
Published Biannually by
The Department of Counseling and Clinical Psychology
Teachers College, Columbia University

Spring 2023 – Volume 20

Graduate Student Journal of Psychology



The Graduate Student Journal of Psychology is a publication of the Department of Counseling and Clinical Psychology, Teachers College, Columbia University.

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Graduate Student Journal of Psychology

Spring 2023 – Volume 20

FORWARD

Letter from the Editors

Daniella Ekstein, Cassidy Iervasi, Catherine Shorb, Ellen Somers, Evelyn Tsai, Hannah Manley, and Lori Kim 4

ARTICLES

Prevalence, Comfort With, and Characteristics of Sex Toy Use in a US Convenience Sample using Reddit.com 5

Emily Fippen¹ and George Gaither², ¹ Teachers College, Columbia University; Department of Clinical & Counseling Psychology, ² Ball State University, Department of Psychological Science

Predicting Satisfaction With Life and Affect Balance Using Trait Interactions 26

Jacob R. Gibson¹, Chloe Pedersen-San Miguel², and Tera D. Letzring, ¹ 04 W. Washington St. Lexington, VA. 24450, ² Idaho State University; Pocatello ID, 83209

Bouncing Back: Resilience, Aggression, and Depression in Older Gay Men and Lesbians 49

Tosha Griggs, M.S. and Mark Vosvick, Ph.D., Counseling Psychology Department, University of North Texas, Denton TX

Educating College Students about Dating Violence Bystander Behaviors: Evaluating an Innovative Animated Intervention 75

Micah Herman¹ and Karen M. O'Brien², ¹ University at Albany, ² University of Maryland, College Park

The Effects of Face Masks on Emotion Interpretation in Socially Anxious Individuals 88

Lexie M. Mathis, Department of Psychology, Towson University, Towson, MD

Autism Spectrum Disorder and Face Identity Recognition Deficit across Ages 99

Ye Song, Teachers College, Columbia University

The Impact of a Brief Humanizing Intervention on Prejudice Towards Transgender Individuals 127

Aya Touma Sawaya, M.A. Candidate and Megan K. McCarty, Ph.D, The Gwen Ifill College of Media, Arts and Humanities, Simmons University, Boston, MA

Understanding Migration and Resettlement Experiences of Uzbek Immigrants in the United States 153

Anastasiya Tsoy¹, Khanh T. Dinh¹, and Sharifa Djurabaeva², ¹ Department of Psychology, University of Massachusetts Lowell, ² Dennis-Yarmouth High School, MA

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LETTER FROM THE EDITORS:

The Graduate Student Journal is proud to present our latest volume, Volume 20. This volume comes as the second issue after a full re-launch of the journal, and our first full academic year releasing two volumes. With each additional volume release, we are proud to highlight the incredible work of our authors. Current students are the next generation of professionals and practitioners in the field of psychology. The journal continues to act as a meaningful bridge between graduate students and the world of professional publication. We are honored to share their work with our community.

Volume 20 includes articles relating to a number of unique research topics, specifically touching on the experiences of diverse populations. The journal's mission to prioritize diversity and inclusion is reflected in the content of the selected research articles. This includes LGBTQ+, neurodiverse, and immigrant populations. Some of the research topics addressed by our authors touch on resilience, reducing discrimination, dating violence, and immigrant experiences. Our authors present important implications for the field of psychology and beyond.

Our featured authors, peer-reviewers, and editorial board work tirelessly to bring our journal to life. With each new volume comes new challenges and opportunities to foster growth, which we could not meet without our faculty sponsor, Dr. Randall Richardson-Vejlgaard. We are immensely grateful for everyone's commitment to the journal's overall success. We look forward to continuing to grow this platform that highlights students' innovative research. We invite our readers to share their thoughts and comments with us at gsjp@tc.columbia.edu. You can also connect with us through social media (Instagram, Twitter, LinkedIn) @gsjp_journal.

The Editors,

Daniella Ekstein, Cassidy Iervasi, Catherine Shorb, Ellen Somers, Evelyn Tsai, Hannah Manley, and Lori Kim

Prevalence, Comfort With, and Characteristics of Sex Toy Use in a US Convenience Sample using Reddit.com

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Although Döring and Poeschl (2020) have presented findings on the use of a broader range of sex toys from a German national sample, little is known about the prevalence and characteristics of users of a broad range of sex toys in the United States. The present study aims to examine the prevalence, characteristics of, and comfort with sex toys among a sample of American adults ($n = 231$). Within this study, the term “sex toy” refers to any object used directly on the body (e.g., vibrator, dildo, handheld masturbator), while “sexual aids” refers to items that may enhance sexual pleasure or libido (e.g., lubrication, aphrodisiacs). We used survey data that was previously collected in 2020 using Reddit.com/r/SampleSize and Ball State University’s Communications Center to solicit participation. Using data from Döring & Poeschl (2020) to assess sex toy use, we added questions regarding participant comfortability using sex toys in the past. If the participant had never previously used sex toys but would be willing to do so in the future, we asked about the perceived comfort of using a sex toy. We also asked about the perceived positive and negative effects of toy use, as well as a number of possible predictors of use including personality, sexuality, mental health, and trauma-related experiences (sexual assault, sex problems/dysfunctions, being diagnosed with PTSD). Our findings revealed that a significant portion of Americans have previously used sex toys. Among our participants who have never used a sex toy, a significant portion said they would be willing to try doing so in the future. Future research could examine prevalence, comfort with, and characteristics of sex toy use among a more sexually and racially diverse sample. Implications for sexual health will be discussed in terms of the Positive Sexuality and Positive Technology frameworks.

Keywords: Sex toys, sexual aids, sexual dysfunction, sexual assault, convenience sampling

In 2020, the global sex toy market was valued at \$33.64 billion, more than double compared to the 2009 value of \$15 billion (Grandview Research, 2021). With the sex toy industry growing at an exponential rate, more people throughout the world are having differential experiences with sexually-enhancing technology. Sex toys are now sold in several commercial grocery stores, such as Walmart and Target, and can also be found within sex shops, various stores at shopping malls, and on countless websites. The proposed study aims to identify participants’ comfort levels and experiences with sex toys, as well as to identify levels of comfortability among participants who reported previous experiences with sexual assault, sexual dysfunction, and/or Post-Traumatic Stress Disorder (PTSD). Understanding how and why American adults use sex toys and sexual “aids” can allow for a better analysis of why sex remains a taboo topic within the United States, and can inform clinicians on how to best incorporate sex toys and sexual “aids” into therapeutic practice.

