facet of the organization’s values. A safe space must also include collaborative therapy that does not re-enforce state power dynamics on the survivor and instead prioritizes the collaborative process. Lastly, a space is not safe for LGBTQ+ survivors if police are being utilized as a core structure within the organization. Similar to trainings for providers, law enforcement may benefit from continuing education around LGBTQ+ needs and the needs of survivors of domestic violence. Law enforcement officers also report a lack of training in this area and, although not systemic across all agencies, research has documented general shortcomings in victim-centered police response to survivors (see Franklin et al., 2020). IPV and Domestic-violence-related police calls constitute the single largest category of calls received by police in years past -- accounting for 15% to more than 50% of all calls (NIJ, 2009). Experiencing abuse is a strong predictor of subsequent victimization, because even leaving an abusive relationship does not ensure the abuse will stop (Hardesty & Ganong, 2006) and attempts to leave may even cause the violence to escalate without appropriate intervention (see Klein et al., 2005; Nichols, 2019). Therefore, police officers provide a critical component in the intervention process (Gwinn & O’Dell, 1993) and could be able to prevent the violence from continuing and escalating.

Limitations and Future Directions

One major limitation of this study came in the form of a lack of racial/ethnic diversity. All participants of this study self-identified as white. To gain a more accurate perspective it would need to have racial/ethnic diversity within the participants. Relatedly, another limitation of this study is the low number of participants. In order to gain a more solid understanding of the needs, barriers to help seeking, and recommendations from providers, a larger number of participants would need to be interviewed.

Our primary goal was to interview service providers that work with LGBTQ+ survivors. This outreach proved very challenging due to time constraints and increasing demands place on mental health professionals (cite). Perhaps adding to the difficulty is the minimal trainings that lots of non-profit agencies provide. One asset to this study was the nurse who participated. Many victims might not reach out to mental health providers or even identify it as abuse, but many IPV victims have seen a health care provider with 41% of murdered women having been seen in a health care setting before their death (Sharps et al., 2001), making these providers front lineworkers and potentially the only professional some victims see. For example, however, trauma surgeons (the medical professionals most likely to treat serious IPV injuries) and other health care professionals do not have the appropriate IPV training and may hold problematic beliefs (e.g., Victim blaming like “she must have deserved this”; De La Roca et al., 2013). Inclusion of informed and trained health care professionals in future studies would therefore be critical and would have implications for improving treatment in these and other settings.

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Relationship between stigma and cultural variables to Latinx college students' willingness to seek mental health help

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Introduction

There is a stigma surrounding mental health within the Latinx community in the United States. This stigma is created by several unique barriers, which include language, poverty, lack of awareness, family background, and cultural differences. Why are Latinx adults not receiving the proper treatment that is necessary? According to the US Census Bureau, 17.0% of Latinx people in the U.S. live in poverty (US Census Bureau, 2020). Higher poverty rates create a shift in priorities within communities. As a result, mental health is of a lower priority because people in poverty are trying to meet their basic needs. The US Census Bureau also reported that 13.2% of people in the United States speak Spanish at home (US Census Bureau, 2020). In general, a language barrier makes it more difficult to find mental health professionals that speak the language, but also can create a sense of embarrassment or frustration when seeking mental health help. Family and cultural differences also contribute to the stigma surrounding mental health help. In Latinx cultures people are expected to not let emotions consume their mind; therefore, they are then expected to persevere and let the emotions pass. However, negative emotions should not go unnoticed or unnoticed within these communities since they are at a higher risk for mental health disorders. In fact, the generalized anxiety disorder prevalence was 8.6 percent for White Americans, 4.9 percent for African Americans, 2.4 percent for Asian Americans, and 5.8 percent for Hispanics (Recovery Village, 2022). The PTSD prevalence was 6.5 percent for White Americans, 8.6 percent for African Americans, 1.6 percent for Asian Americans, and 5.6 percent for Hispanic Americans (Recovery Village, 2022). However, "rates of depression are lower in blacks (24.6%) and Hispanics (19.6%) than in whites (34.7%)" (American Psychiatric Association, 2017).

Above I discussed the prevalence rates for mental health disorders within diverse communities and I also discussed the factors that influence help seeking. However, how many diverse communities receive

treatment for a mental health disorder? According to the American Psychiatric Association, 48% of White, 32.6% of Hispanic, 30.6% of Black, and 20.2% of Asian populations received mental health service in 2017 (American Psychiatric Association, 2017). With minority populations receiving less mental health services or treatment, they are less likely to help seek. There is not a general or agreed upon definition for mental health help seeking. Brief definitions include ones' willingness to obtain help and researching for help concerning a mental illness. However, understanding one's willingness to seek care is crucial to helping Latinx individuals receive treatment when needed. As previously mentioned, poverty is a contributing factor to help seeking. The American Psychiatric Association reported that 27% of African Americans live below the poverty level (American Psychiatric Association, 2017). A total of "11.1% of Asian Americans and 15.4% of Pacific Islanders live at the poverty level" (American Psychiatric Association, 2017). Also, the Census Bureau reported that 17.0% of Latinx people in the U.S. live in poverty (US Census Bureau, 2020).