Sex toys, as defined by Döring and Poeschl (2020), are sexual enhancement products with the intent of improving the nature and quality of sexual experiences. Sex toys are material objects that are used directly on the body and include “sexual aids” such as lubrication, bondage, and lingerie. This operationalization of sex toys emphasizes pleasure and the en-

hancement of sexual experiences as it pertains to overall sexual health and satisfaction. Throughout this study, the terms “sex toys” and “sexual aids” may be used interchangeably, as the term “sexual aids” refers to “an object or device that is primarily used to facilitate human sexual pleasure” (Miranda et al., 2019).

In the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), a sexual dysfunction can be defined as “a clinically significant disturbance in a person’s ability to respond sexually or to experience sexual pleasure” (American Psychiatric Association, p. 423). In the United States, sexual dysfunctions affect approximately 43% of women and 31% of men (Rosen, 2000), some of which include hypoactive sexual desire disorder, erectile dysfunction, orgasmic disorder, and female sexual arousal disorder. It is noteworthy to mention that the diagnosis of hypoactive sexual desire disorder has changed with the newest edition of the DSM (DSM-V) and is now enveloped underneath an umbrella diagnosis titled ‘female sexual interest/arousal disorder’.

Currently, little is known about comfortability with toys, especially among individuals with sexual assault or sexual dysfunction-related issues. The present study aims to explore participants’ levels of comfortability with and use of various types of sex toys and sexual aids. Further, this study aims to identify

levels of comfortability with sexual aids among participants who report having ever experienced a sexual assault, sexual dysfunction, and/or PTSD. In addition to past and present sex toy usage, we asked participants about past experiences with sexual assault, PTSD, and religiosity, as well as perceived positive and negative effects of and comfortability with sex toys.

Literature Review

Sex Toys Trends

A plethora of research regarding sex toys and their users is not currently available, due to a lack of empirical studies. This lack of research may be informed by the consideration of many Americans that sex toys, and discussions of sex in general, are taboo. Many discussions about sexual behavior and sexual health are clouded by discomfort, awkwardness, and a negative stigma (Schwallie, 2020). However, a select few studies have been conducted, such as the research by Reece and his colleagues (2010), as well as by Döring and Poeschl (2020). These studies aimed to examine rates of sex toy and sexual aid use among singles and couples, what individual demographics influence people to consume these toys, and exactly what kinds of toys these groups are using. Further, these studies were conducted using nationally representative samples, which implies that there is a high level of confidence that the data can be generalized to the larger population.

Throughout the existing literature, it has been repeatedly found that women are the largest consumers of sex toys, especially vibrators, with queer women having the highest rates of use. It has been found in one sample that around 90% of women reported ever having used sex toys during partnered sex, masturbation, or both (Fahs & Swank, 2013). Approximately 37.3% of women reported ever having used a vibrator during partnered sexual intercourse, while 46.3% reported ever having used a vibrator during foreplay (Herbenick et al., 2009). 85% of women ($n = 889$) reported feeling comfortable using a vibrator alone while 69.6% reported that they feel comfortable using a vibrator with a partner (Herbenick et al., 2010). However, rates of sex toy use during solo masturbation vary by study, with Reece and his colleagues (2010) finding that 46.3% of women have ever used a vibrator alone during masturbation. Comparatively, in Döring and Poeschl's (2020) research, they found that 72% ($n = 366$) of

women – almost three-fourths, reported ever having used a toy designed to stimulate the vagina or vulva during solo sex. Rates of reporting may vary due to fear of judgment, social stigma, or sampling methods, as was reported by participants in Fahs and Swank's (2013) study. These studies indicate that many women, if not comfortable enough to incorporate sex toys into their solo and/or partnered activities, are at least familiar with different types of sex toys and their uses.

An important note to make regarding women's sex toy use is that attitudes and perceptions tend to vary based on sexual orientation, as demonstrated by the work of Fahs and Swank (2013). Their study examined rates of sex toy use by sexual orientation and found that nonheterosexual women reported less shame and expressed more desire to use toys with a partner, as these women tended not to place such an emphasis on phallocentrism and heteronormativity. Most of the heterosexual women, however, were more concerned about their partner's attitudes and opinions on their use of sex toys, and feared that their partner would feel sexually inadequate, despite many of these participants reporting that their partner had never expressed these concerns. Because nonheterosexual women tend to not place as much, if any, emphasis on sexual phallocentrism and heteronormativity, these women were better able to adopt a more playful connotation surrounding sex toys, both during solo and partnered sex. Both groups of women were found to vary in their expression of agency in reference to their relationship with and feelings about sex toys, particularly penetrative toys, as heterosexual women were more likely to believe that masturbating without penetrative toys was abnormal and a cause for concern, while nonheterosexual women did not hold this belief. The work of Fahs and Swank (2013) effectively distinguishes rates of sex toy use among American heterosexual and nonheterosexual women, as well as discusses how sex toys often carry a negative connotation when discussed within the confines of a heterosexual relationship.

Contrary to the popular belief that women use sex toys and sexual aids at higher rates, it has been found that rates of sex toy usage among men and women are similar, with 43.8% of men ($n = 423$) reporting that they had ever used a vibrator, either during solo or partnered sex (Reece et al., 2010). Comparatively, it was found by Döring and Poeschl (2020) that 34% of men ($n = 295$) reported ever having used sexu-

SEX TOY USE IN THE US

al aids designed for the stimulation of the penis and testicles, while 44% had ever used aids designed for the stimulation of the vulva and vagina. Interestingly, sex toy usage varies by partnership among men, as has been found in Reece's and his colleagues' (2010) research. Reece et al. (2010) found that men in partnerships were much more likely to report ever having used a vibrator during partnered sexual intercourse, with 43% of men in romantic partnerships and 38% of married men displaying this trend. Comparatively, only 21.3% of single men reported ever having used a vibrator during sexual intercourse with a partner. Approximately one-third of the sample ($n = 985$) reported ever having used a vibrator during masturbation alone. The work of Döring and Poeschl (2020) and Reece et al. (2010) indicate that sex toy use, particularly vibrator use, is common among heterosexual men, and is a phenomenon that should be studied further.