Although there are issues concerning mental health in Latinx communities, there are rising issues within the age range of 18–25-year-olds as well. "More than half of Hispanic young adults ages 18-25 with serious mental illness may not receive treatment" (Khubchandani et al., 2022). As a result of this, suicide rates have dramatically increased for young Latinx adults. In fact, suicide rates increased 35.7% Latino men and 40.6% for Latina women from the period of 2010 to 2020 (Khubchandani et al., 2022). Latinx college students fit within the age range mentioned; therefore, they are at a higher risk for struggling with a mental illness and not receiving treatment.

Cultural Determinants of Help Seeking Model

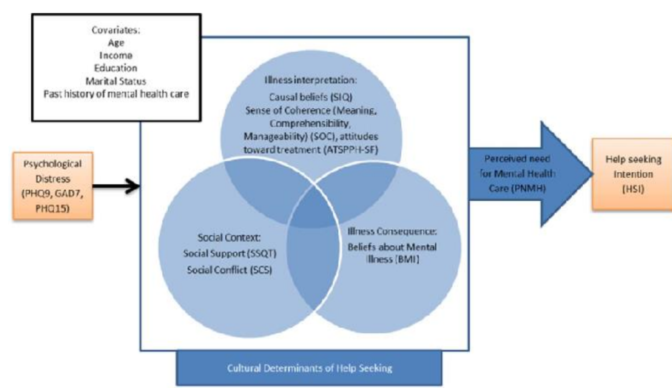

Fig. 1. Cultural determinants of help seeking (CDH) theory

The "Cultural Determinants of Help Seeking model" (CDHS Saint Arnault et al., 2018) identifies the different factors that influence mental health help-seeking behaviors. The model begins with an experience of psychological distress. Psychological distress can be defined as "a set of painful mental and physical symptoms that are associated with normal fluctuations of mood in most people" (APA, 2023).
Psychological distress is related to cultural determinants that are believed to inform an individual's decision to pursue professional help. These cultural determinants include as illness interpretation, illness consequence, and social context. Illness interpretation is defined as cultural beliefs surrounding the illness and the cause of it. Example variables for illness interpretation would include willingness or attitude towards seeking help. Illness consequence focuses on a person's expectations of others' perceptions of them. An example variable for illness consequence would include family beliefs. Lastly, social context describes social support and the social world. An example of a variable for social context would include community resources focused on mental health help. Collectively, these cultural determinants are believed to influence perceived need for mental health care and help seeking intentions. There are also several covariates such as age, income, education, marital status, and past history of mental health care that influence help seeking intentions.

The CDHS model is based on cultural determinants of help-seeking (CDHS) theory (Saint Saint Arnault, 2009), which focuses on help-seeking in a variety of cultures. This theory expands on the concept of *"idioms of wellness or distress."* This can be defined as "a collection of physical, emotional and interpersonal sensations and experiences labeled by the individual as optimal or abnormal, and identified as important" (Saint Arnault, 2009). This concept provides recognition patterns of help seeking for multicultural populations. The CDHS theory was developed by examining a diverse set of literature to identify theoretical concepts that had clinical relevance to the topic. The theoretical concepts were then combined to create the CDHS model. Although this model was originally designed based on a sample of Korean women, it has been applied in research to understand mental health help-seeking behaviors of different cultural groups.

One study examined social networks and conformity with a sample of 49 Japanese women (Saint Arnault et al., 2011). This study found that the Japanese women in the study had engaged in complex and regulated social networks. Japanese women also reported that, "Traditional cultural norms of *ryoosai kenbo* (good wives and wise

mothers) were expected from modern women"(Saint Arnault et al., 2011). Although these networks can be beneficial, they can promote gossip and can have a negative impact on ones' well-being. The study concluded that these complex social networks and need for conformity negatively affect Japanese women's mental health and their willingness to help seek.

Researchers have been looking for an instrument that is culturally applicable when examining a person's distress. In another study Saint Arnault and Shimaburkuro examined 212 first- generation Japanese women and their "distress experiences, values and attitudes related to distress and help seeking, and help-seeking experiences in the last year" (Saint Arnault et al., 2011). From this sample, researchers identified and conducted interviews with a subsample of 24 women that were "highly distressed". Participants completed "body maps" to identify where they felt pain and "lifelines" to identify distress throughout their lives. This study found that these methods helped provide the participants with personal insight about their mental health. The interviewing process also promoted exploration of the person's distress across the lifespan and exploration of where distress occurred. This study focused on the promotion of instruments to help better understand individuals struggling with distress.

An additional study examined the gap within funding of mixed methods research projects by examining an "National Institute of Mental Health project", Researchers found that mixed methods research projects have very few funding efforts and are expensive to complete. However, they are beneficial in examining health and its relation to culture (Saint Arnault et al. 2011).

Another study focused on a sample of 21 rural Irish women that had experienced domestic violence and their healing process. Saint Arnault and O'Halloran noted the research gap for sociocultural barriers to help-seeking within domestic violence. Researchers examined the stories of Irish women and found that sociocultural barriers such as social conflict, "feeling frozen", shame, and hopelessness were related to structural barriers (Saint Arnault et al., 2016). Structural barriers were defined as, how to escape an abusive situation and understanding the systems related to it. They also discovered that emotional and physical symptoms continued for extended periods of time with the women studied.