Similar to "sexual aid" research as a whole, there exists a lack of current research examining the rates and types of sex toy use among gay and bisexually identifying men. It has been found that, among gay and bisexual men ($n = 25,294$), nearly 80% report ever having used at least one type of sex toy (Rosenberger et al., 2011), including dildos (62.1%), vibrators (49.6%), butt plugs (34.0%), masturbation sleeves (27.9%), and anal balls or beads (19.3%). A commonly reported phenomenon among gay and bisexual men is inserting a toy, such as a butt plug or dildo, into one's own anus during masturbation (95.7%) or into their partner's anus (72.0%).

Types of Toys

Few existing studies have examined exactly what types of toys are being used by the overall population. In a study that aimed to examine the most used sex toys, as well as hygienic behaviors following their use, it was found that the most popular sexual aid is the vibrator, with 54.53% of people ($n = 1,435$) with a vulva and vagina reporting that they had ever used any sort of store-bought or homemade vibrator (Wood et al., 2017). Similarly, 21.26% of these people reported ever having used a dildo, and 9.26% reported using sexual toys related to BDSM (bondage, dominance, sadism, masochism), such as whips, anal beads, or devices used for restraint. Among heterosexual men, 52% ($n = 295$) have reported using sex toys designed for the stimulation of the penis and testicles, such as cock rings or handheld masturbators, within the past year during solo sex (Döring & Poeschl, 2020). Com-

paratively, 31% of men from the same sample reported using toys designed for the vagina and/or vulva, such as a vibrator, during solo sex within the past year. 26% of men reported ever having used toys for bondage or S&M (sadism and masochism), such as whips or cuffs, and 46% reported ever having used arousal-enhancing remedies, such as ingesting food or substances that elicit sexual desire (i.e., aphrodisiacs), during solo sex within the past year (Döring & Poeschl, 2020).

Sexual Aids as Treatment

Sexual aids are increasing in popularity as clinician recommended treatments for sexual dysfunctions, as well as for anxiety and fear following a sexual assault. Nearly all the existing literature on sexual aid recommendation focuses on cancer-related sexual dysfunctions, which result from radiation targeted at the pelvis and surrounding areas. When radiation targets the pelvic area, it may damage nerves and arteries necessary for sexual functioning (American Cancer Society, 2020). Sexual aids have recently been utilized for rehabilitation, as they may serve to increase sensitivity, functioning, and pleasure among cancer patients. However, as discovered by Bober and his colleagues (2019), the majority of cancer survivors do not receive adequate support or education about sexual health. While exact statistics vary regarding sexual dysfunction as a side effect of cancer treatment, it has been found by Andersen (1985) that 20 to 90 percent of adult cancer patients suffer from significant sexual dissatisfaction or dysfunction. However, among these various cancer-treatment centers, only 27% offer sexual aids and rehabilitation for women, while even fewer (13%) offer the same aids for men (Bober et al., 2019). Sexual aids, while serving to increase pleasure and intimacy among couples, can also serve as a form of rehabilitation for individuals suffering from sexual dysfunctions resulting from sexual assault, PTSD, and cancer-related treatments. Further, physicians and clinics should make sexual rehabilitation in these instances more accessible to increase sensitivity and functioning among those with sexual dysfunctions.

Sexual Dysfunction

It has been found that sexual dysfunctions are common within the United States, affecting approximately 43% of women and 31% of men (Rosen, 2000). Among these sexual dysfunctions, hypoactive sexual desire is most common among women, with about 30% of the female population meet-

ing the diagnostic criteria. Erectile dysfunction is the most common sexual dysfunction among men, and rates vary due to the prevalence of this dysfunction growing exponentially with age (Rosen, 2000).

Sexual dysfunctions have a variety of causes and may only arise during certain situations or circumstances. Common psychological causes for sexual dysfunction include stress, anxiety, and depression (Beaumont Health, 2023). It has been found that when performance-related demands were placed on both sexually functioning and sexually dysfunctional men, the sexually dysfunctional men had lower levels of sexual arousal due to becoming distracted by the demand and the accompanying performance-related concerns (Barlow, 1986). Sexually dysfunctional men from the same study also reported that they perceived themselves as having less control over their sexual arousal than sexually functional men, even when levels of erectile response were the same. Current literature outlines how sexual dysfunctions can have a strong influence on sexual confidence, anxiety, and the sense of control one feels over their sexuality.

Further, some common physiological causes for sexual dysfunction include neurological disorders, various prescription medications, alcohol and drug abuse, cancer and related treatments, and sexual assault (Beaumont Health, 2023). Selective serotonin reuptake inhibitors (SSRIs), a medication commonly prescribed for depression, are commonly known as having adverse side effects, particularly in that they can contribute to the development of sexual dysfunction (Jing & Straw-Wilson, 2016). While the exact cause of sexual dysfunction as a side effect of SSRIs is not known, researchers have identified that it is the reuptake process of particular neurotransmitters, such as serotonin or norepinephrine, that influence the emergence of sexual dysfunctions (Prabhakar & Balon, 2017). The effects of SSRIs on sexual functioning have been researched, and it has been found that around 40 to 50 percent of both men and women experience reduced levels of sexual arousal when taking an SSRI (Balon, 2006). In relation to cancer, sexual dysfunctions arise when radiation targets areas surrounding the pelvis, such as the prostate, rectum, colon, or ovaries. Further, the psychological implications that may arise from enduring cancer treatments may contribute to lasting sexual dysfunctions, such as body dysmorphia resulting from hair loss or a change in weight (Archangelo et al., 2019).

The treatment of sexual dysfunctions today originates largely from the work of Masters and Johnson, who became pioneers of sex therapy after the creation and effective execution of sensate focus exercises in 1980 (Auteri, 2014). Sensate focus is a technique used to improve communication between partners regarding sex, reduce sexual performance anxiety, and shift away from goal-oriented expectations toward a more intimate and partner-focused experience (SMSNA, 2023). These sessions of non-demanding, sensual touching can increase comfortability with receiving touch from a partner. When exercised alone, this self-exploration can help an individual reclaim their sensuality and confidence. Sensate focus is commonly used for dysfunctional problems such as female sexual interest/arousal disorder, erectile dysfunctions, and male hypoactive sexual desire disorder. Other commonly used treatments involve hormone therapy, cognitive-behavioral therapy (CBT), medications, and mechanical aids such as penile implants (Cleveland Clinic, 2020).

One increasingly common treatment recommendation by sex therapists involves the incorporation of sexual aids or sex toys into masturbatory and partnered sexual activities. Sex toys may increase sensitivity and pleasure, and may also help to alleviate anxiety and fear among individuals who have been sexually assaulted (Rullo et al., 2020). However, individuals with dysfunction and/or sexual assault-related histories may be less inclined to use a sexual aid, either alone or with a partner, due to anxiety and fear surrounding sexual behaviors and sensual intimacy (Kaplan, 1974). Appropriate discussions between a client and their clinician are necessary to help determine what aids would be the most beneficial, as well as to determine how and when to use these particular aids. An increasing amount of literature is being made available to help guide the public in their sexual-aid endeavors, especially regarding dysfunction and sexual assault. For example, Rullo et al. (2020) posit that “there is no wrong way to use a vibrator. Patients should be encouraged to explore vibrator use all over the body, not just the genitals, and be reminded that vibrator use is for both men and women” (p. 7). These guidelines, and others like them, may help to increase comfortability with the use of sex toys and sexual aids.

Sexual Assault

According to the Rape, Abuse, and Incest National Network (RAINN, n.d.), sexual assault can be

SEX TOY USE IN THE US

defined as:

sexual contact or behavior that occurs without explicit consent of the victim. Some forms of sexual assault include: attempted rape, fondling or unwanted sexual touching, forcing a victim to perform sexual acts, such as oral sex or penetrating the perpetrator's body, [and] penetration of the victim's body, also known as rape.

Rates of sexual assault among women is a topic that has been highly researched, with previous findings indicating that upwards of 20 to 30 percent of women have experienced rape or attempted rape at least once during their lifetime (Koss, 1993, as cited in Ullman & Brecklin, 2002). Sexual assault is the least reported violent crime, with less than one-third of sexual assaults being reported to law enforcement (RAINN, n.d.). Reasons for not reporting an assault may include fear of retaliation by the perpetrator, a belief that law enforcement won't succor the situation, or a belief that the incident wasn't severe enough to report. The reporting of a sexual assault is less frequent among male victims, as men may be reluctant to report instances of sexual assault due to a widespread societal belief that men are perpetrators, not victims, or due to the belief by the victim that the incident was not actually assault (Ullman & Brecklin, 2002). Further, a common physiological response to anxiety or fear is sexual arousal, and many instances of sexual assault are discounted legally because the victim retained an erection and/or experienced ejaculation during the assault (Bullock & Beckson, 2011). Regardless of reporting status, experiencing a sexual assault has been found to be highly correlated with a decline in mental health (Ullman & Brecklin, 2002), as well as the development of post-traumatic stress disorder (PTSD). Sexual assault may lead to serious mental and physical health complications and can contribute to the development of a sexual dysfunction. Further, various assault-related factors, such as the severity of the assault or perceived level of social support, can influence the severity and duration of implications following the assault.

According to the CDC (2021), nearly one in five American women are victims of attempted or completed rape, and one in three female rape victims first experienced an assault between the ages of 11 and 17. Additionally, it is estimated that around 30% of current PTSD diagnoses were a direct result of sexual as-

sault or sexual violence (Texas A&M Health, 2019). Following an assault, common responses among women include panic attacks, flashbacks, depression, sexual dysfunctions, anxiety, and phobias, as well as an increase in overall anger, fear, guilt, and alcohol and drug abuse (US Department of Veterans Affairs, n.d.). Currently, cognitive-behavioral therapy (CBT) is the most common form of psychotherapy used to treat individuals dealing with psychological problems, such as dissociation or PTSD, following a sexual assault. Many treatments have been empirically proven to improve individual symptoms dependent from PTSD, such as anxiety and depression, these treatments are often incorporated into a multifaceted treatment plan. Recently, treatment plans began recommending the use of sexual aids, as "vibratory stimulation of the genitals is an evidence-based treatment" (Rullo et al., 2020, p. 2) for many sexual dysfunctions, including hypoactive sexual desire in men and female sexual interest/arousal disorder. Through the process of psychotherapy, victims of sexual assault are helped to recognize and target their feelings about the assault, and to increase their levels of self-confidence and comfortability.

Experiencing a sexual assault may result in sexual dysfunction or related issues, such as post-traumatic stress disorder (PTSD). Current treatments for individuals suffering from psychological afflictions following a sexual assault include cognitive-behavioral therapy (CBT), sensate focus exercises, the prescription of SSRIs, and individual and/or couples' therapy (Falsetti & Bernat, 2000). It has been determined by previous research that psychotherapy is necessary to restore declining mental health following a sexual assault (Kaplan, 1974). Additionally, research suggests that using sex toys or aids is beneficial in overcoming physiological implications following an assault, such as dysfunction issues and their accompanying psychological implications.

The Present Study

Previous literature has briefly examined sex toy and sexual aid use, as well as explored demographic trends for each. However, the literature fails to examine levels of comfortability among individuals, as well as potential willingness regarding sex toy use. The present study aims to expand on the conversation held by Herbenick and her colleagues (2010) regarding participant comfortability with sexual aids in solo

and partnered sexual behaviors. Further, no current research exists on the correlations among sexual assault, sexual dysfunction, PTSD, and sex toy and sexual aid use. The present study aims to fill these gaps by asking participants about their previous experiences using and researching sex toys, their levels of comfortability or willingness regarding these toys, and how levels of comfortability may be influenced by a previous history of sexual assault, dysfunction, and/or PTSD. Understanding American adults' comfortability and willingness to use sex toys can potentially provide insight into why sex remains a taboo topic within the United States, how to best introduce sex toys into one's sexual practices, and how to incorporate sex toys and sexual aids most comfortably into sexual assault and dysfunction related treatments. The present study was influenced by the work of Döring and Poeschl (2020), as their study introduced an important aspect of participants' sexual ideology by asking participants about their self-perceived positive and negative effects, giving valuable insight into rates and trends regarding sex toy usage. Data provided by the participants of this study will be analyzed in accordance with the Positive Sexuality and Positive Technology frameworks.

The Positive Sexuality framework views sexuality through a pragmatic yet multidisciplinary lens while addressing the full range of positive and negative implications that arise from engaging in sexual behavior. By analyzing sexuality through a positive framework, socially negative sexual stigmas can be avoided, and sexuality can be understood as a means of individuality, interrelationship strengthening, pleasure, and peacemaking (Williams, 2015). Further, this framework acknowledges the risks and negative consequences that can accompany sexuality and sexual behavior. To combat these negative implications, the Positive Sexuality framework emphasizes education and communication as a means of understanding.