The research conducted based on the CDHS model, has demonstrated that this model of help seeking can be used cross-culturally. However, it has not been used to study Latinx individual's and men's experience with barriers to help-seeking. However, prior research has demonstrated that this model can be effective in analyzing barriers to help-seeking in a variety of situations and cultures.

Literature Review

This study will focus on exploring the relationship between attitudinal variables and cultural variables to Latinx college students' willingness to seek mental health help. In this next section, I am going to focus on previously conducted research in relation to what influences individuals to engage in mental health help seeking.

One study examined the influences that first generation Latinx students identified in seeking help for academic stressors. A total of 15 first generation Latinx students reported that how mental health was viewed in their family, their own well-being, awareness of programs, and support from friends, contributed to their ability to help seek (Coronado, 2022).

A similar study noted that prior research had failed to assess students' willingness to seek help at different time points, 6 months apart. Specifically, Cheng surveyed 173 Latinx college students at two different time points. The study measured the correlations of acculturative stress, family cohesion, family conflict, and depressive symptoms. Cheng discovered that acculturative stress was related to an increase in family cultural conflict, family cultural conflict contributed to higher levels of depressive symptoms, and family cohesion contributed to a decrease in family cultural conflict (Cheng, 2022). Although this study does not discuss these factors' influence on help seeking, it does isolate the importance of family and culture on one's mental health.

Other influences on help seeking are self-concealment and mental health stigma. Masuda, Mendoza, and Swartout conducted a study that examined 129 Latinx undergrad students with 76% of them being women. Researchers found that mental health stigma correlated to need for psychotherapeutic help, stigma tolerance, and interpersonal openness (Masuda et al, 2015). They also discovered that self- concealment was related to stigma tolerance and interpersonal openness.

In another study Chen, Kwan, and Sevig (2013), discussed influence on help seeking by questioning how others' perceptions influence one's help seeking process. Included in the sample were 260 African American, 166 Asian American, and 183 Latino American students

(Chen et al., 2013). Researchers used structural equation modeling (SEM) to test the effects of psychological distress and sociocultural variables on help seeking. The tested variables included: ethnic identity, other-group orientation, perceived discrimination, perceived stigmatization by others, and self-stigma. Researchers found that higher levels of psychological distress and racial ethnic discrimination contributed to higher levels of perceived stigmatization by others. They also found that higher levels of other group orientation were linked with lower levels of self-stigma. However, ethnic identity only contributed to low levels of self-stigma in African American populations.

Prior conducted research has discussed the variety of variables that influence mental health help- seeking. It notes that ethnic and racial minorities are influenced by perceptions of others, family, awareness, self-concealment, support and general stigma when it comes to seeking mental health help.
However, prior research fails to note the influence of external issues such as poverty, language barriers, and specific cultural differences. It also fails to focus solely on Latinx individuals and effects of gender socialization.

The purpose of this study is to explore the relationship between attitudinal variables and cultural variables to Latinx college students' willingness to seek mental health help. There is a lack of information on Latinx college students, mental health help seeking, and reasons for the reluctance to seek help. This study will survey students to discover what issues affect their attitudes and willingness to seek mental health services. Variables will include stigma, familism, ethnic identity, perceived social class, help seeking attitudes, help seeking intentions, and a mental health checklist. The following research questions will be explored: What is the relationship between acculturation, ethnic identity, familism, and perceived social class and intentions to seek mental health services? What is the relationship between stigma, help seeking attitudes, and mental health well-being, and intentions to seek mental health services? What is the relationship of these cultural variables with help seeking attitudinal variables?

Method

Participants

Twenty-five cases were removed from the data due to completing less than 80% of the survey, resulting in a final sample of 232 college students. The participant age range was from 18-45. 100% of the participants identified as Latinx, 68% of the participants identified as cisgender female, and 30.6% of the participants identified as undergraduate seniors.

Procedures

Approval for the study was obtained through the Institutional Review Board at the University of Missouri. Participants were recruited to complete an anonymous online survey on Qualtrics.
Recruitment of Latinx college students was conducted through email and social media, and via snowball sampling. Emails were sent to Latinx organizations at college/university campuses across the United States and college/university faculty. The emails requested that the organizations and faculty send the description of the study, flyer, and link to the survey to Latinx students. Emails also specified that the flyer and link to the online survey could be posted on social media platforms (Facebook, Instagram, and Snapchat). The description of the study contained a brief outline of the researcher's background, the purpose of the study, and details concerning the online survey. The flyer contained information about the research project, a QR Code, a link to the survey, eligibility criteria, and contact information for the researchers. To participate in the study, students must be 18 years or older, identify as Latinx, and be currently enrolled at a university in the United States. The survey prompted participants to read a consent form and provide electronic consent to the terms of participation. The Qualtrics survey included demographic questions, along with measures to assess acculturation, perceived social class, mental health stigma, familism, ethnic identity, mental health help seeking intentions, mental health seeking attitudes, and a mental health checklist. At the end of the survey, participants were asked if they would like to participate in a raffle for the opportunity to win 1 of three $100 Amazon gift cards.