The Positive Technology framework views technology as a means of "fostering personal growth and individual integration in the sociocultural environment, by promoting satisfaction, opportunities for action, and self-expression" (Riva et al., 2012, p. 69) Technology, in some capacity, can influence and enhance nearly every constituent of human experiences and overall functioning. Further, this framework considers sexual aids to be not only devices used for pleasure, but also therapeutic aids that can help to reduce

sexual anxieties, physical pain, sexual dysfunctions, and the accompanying implications that these factors may have on sexual functioning. In combination with the Positive Sexuality framework, sex toys and sexual aids can be viewed as a technological innovation that could potentially help millions of people become more comfortable with their bodies and sexualities.

Purpose and Hypotheses

The purpose of this study is to better understand the prevalence of Americans' sex toy and "sexual aid" use through the lenses of the Positive Sexuality and Positive Technology frameworks. The following hypotheses were generated:

Hypothesis 1: Women will report higher rates of sex toy and sexual aid usage than men, as found by Döring & Poeschl (2020).

Hypothesis 2: Compared to men, women will report higher usage of sex toys designed to stimulate the vulva and vagina, and lower usage of sex toys designed to stimulate the penis and testicles, during only masturbatory behavior, as found by Döring & Poeschl (2020).

Hypothesis 3: Among participants who report that they have never used a sex toy but would be willing to, there will be no significant difference between men and women in levels of willingness to use sex toys.

Hypothesis 4: Women will report more comfort using and researching sex toys than men.

Hypothesis 5: Among women, the most used sex toys will be toys designed for stimulation of the vagina and vulva, as found by Wood et al. (2017).

Hypothesis 6: Among men, the most used "sexual aid" will be toys designed to stimulate the penis and testicles.

Hypothesis 7: Participants with a history of sexual assault will be less likely to report using sex toys and sexual aids for both solo and partnered sexual activity.

Hypothesis 8: Regarding sexual assault and sex toy use, there will be a gender effect such that women who report having experienced a sexual assault will be significantly less likely to have used toys than those who haven't. However, there will be no difference in sex toy usage between men who have and have not been sexually assaulted.

Hypothesis 9: Regarding sexual dysfunction and sex toy use, there will be a gender effect such that men who report having experienced a sexual dysfunction will be significantly more likely to have used toys than those who haven't. However, there will be

SEX TOY USE IN THE US

no difference in sex toy usage among women who have and have not experienced a sexual dysfunction.

Method

Participants

The data collected by Dr. Gaither and his students was obtained largely through Reddit, using convenience sampling. A total of 311 participants entered the survey, while 231 fully completed the survey, as some participants exited the survey early. The only exclusion criterion for this study included being under the age of 18. Participants of this study ($n = 231$) were between the ages of 18 and 71 ($M = 24.89$, $SD = 8.59$). Slightly over two-thirds of participants were women (68.3%, $n = 224$), compared to 26.5% of the participants being male ($n = 87$). For racial demographics, 82.9% of participants were Caucasian ($n = 272$), 3.4% were Hispanic ($n = 11$), 3.0% were Asian ($n = 10$), 2.4% were African American ($n = 8$), 1.4% were Latinx ($n = 4$), 0.3% were Pacific Islander or Native Hawaiian ($n = 1$) and 4.9% reported being of another race not listed ($n = 16$). Most participants identified as heterosexual (63.7%, $n = 209$), while 18.0% identified as bisexual ($n = 59$), 3.7% identified as gay ($n = 12$), 4.0% identified as lesbian ($n = 13$), 3.7% identified as pansexual ($n = 12$), 2.4% identified as asexual ($n = 8$), and 2.4% identified as another sexual orientation not listed ($n = 8$). When asked about levels of religiosity, 48.5% of participants reported that they were not at all religious ($n = 159$). Similarly, 25.0% reported that they were slightly religious ($n = 82$), 15.9% reported that they were moderately religious ($n = 52$), 7.3% reported that they were very religious ($n = 24$), and 1.2% reported that they were extremely religious ($n = 4$).

When asked, “have you ever been sexually assaulted?” 34.5% of participants responded with yes ($n = 113$). When participants were asked “have you ever been diagnosed with Post-Traumatic Stress Disorder (PTSD)?”, 9.5% of participants responded with yes ($n = 31$). When asked, “have you ever had problems functioning sexually?”, 32.0% of participants responded with yes, I have had some problems with functioning sexually, but have never been officially diagnosed with a sexual dysfunction ($n = 105$), while 2.4% responded with yes, I have been diagnosed with at least 1 sexual dysfunction in my life ($n = 8$). There was no incentive provided to participants for completing the survey.

Measures/Materials

Participants completed a survey that contained several subscales within it. As part of a larger study, participants completed several items that included demographics, comfort, use of toys, experiences with assault and dysfunction, and measures of personality. Questions regarding specific variables (e.g., previous experiences using sex toys, sexual assault, sexual dysfunction, etc.) were concise and straightforward to make sure participants fully understood each item. This study will not explain all variables utilized in the survey and will only explain relevant variables. Variables excluded from the analysis and discussion include satisfaction and personality. Self-perceived positive and negative effects, while not part of the initial analysis, will be explored more in the discussion section.

Sociodemographic Characteristics

The first set of items were demographic items including age, race, gender, sexual orientation, birth country, and levels of religiosity. Experience with sexual assault was assessed with single item (“Have you ever been sexually assaulted?”), with response options of yes and no.

Use & Comfort with Use of Sex Toys

The next section of the survey asked participants about their previous experience with sex toys and sexual aids. Items asked participants about their previous experience with sex toys, if they had ever researched a sex toy, what sex toys they had previously used, levels of comfortability with using and researching sex toys, comfortability with attending a sex toy party, and perceived positive and negative effects of using a sex toy.