Social Class

The MacArthur Scale of Subjective Social Status (MacArthur SSS Scale; Adler, 2000) was used to assess an individual's social class. The MacArthur SSS Scale is a ladder that has ten rungs. The measure itself consists of 1 item that assesses an individual's perception of their social class standing in the United States.

Researchers have the option to use a second item that assesses an individual's social class standing within their community. The first item represents the socioeconomic status ladder subscale, and the second item represents the community ladder subscale. For both items, individuals are asked to place an "X" on the rung where they think that they stand at that time in their life. To

score this measure, researchers take note of where the individual placed an "X." on the (1-10) rungs.

A separate study yielded a test-retest reliability of *p* = 0.62 (Operario, Adler, & Williams, 2004). The MacArthur SSS Scale also demonstrated good convergent validity because social status correlated with income, education, and health outcomes (Operario, Adler, & Williams, 2004).

Acculturation

The revised version of the Acculturation Rating Scale for Mexican Americans (ARSMA-II; Cuellar, Arnold, and Maldonado,1995) was used to examine individuals' acculturation in relation to white and Mexican cultures. The ARSMA-II contains 30 items that are divided into two subscales. There is the 13-item Anglo Orientation Subscale (AOS) and the 17-item Mexican Orientation Subscale (MOS). Some samples of AOS items include, "I associate with Anglos" and "My friends, while I was growing up, were of Anglo origin." Some sample MOS items include, "I associate with Mexicans and/or Mexican Americans" and "I enjoy listening to Spanish language music." Participants respond to the 30 items on a 5-point likert scale that ranges from 1 (*not at all*) to 5 (*extremely often or almost always*). To score this measure, the average is taken from both subscales to assess an individual's orientation to both Mexican and white cultures, respectively. High scores on each subscale indicate a high level of orientation towards the specified culture.

A prior study that used the ARSMA-II yielded a Cronbach's alpha of .93 for the AOS subscale and .83 for the MOS subscale (Jimenez et al., 2010). The ARSMA-II has been found to have strong construct validity, concurrent validity, and high convergent validity (Jimenez et al., 2010). Also, ARSMA-II scores were highly correlated with those of the original ARSMA scale (Jimenez et al., 2010).

The Brief Acculturation Rating Scale for Mexican Americans-II was developed based on the original ARSMA-II (Bauman, 2005). The Brief ARSMA-II contains 12 items that are divided into two subscales, the MOS and AOS. To score this measure, items from each subscale are added and divided by 6.

Familism

The Attitudinal Familism scale was developed to examine familism among Latinx samples (Lugo Steidel and Contreras, 2003). The Attitudinal Familism scale contains 18 items that are both original and adaptations of items from other scales. The items were developed in English and then translated into Spanish. Some examples of items include "The family should control the behavior of children younger than 18" and "Parents and grandparents should be treated with great respect regardless of their differences in views." Within the attitudinal familism scale there are four subscales: Familial Support, Familial Interconnectedness, Familial Honor, and Subjugation of Self for Family.

Participants respond to the 18 items on a 10-point Likert-type scale ranging from 1 (*strongly disagree*) to 10 (*strongly agree*). To score this measure, a mean score is calculated for each subscale and for the overall scale. High scores represent a higher prevalence of familism.

Within this study the attitudinal familism scale yielded a Cronbach's alpha of .83 for the overall scale, .72 for Familial Support, .69 for Familial Interconnectedness, .68 for Familial Honor, and .56 for Subjugation of Self for Family (Lugo Steidel and Contreras, 2003). To determine the validity of the Attitudinal family scale, correlations were calculated between scores on measures of familism, acculturation, generational status, and exposure to the U.S. (Lugo Steidel and Contreras, 2003). Familism scores correlated significantly with a measure of acculturation ($r = -.20$; $p = .02$), educational level ($r = -,21$, $p = .02$), and exposure to the U.S. Researchers found that as exposure to the U.S. increases, the sense of familism decreases (Lugo Steidel and Contreras, 2003).

Ethnic Identity

The Ethnic Identity Scale-Brief (EIS-B; Douglass, S., & Umaña-Taylor, A. J., 2015) is a brief measure of the original Ethnic Identity Scale (EIB, Umaña-Taylor et al., 2004) was developed to examine ethnic identity for adults and adolescents of a variety of races and ethnicities. The EIS assesses three dimensions of ethnic-racial identity: exploration of identity, resolution of what identity means to the individual, and affirmation of the negative and positive thoughts or feelings towards their ethnic group (Umaña-Taylor et al., 2004) The ethnic identity scale (brief) contains 9 items that can be administered in either English or Spanish languages. Sample items include "I am clear about what my ethnicity means to me" and "I have attended events that have helped me learn more about my ethnicity".

Participants respond to the 9 items on a 4-point Likert scale ranging from "Does not describe me at all" (1) to "Describes me very well" (4). There three items for each subscale (exploration, resolution, affirmation). To score this measure, the negatively worded items are first

reversed, and then subscales scores and overall scale scores are calculated. High scores for each subscale indicate high levels of affirmation, exploration, and resolution (Umaña-Taylor et al., 2004).

The EIS-B yielded moderately strong alpha coefficients ranging from .84 to .89 with an ethnically diverse sample (Umaña-Taylor et al., 2004).

Help Seeking Attitudes

The mental help seeking attitudes scale (MHSAS) was developed to examine help seeking attitudes (Hammer, Parent, and Spiker, 2018). The MHSAS contains 9 items and uses a seven-point semantic differential scale. Participants respond to the statement, "If I had a mental health concern, seeking help from a mental health professional would be…" by filling in the circle that relates to how they feel the most. The circles are labeled as (3, 2, 1, 0, 1, 2, 3).

Some examples include, "Useful-Useless" or "important-unimportant". To score this measure, items 2,4,6,8, and 9 need to be reverse coded. After they are reverse coded, a mean score is computed from the items, with high score indicates more favorable attitudes related to high help seeking attitudes

The MHSAS scale scores yielded strong Cronbach's alphas in both exploratory (a=.93) and confirmatory (a=.94) subsamples (Hammer, Parent, and Spiker, 2018). To establish evidence of validity of the MHSAS Scale scores, five experts with a counseling psychology doctorate that had experience with help seeking research were asked to view the items. Each individual rated each item on a scale ranging from 1 (does not fit the construct at all) to 5 (fits the construct very well). Items were kept that had a mean score for content evidence of 4.0 or higher.

Help Seeking Intentions

The mental help seeking intention scale (MHSIS) was developed to examine mental help seeking intentions (Hammer & Vogel, 2013). The MHSIS Scale contains 3 items; sample items include, "If I had a mental health concern, I would intend to seek help from a mental health professional", and "If I had a mental health concern, I would try to seek help from a mental health professional".

Participants respond to the 3 items on a likert scale ranging from, 1(*extremely unlikely*) to 7(*extremely likely*), 1 (*strongly disagree*) to 7 (*strongly agree*), and 1(*definitely false*) to 7(*definitely true*). Responses on the 3 items are averaged to determine a mean score.

The total mean scores can range from 1-7. Higher scores represent high intentions of seeking mental health help and lower scores represent lower intentions of seeking mental health help.

The MHSIS scores demonstrated high internal consistency with alpha scores of .97 for the FD and .94 for the H index scores (Hammer & Spiker, 2018). The MHSIS had the strongest evidence of predictive validity in comparison to other help seeking measures, such as the GHSQ & ISCI.

Stigma

The D-D scale was originally developed by Link and colleagues (1989), and later adapted by Eisenberg et al. (2009). The measure was developed to examine perceived public stigma and personal stigma. The adapted version of the D-D scale contains 12 items that examine perceived public stigma and 3 items that examine personal stigma. Sample items for perceived public stigma include, "Most employers will pass over the application of someone who has received mental health treatment in favor of another applicant" and "Most people in my community would treat someone who has received mental health treatment just as they would treat anyone." Sample items for personal stigma include, "I would willingly accept someone who has received mental health treatment as a close friend" and "I would think less of a person who has received mental health treatment".

Participants respond to the 15 items using a 6-point likert scale ranging from 0 (*strongly agree)* to 5 (*strongly disagree*). An average score is calculated for the 12 perceived public stigma items and for the 3 personal stigma items. High numbers reflect higher perceived and personal stigma, respectively.

The adapted version of the D-D scale scores yielded high internal reliability for perceived public stigma subscale (Cronbach's $\alpha = .89$) and for the personal stigma subscale (Cronbach's $\alpha = .78$). (Eisenberg et al., 2009)

Mental health Checklist

The Mental Health Checklist (MHCL) is a self-report questionnaire that was developed to examine psychological health in stressful environments and extreme conditions (Alfano et al., 2021; Bower et al.,2019). The MHCL contains 23 items that are divided

into three subscales: positive adaptation, poor self-regulation, and anxious apprehension. Example items include “determined”, “forgetful”, “inattentive”, and “racing thoughts”. Participants respond to the 23 items using an 11-point Likert-type scale ranging from 0 (“*never*”) to 10 (“*always*”)

In a prior study the MHCL was used to examine psychological health during periods of isolation or confinement among a sample of 359 U.S. and U.K adults. The MHCL scores demonstrated good internal consistency for all three subscales (α's ranged from .78 to .90; So et al., 2022). The MHCL scores also demonstrated convergent validity as it correlated a measure of depression and anxiety and a measure of insomnia.

Results

For the main analyses of this study a series of multiple regressions were conducted. The results are presented according to the study’s research questions.

Research Question 1: What is the relationship between acculturation, ethnic identity, familism, and perceived social class and intentions to seek mental health services? Using SPSS, a multiple regression was calculated to predict intentions to seek mental health services based on the cultural variables, acculturation, ethnic identity, perceived social class, and familism. The regression weights and p-values are displayed in Table 5. A nonsignificant regression equation was found ($F(6,220) = 1.58$, $p > .05$), with an R2 of .04. Acculturation (AOS) (β = -0.03, $p = 0.67$); enculturation (MOS) (β =-0.12, $p = 0.11$); ethnic identity (β = 0.11, $p = 0.16$); familism (β =-0.08, $p = 0.22$); social class (USA) (β = 0.10, $p = 0.19$), and social class (community) (β = 0.03, $p = 0.66$) were not significant predictors of help seeking intentions. Thus, the cultural variables were not significant predictors of intentions to seek mental health services.