Examples of survey items include “have you ever looked into, or researched sex toys?” and “have you ever used a sex toy for masturbation?” with response options of yes, no but I would be willing to do so in the future, and no and I cannot see myself ever doing so. If respondents answered yes, they were taken to a follow-up question that asked, “How comfortable were you when you researched sex toys (or when you used a sex toy for masturbation)?”. Response options for comfortability items utilized a 7-point Likert scale, which ranged from extremely comfortable (1) to extremely uncomfortable (7). If respondents answered no but I would be willing to do so in the future, they were taken to a follow-up question that asked, “How comfortable do you think you would be if you were to research sex toys (or if you were to use a sex toy for masturbation)?” Response options

for expected comfortability ranged from extremely comfortable (1) to extremely uncomfortable (7). If respondents answered no and I cannot see myself ever doing so, no item regarding comfortability was presented. For comfort items, higher numbers within the data indicate lower levels of comfortability.

Sexual Dysfunction

The next section of the survey, which had three items, asked about participants' previous history with sexual dysfunction. Present survey items were based on items from the 1992 National Health and Social Life Survey, which aimed to better understand Americans' various sexual practices, as well as the surrounding life circumstances and social contexts in which these practices occur. An example of one of the survey items includes "have you ever had problems functioning sexually or been diagnosed with a sexual dysfunction?" with response options including no I have never had any problems functioning sexually, yes I have had some problems with functioning sexually, but never been officially diagnosed with a sexual dysfunction, and yes, I have been diagnosed with at least 1 sexual dysfunction in my life. If respondents answered this item with anything other than no I have never had any problems functioning sexually, they were taken to a follow-up question, also modeled from the NHSL, that asked about the specific sexual dysfunction that the respondent has experienced. Respondents were asked to report on whether they have experienced lacking desire for sex, arousal difficulties, inability achieving climax or ejaculation, anxiety about sexual performance, climaxing or ejaculating too rapidly, physical pain during intercourse, and not finding sex pleasurable. For each of these dysfunctions, respondents were presented with response options of yes and no.

Procedure

Recruitment ads for the study (i.e., convenience sampling) were posted on reddit.com/sampleize and on the Ball State University Communications Center during the Fall of 2020. People who were interested in participating clicked on a link to the anonymous survey which began with a study information and consent page. Those who did not click "I agree" were skipped to the end of the survey; otherwise, they entered the survey. The first question asked for age; anyone who typed in a number less than 18 was skipped to the end of the survey. Those who remained in the survey answered questions about demographics, ex-

periences and comfort with sex toys from a variety of perspectives (e.g., ever researched toys, used them, bought them, attended a party, etc.). Participants also completed items regarding whether they had ever been sexually assaulted, diagnosed with PTSD, experienced problems in sexual functioning, or been diagnosed with a sexual dysfunction. They completed short forms of the Openness and Extraversion subscales of the Big Five Inventory, the behavioral subscale of the SocioSexual Orientation Inventory, and the Sexual Esteem subscale of the Sexuality Scale. Finally, participants completed items regarding their relationship and sexual satisfaction, as well as their perceived effects of sex toy use. Once participants reached the end of the survey, they were thanked for their participation.

The data was analyzed using SPSS software. A series of frequency tests, chi-square, one-way ANOVAs (cross tabulations), and independent samples t-tests were conducted to examine the data and to compare with the generated hypotheses. Frequency tests were used to analyze demographic information and to obtain the frequencies of the number of participants for individual items. The chi-square crosstabs were used to better uncover the correlation between specific variables, such as sex toy use and previous experiences with sexual assault. Crosstabs were used to analyze means between various groups of conditions, such as between male and female sex toy users who either have or have not been sexually assaulted. T-tests were used to measure the means between two groups regarding various items, such as measuring the mean comfort level when using a sex toy during masturbation among individuals who report that they have or have not dealt with sexual functioning issues. Significance levels were adjusted using the Bonferroni correction method to attribute for running multiple analyses

Results

Acquisition of Sex Toys

Both male and female participants of this sample ($N = 231$) were overall well acquainted with sex toys and sexual aids. A series of frequency tests were run, split by gender, to better understand the prevalence of participants' acquisition on each item. 84.2% of all participants reported that they had ever researched or looked into sex toys, and 80.4% said that they had looked at sex toys in an online shop. 41.8% of participants had ever spoken to someone else about sex

SEX TOY USE IN THE US

toys, and 17.7% had ever received a sex toy as a gift. A majority of the sample (69.8%) had ever bought a sex toy themselves. A series of crosstabs were also run to determine statistical significance regarding the acquisition of sex toys between the genders. Overall, there was no significant difference between men and women on measures of acquisition of sex toys, except for items that asked about sex toy parties. There were no men within the sample that reported ever being invited to a sex toy party or ever hosting a sex toy party. Because none of the men reported that they had ever been invited to attend a sex toy party, they were not shown the follow-up question "Have you ever attended a sex toy party that someone else hosted?" However, 13.8% of male participants who reported that they had never hosted a sex toy party also reported that they would be willing to host a party in the future ($p = .002$, see Table 1). Among female participants ($n = 224$), 63.7% reported that they had ever attended a sex toy party, and 5.5% reported that they had hosted a sex toy party.

Sex Toy Use, Comfort, & Willingness in Solo Sex

Sex toy use was analyzed by running a series of crosstabs to determine statistical significance during masturbation between the genders. All percentages regarding sex toy use, comfort, and willingness in solo sex can be found within Table 1. Most participants (70.4%) reported that they had ever used a sex toy during solo sex, while 19% reported that they had not yet, but would be willing to do so in the future. Women reported using sex toys more than men during masturbation, with 76.1% of women reporting ever having used a sex toy during solo sex, compared to 63.1% of men ($p = .04$, see Table 1). This finding provides support for the first hypothesis. Among women, the most used sex toys and sexual aids during masturbation included toys designed for the stimulation of the vagina and vulva (69.2%), lubricants (42.9%), and erotic lingerie (22.8%). Among men, the most used sex toys and sexual aids during masturbation included lubricants (47.1%), toys designed for the stimulation of the penis and testicles (42.5%, $p < .001$, see Table 2), and toys designed for the stimulation of the vagina and vulva (26.4%). Although a notable number of men reported having used toys designed for the stimulation of the vagina and vulva, women were significantly more likely to use these same toys during masturbation ($p < .001$, see Table 2), and this provides support for the second hypothesis. Percentages

regarding specific sex toys can be found in Table 2.

An independent samples t-test, split by gender, was run to determine the means of comfortability regarding sex toy use during solo sex for each item, with lower means representing higher levels of comfortability. Women largely reported being slightly more uncomfortable ($M = 1.70$, $SD = 1.17$, $d = -.05$) when having used a sex toy during masturbation compared to men ($M = 1.64$, $SD = 1.19$; see Table 3). Overall, there were no significant differences between men and women on items of comfort, except that men reported feeling significantly more comfortable, $t(153) = -2.32$, when researching a sex toy ($M = 2.09$, $d = -.29$, $p = .022$) compared to women ($M = 2.51$, see Table 3). These findings are directly contradictory to the fourth hypothesis. Overall, men reported higher comfort with all items relating to acquisition (e.g., research, talking to others, purchasing, receiving a toy as a gift), as well as use during masturbation and partnered sexual activity. These data could be skewed by the disproportionate number of women to men, but the women within this sample consistently reported slightly higher levels of discomfort than the men on all measures.

A series of crosstabulations were run to determine statistical significance among participants who have never used a sex toy during masturbation but would be willing to do so in the future. Among individuals who have never used a sex toy but would be willing to, there were no significant differences between men and women on willingness to use sex toys during masturbation, except that men reported significantly more willingness, $\chi^2(1) = 28.56$, to try toys designed for the stimulation of the penis and testicles than women ($p < .001$; see Table 1). This finding is directly contradictory to hypothesis three, which predicted no difference in levels of willingness between the genders. Trends reflect that men within this sample are more willing to try lubricants, remedies for enhancing arousal, and toys designed for the stimulation of the penis and testicles, whereas women are more willing to try erotic lingerie, toys designed for the stimulation of the vagina and vulva, and toys for bondage and S&M.

Sex Toy Use, Comfort, & Willingness in Partnered Sex

All percentages regarding sex toy use, comfort, and willingness in partnered sex can be found within Table 1. 46% of men and 55.4% of women reported ever having used a sex toy during partnered sexual ac-

tivity, which was analyzed through a series of crosstabulations. Although there was no statistically significant difference among men and women for types of toys used during partnered sex, trends indicate that women are more likely to have used erotic lingerie (33.5%) and toys for stimulation of the vagina and vulva (46.9%) during partnered sexual activity within the past 12 months. Men and women were about equally likely to have used lubricants (35.6% of men vs. 40.6% of women), remedies for enhancing arousal (4.6% vs. 5.8%), toys designed for the stimulation of the penis and testicles (19.5% vs. 15.2%), and toys for bondage and S&M during partnered sexual activity (21.8% vs. 23.2%) within the same time frame. Percentages regarding specific sex toys can be found in Table 2.

Interestingly, trends indicate that men reported being more willing to try every sex toy listed during intercourse with a partner than women, as analyzed through a series of crosstabulations. There was a statistically significant difference in that men reported being more willing to try toys designed for the penis and testicles during partnered intercourse than women ($p < .001$). This data reflects that men and women are about equally as likely to try various sexual aids and sex toys during masturbation, other than toys designed for the penis and testicles, but that men are more willing than women to incorporate toys into partnered sexual activity. This finding challenges the dominant heteronormative belief that most men are against bringing sex toys into partnered sexual activities.

Sex Toy Use & Comfort Among Victims of Sexual Assault

All factors relating to the use and comfort of sex toys among victims of sexual assault were analyzed through a series of crosstabulations and independent samples t-tests. 13.8% of men within the sample reported ever having experienced a sexual assault, compared to 41.7% of women, as shown through a frequency analysis. Among men who reported ever having experienced a sexual assault, 81.8% reported ever having used a sex toy during masturbation, while 9.1% reported that they had not but would be willing to do so in the future. Among women who experienced an assault, 81.5% had ever used a sex toy during masturbation, while 15.2% reported that they had not but that they would be willing to do so in the future. It is noteworthy to emphasize that nearly an identical percentage of men and women who have been sexually assaulted

reported using a sex toy during masturbation (81.8% vs. 81.5%), and that men reported slightly higher rates of toy use during masturbation compared to women.

Among men who have been sexually assaulted, 63.6% reported ever having used a sex toy during partnered sex, while 36.4% reported that they had not but that they would be willing to do so in the future. None of the men who reported having been sexually assaulted reported that they would never be willing to try sex toys during partnered sex. Among women who have been sexually assaulted, 68.9% reported that they had ever used a sex toy during partnered sex, while 21.1% reported that they had not but that they would be willing to do so in the future.

Although not statistically significant, it is noteworthy to mention that trends indicate that both men and women who have been sexually assaulted are more likely to have used toys than those who have never been sexually assaulted, both during masturbation and sex with a partner. This finding directly contradicts the seventh hypothesis and slightly contradicts the eighth hypothesis in that there was no gender effect for sex toy use among those who have been sexually assaulted. However, both men and women who have been sexually assaulted also reported lower levels of comfortability during their previous experiences using sex toys. Among participants who have never been sexually assaulted, men reported more comfortability on all items. The reverse effect was found among participants who reported ever having experienced a sexual assault in that men reported much lower levels of comfortability than women who have been sexually assaulted. Among men who have ever used toys during masturbation, those who have been sexually assaulted reported much lower levels of comfortability ($M = 2.33$) than those who have never been assaulted ($M = 1.64$). Among women who have ever used sex toys during masturbation, those who have been assaulted reported only slightly lower levels of comfortability ($M = 1.76$) than those who have never been assaulted ($M = 1.70$). Among men who have ever used sex toys during partnered sex, those who reported ever having experienced a sexual assault reported much lower levels of comfortability ($M = 2.71$) than those who have never been assaulted ($M = 1.75$). Among women who have ever used a sex toy during partnered sex, those who reported ever having experienced a sexual assault reported only slightly lower levels of comfortability ($M = 1.95$) than

those who have never experienced a sexual assault ($M = 1.90$). The potential factors contributing to this phenomenon will be discussed in the discussion section.

Sex Toy Use & Comfort Among Those with Sexual Dysfunctions

Toy use and comfort among participants who have at least one sexual dysfunction were analyzed through a series of crosstabulations. 32.2% of men and 35.7% of women reported ever having experienced problems with sexual functioning, either with or without a formal diagnosis. Among men who reported ever having experienced a sexual dysfunction, 17% reported that they had ever used a sex toy during masturbation, while 5.0% reported that they had not but that they would be willing to do so in the future. Similarly, 17.5% of men in the same subsample reported that they had ever used a sex toy during partnered sex, while 11.8% reported that they had not but that they would be willing to do so in the future.