Table 5. Regression Table: Help Seeking Intentions

Help Seeking Intentions	*B*	*SE B*	β	*t*	*p*
Constant	4.30	1.38		3.12	<.001
Acculturation (AOS)	-0.10	0.24	-0.03	-0.42	0.67
Acculturation (MOS)	-0.22	0.14	-0.12	-1.60	0.11
Ethnic Identity	0.37	0.26	0.11	1.41	0.16
Familism	-0.11	0.09	-0.08	-1.23	0.22
Social Class (USA)	0.11	0.08	0.10	1.32	0.19
Social Class (Community)	0.03	0.07	0.03	0.44	0.66

Research Question 2: What is the relationship between stigma, help seeking attitudes, and mental health well-being, and intentions to seek mental health services?

Using SPSS, a multiple regression was calculated to predict intentions to seek mental health services based on the attitudinal variables, stigma, help seeking attitudes, and mental health well-being. The regression weights and p-values are displayed in Table 1. A significant regression equation was found ($F(7,218) = 7.39$, $p < .05$), with an R2 of .19. Personal stigma (β = -0.04, p = 0.55) and public stigma (β = -0.04, $p = 0.52$) were not a significant predictor of help seeking intentions. However, help seeking attitudes was a significant predictor of help seeking intentions (β = 0.34, $p < .001$). Also, mental health well-being was a significant predictor of help seeking intentions (β =1.34, $p = 0.05$). Collectively, attitudinal variables (i.e., help seeking attitudes and mental health well-being) were significant predictors of help seeking intentions.

Table 1. Regression Table: Help Seeking Intentions

Variable	*B*	*SE B*	β	*t*	*p*
Constant	1.40	0.85		1.65	0.10
Personal Stigma	-0.11	0.17	-0.04	-0.61	0.55
Public Stigma	-0.09	0.15	-0.04	-0.64	0.52
Help Seeking Attitudes	0.48	0.09	0.34	5.34	**<.001**
Mental Health Checklist	1.83	0.92	1.34	1.99	**0.05**

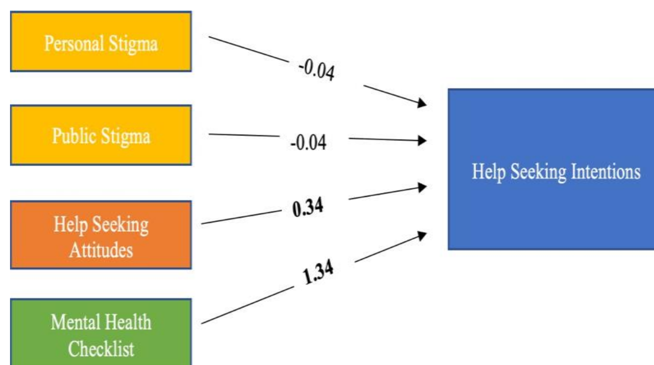

Figure 1. Standardized regression weights of the attitudinal variables on help seeking intentions.

Research Question 3: What is the relationship of these cultural variables with help seeking attitudinal variables?

Using SPSS, a multiple regression was calculated to predict personal mental health stigma based on the cultural variables, acculturation, ethnic identity, familism, and perceived social class. The regression weights and p-values are displayed in Table 2. A significant regression equation was found ($F(6,220) = 3.88$, $p < .05$), with an R2 of .096. Acculturation (AOS) ($\beta = 0.03$, $p = 0.67$); enculturation (MOS) ($\beta = -0.14$, $p = 0.06$), and ethnic identity ($\beta = 0.02$, $p = 0.82$) were not significant predictors of personal mental health stigma. However, familism was a significant predictor of personal mental health stigma ($\beta = 0.19$, $p = <.001$). Also, social class (USA) ($\beta = -0.16$, $p = 0.04$) and social class (community) ($\beta = 0.28$, $p = <.001$) were significant predictors of personal mental health stigma. Although cultural variables were not significant predictors of help seeking intentions, familism, social class (USA), and social class(community) were significant predictors of personal mental health stigma.

Table 2. Regression Table: Personal Stigma

Variable	*B*	*SE B*	β	*t*	*p*
Constant	0.81	0.50		1.62	0.11
Acculturation (AOS)	0.04	0.09	0.03	0.42	0.67
Acculturation (MOS)	-0.10	0.05	-0.14	-1.90	0.06
Ethnic Identity	0.02	0.10	0.02	0.23	0.82
Familism	0.10	0.03	0.19	2.97	**<.001**
Social Class (USA)	-0.06	0.03	-0.16	-2.11	**0.04**
Social Class (Community)	0.10	0.03	0.28	3.70	**<.001**

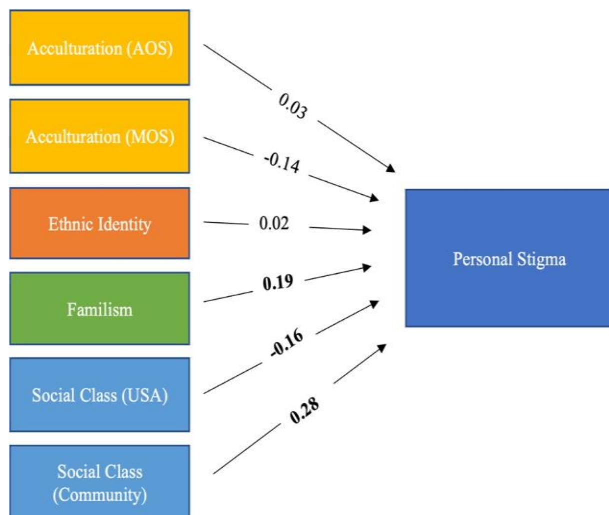

Figure 2. Standardized regression weights of the cultural variables on personal stigma

Discussion

This study explores the relationship between attitudinal variables (i.e. stigma) and cultural variables to Latinx college students' mental health help seeking intentions. Findings help to extend the limited research conducted with Latinx communities by focusing solely on Latinx college students.

The findings suggested that the cultural variables (acculturation, ethnic identity, familism, and perceived social class) did not have significant effects on help seeking intentions. However, the cultural variables (familism and perceived social class on a national level) were significantly related to the attitudinal variables. In addition, the attitudinal variables (help seeking attitudes and mental health well- being) were significantly related to help seeking intentions.

The findings suggested that low perceived social class on a national level was negatively related to high levels of personal mental health stigma. This means that individuals that are of a lower social class are at a high risk for possessing personal mental health stigma. However, high perceived social class on a community level was positively related to high levels of personal mental health stigma. Reasons for this variation could be attributed to participants viewing an extensive gap between social classes on a national level and not on a community level. Other cultural variables, such as familism, suggest that high levels of familism were positively related to high levels of personal mental health stigma. The finding suggests that putting one's family before oneself contributes to high levels of personal mental health stigma. Attitudinal variables, such as help seeking attitudes, suggested that positive attitudes about mental health help seeking were positively related to high intentions to seek mental health help. Lastly, positive self-reported mental health attributes were positively related to high intentions to seek mental health help.

This study aligns with prior research concerning familism. A study reported that familismo was brought up by 73% of participants; family influence was brought up by 80% of participants. Familismo could lead to patients covering up their symptoms or their illness severity to protect their family and not burden them. Researchers concluded that familismo and family influence could be related to treatment supportive or treatment discouraging influences on Latinos with depression (Martinez et al., 2013). That study describes both positive and negative relationships between

familism and mental health help seeking. Researchers noted reports of participants not wanting to burden their families or wanting to protect their family due to the high value of familism. The results of that study partially align with this study as high levels of familism were related to high levels of personal mental health stigma

This study does not align with prior research concerning socioeconomic status. Another study reported that high socioeconomic status was associated with greater levels of mental illness stigma that were mediated by personal responsibility judgment and controllability attributes (Foster & O'Mealey, 2022). These results do not align with the results of this study because low perceived social class on a national level was related to high levels of mental health stigma.

Implications

Psychoeducation with Latinx families is the first step to destigmatizing mental health within the community. There is a need to educate Latinx families on the importance of having conversations with their children about mental health. Having these conversations early on with children will help to generate positive attitudes towards mental health and decrease stigmatization.

When considering psychological practice with Latinx college students, mental health professionals should assess for familism values and social class on a national level. High familism values and low social class on a national level are associated with high levels of personal mental health stigma.

This study demonstrates a need for advocacy for mental health at universities and colleges.Universities should spread awareness of mental health campus and community resources, create support groups for Latinx identifying individuals, as well as create university presentations that discuss the importance of mental health. Universities should also target mental health campaigns for Latinx college students that are less likely to seek mental health help.

Limitations

This study used an anonymous Qualtrics survey to collect data. Using a survey to collect data allows participants to provide possible dishonest answers that are not a true reflection of themselves. Participants may also feel inclined to respond in a socially acceptable manner. This study did not examine all possible cultural variables (i.e., religion and language barriers). Other cultural variables may influence help seeking intentions or personal mental health stigma. Lastly, this study did

Future Directions

Possible future directions for this study could include examining structural variables influence on help seeking intentions, conducting interviews, as well as exploring possible generational differences influence on help seeking intentions. Exploring structural variables (i.e., finances) could also demonstrate other barriers to help seeking for Latinx college students. Conducting interviews would allow for the research team to explore the factors that influence help seeking intentions in-depth. Interviews will also allow the research team to view commonalities across participants' answers. Lastly, it would be interesting to explore possible generational differences in Latinx families and their effect on help seeking intentions. With growing awareness and presence of mental health advocacy on social media, recent generations' help seeking intentions may differ from earlier generations.

Conclusions

The findings of this study highlight the importance of the relationship of attitudinal variables and cultural variables to Latinx college students’ mental health help seeking. Marginalized college aged students are at risk for not seeking mental health help. It is important to understand the factors that affect help seeking intentions in order to create change for the future. With these findings this study intends to advocate for support for Latinx college students’ mental health and to destigmatize mental health in the Latinx community.

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Featured Scholar

Paulos Mengsteab, PhD
IChan School of Medicine at Mount Sinai
MD in 2023
2012-2013 MU McNair Scholar
PhD in Biomedical Engineering, University of Connecticut in 2019

The McNair Scholars Program was a formative experience in my academic journey. I still remember the day that I received an email advertisement from the Mizzou McNair Scholars Program for an informational session on the goals and structure of the program. I must admit that the stipend certainly caught my eye as a student working at both the library and a restaurat throughout my first two years at Mizzou. The idea of being paid to undertake an academic endeavor was foreign to me.

“Why do you want to become a biomedical engineer instead of a doctor?” asked Dr. Davis and Mr. Bloss during my interview. A great question that left me saying, “I want to provide doctors the tools that they do not already have.” I was inspired to pursue a Ph.D. in biomedical engineering due to my sports injuries and three anterior cruciate ligament (ACL) tears in 1.5 years. That experience begged me to ask, why did this occur? Even with that curiosity, it was not until I became a member of McNair that I became equipped with the tools needed to become a successful researcher and tackle such questions.

While a McNair Scholar, I was fortunate to work on an orthopedic-related project under Dr. Ahmed Sherif El-Gizawy in the Department of Mechanical Engineering. Under his guidance and Laurent Eap’s, my graduate student mentor, I learned the scientific method. This research experience provided me with what I missed most in my first three years at Mizzou, applying classroom knowledge. As the year went on, it became apparent that my calling was to become a scientist.

In addition to the in-lab experience, the McNair Scholars Program provided a robust research curriculum to equip us with the tools of a researcher. We learned how to perform a literature search, write a manuscript, prepare posters for a conference, and practice our presentation skills. Furthermore, we were exposed to the various scholarship opportunities for graduate school and pipeline programs designed to increase our competitiveness for graduate school. I also look back fondly on the dining etiquette class we took!

With the guidance of McNair, I was fortunate to be selected for the PREP at the University of Washington in Seattle. There I continued to build on my skills as a scientist under the mentorship of Dr. Deok-Ho Kim and had the opportunity to collaborate with international scientists from the National Institute of Materials Science in Tsukuba, Japan.

In 2019, I received my Ph.D. in Biomedical Engineering at the University of Connecticut, under Dr. Cato T. Laurencin, where I researched the regeneration potential of biodegradable ACL matrices for ACL reconstruction. Things indeed came full circle from those previous ACL injuries I had! Subsequently, I decided to pursue my MD. I am currently a third-year medical student at the Icahn School of Medicine at Mount Sinai – I guess I could never shake the question that Natasha and Jeremy previously posed to me, “why, not a doctor?”

What can I say besides how great the McNair program was for me! Indeed, there was a lot of hard work along the path to gaining my Ph.D. and entering medical school. Still, I believe it would not have been possible without the McNair Scholars Program exposing me to research as well as instructing me on the fundamentals of the scientific method. This program was the inception of my academic career as a biomedical researcher and now an aspiring physician. TRIO certainly works! I wish all the luck to the current and past McNair scholars at Mizzou and beyond!

2022-2023 Research Topics

Scholar	Major	Title	Mentor
Noura Alhachami	Psychology	Autism Spectrum Disorder, Camouflaging, and Skin Conductance Levels	David Beversdorf
Andrea Brown	Black Studies	Naming Myself: Afrofuturism and Black Twitter's Communal Response to Lovecraft Country's Black Women Protagonists	Christina Carney
Joi Cottle	Interior Design	Integrating Social Equity with Sustainable Design: Challenges Faced by Professionals	Laura Cole
Tevis Edmiston	Human Development and Family Sciences	Best Practices for Working with LGBTQ+ Survivors of Interpersonal Violence	Kale Monk
Maya Elste	Psychology	Relationship between Stigma and Cultural Variables to Latinx College Students' Willingness to Seek Mental Health Help	Lisa Flores
Ian Flowers	Psychology	The Influence of Social Network Drinking Behavior and a Family Histroy of Problematic Drinking on Alcohol Involvement in Underage, Emerging-Adult Drinkers	Bruce Bartholow
Gwenna Keckler	Political Science	The Effects of Foreign Aid and Political Stability on Economic Growth	Jonathan Krieckhaus
Michelle Le	Psychology	Mother-Adolescent Storytelling and Adolescent Development and Adjustment	Jordan Booker
Mable Lewis	Public Health	Skin Complexion in the Twenty-First Century: The Impact of Colorism on African American Women	Ginny Ramseyer-Winter
Luke Odo	Anthropology and International Relations	Racialization and Ethnogenesis Within the Japanese Empire	Dominic Meng-Hsuan Yang
Myia Ramos	Psychology	Influence of Volunteering for the "Look Around Boone" Social Media Campaign on Volunteers' Perceived Mental Health Self-Efficacy	Keith Herman

2022-2023 McNair Scholars

Group Photo of the 2022-2023 McNair Scholars

Top Row: Ian Flowers, Jeremy Bloss (Assistant Director), Luke Odo, Breyony Allen, Kennedy James, James Hamilton (Program Assistant), Mable Lewis

Second Row: Michael Ross, Noura Alhachami, Joi Cottle, Michelle Le, Gwenna Keckler, Jocelyn Lamore

Seated: Myia Ramos, Maya Elste, Dr. Natalie Downer (Director), Tevis Edmiston

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