Among women who reported ever having experienced a sexual dysfunction, 45.2% reported that they had ever used a toy during masturbation, while 35.9% reported that they had not but that they would be willing to do so in the future. Similarly, half of the women who reported ever having experienced a sexual dysfunction (50.0%) also reported that they had ever used a sex toy during partnered sex, while 27.9% reported that they had not but that they would be willing to do so in the future. Although not statistically significant, both men and women who reported having experienced a sexual dysfunction also reported using sex toys during both masturbation and partnered sexual behavior at lower rates than those who have never experienced a sexual dysfunction. This finding refutes hypothesis nine, seeing as both men and women who have a sexual dysfunction reported lower rates of sex toy use than those without a sexual dysfunction.

Regarding comfortability using sex toys among those with sexual dysfunctions, women reported lower levels of comfortability on both items of masturbation ($M = 1.84$) and partnered sex ($M = 2.02$) than those who have never experienced a sexual dysfunction. Among men, those who reported ever having experienced a sexual dysfunction reported feeling more comfortable when using a sex toy during masturbation ($M = 1.37$) compared to those who have never had a sexual dysfunction ($M = 1.79$). However,

the reverse effect was found during partnered sex, in that men who reported having experienced a sexual dysfunction reported less comfortability when using a sex toy with a partner ($M = 1.81$) compared to those who have never had a sexual dysfunction ($M = 1.71$).

Discussion

Sex toys and sexual “aids” have existed throughout history and all over the world to help promote sexual stimulation and physiological responses. Since the rise of modern technology, the sex toy market has blossomed into a multi-billion-dollar industry, primarily emphasizing sexual pleasure. However, sex toys can also harbor a therapeutic function, eliciting sexual responsiveness among those with sexual dysfunctions. Further, sex toys can be a means of regaining comfortability with sexuality and sexual intimacy among individuals who have experienced a sexual assault (Rullo et al., 2020). The findings of this study correlate with the Positive Sexuality framework, seeing as participants acknowledged both the positive and negative effects of sex toy use, but also reported a significant level of willingness to learn about and use sex toys in the future. The empirically proven benefits of sex toys and sexual aids for dysfunction and assault-related implications align with the Positive Technology framework in that sex toys and sexual aids, through means of increasing sensitivity and overall pleasure, serve to increase sexual functioning as well as the overall quality of life for users.

American participants within this sample have reported considerable sex toy use, both during solo and partnered sex. Men and women reported similar rates of sex toy use, both during solo and partnered sex, although women consistently reported higher usage of sex toys overall. Similarly, among those who reported that they have never used sex toys, a decent percentage reported that they would be willing to try incorporating them into their masturbatory or partnered sexual behavior. This data indicates that most American adults who have not experienced using sex toys would be willing to try one in the future. The sex toy industry should consider this group of willing individuals as an entirely separate group of consumers and should market to this group accordingly. Sex toy shops and websites are often hypersexualized and intimidating environments. Further, sex toy shops can be very overstimulating, expensive, and confusing for first-time buyers, and perhaps a different approach to sex toy con

sumerism would benefit those who are willing to try sex toys but have not yet been able to have that experience. This approach could include a less overtly sexual environment, as well as an emphasis on education and pleasure for all participating individuals, as opposed to some typical sex shops that advocate for the infantilization, domination, and hypersexualization of women.

When compared to the results of Döring & Poeschl's (2020) study, participants in the present study reported higher rates of sex toy use during masturbation when compared to partnered sex. However, rates of sex toy use were similar between German and American participants among items of partnered sexual activity. The only item in which Germans scored higher than American participants was on measures of sex toy use during partnered sex, in which German men reported higher usage of sex toys than American male participants. This finding indicates that perhaps Germany, and Europe at large, has a more relaxed and sex-positive stance on sex toys, and thus are used more during partnered sex. Among participants of the present study, women reported higher rates of sex toy use during both masturbation and partnered sexual activity. Women reported higher usage of sex toys designed to stimulate the vagina and vulva overall, while men reported higher usage of toys designed to stimulate the penis and testicles - which provides support for hypotheses five and six. Trends indicate that men are more willing to try all toys listed in the survey during partnered sex, with the only statistically significant finding being that men were significantly more willing to introduce toys designed for the penis and testicles into partnered sexual activity than women were. This finding directly counters the assumption by many women that men are unwilling or uncomfortable with incorporating sex toys into partnered sexual activities (Fahs & Swank, 2013). Open communication between sexual partners is necessary to establish willingness and comfortability with incorporating sex toys into partnered sexual behaviors. There exists a toxic, heteronormative belief that most men are against the incorporation of sex toys into partnered sexual activity due to the accompanying belief that men should be able to completely satisfy their partner on their own, with their own bodies. However, the present data is directly contradictory to this harmful belief, as it was found that many men are willing to incorporate sex toys into partnered sexual activity.

Accompanying this willingness should be education. Sex toy parties are one safe environment to learn more about different kinds of sexual "aids". Among the men in our sample, 13.8% reported that they would be willing to host a sex toy party if given the opportunity, this was found to be statistically significant. Because various state laws (Alabama Anti-Obscenity Enforcement Act, 1998; Texas Public Indecency Act, 1973) consider the sale of sex toys to be a form of solicitation, men are often not allowed at sex toy parties. Further, many sex toy companies, such as Pure Romance, claim that "having some men in attendance would make some women uncomfortable" (Sex Toys, 2021). Due to these hindrances in male attendance to toy parties, male participants within this study were not asked if they have ever been invited to attend a party, and were therefore not asked if they've ever attended one nor about their levels of willingness regarding attending a party. This data reveals that a decent portion of men want or are willing to attend a sex toy party to learn more about and potentially purchase toys for themselves and their partners. Male sex toy parties could be an effective way for more men to learn about and purchase sex toys within an educational environment. Further, all individuals should feel comfortable expressing their desires with their sexual partner and be receptive to their partner's desires, because open communication may reveal that they are more willing to try new sexual experiences than previously thought.

One of the most prevalent findings of this study is that, among participants who report ever having experienced a sexual assault, both men and women report higher rates of sex toy and sexual aid usage during masturbation and partnered sexual activity, but also report lower levels of comfortability doing so. This finding is directly contrary to hypotheses seven and eight, as it was expected that the trauma of sexual assault would provoke fear of sexual behavior among victims and would deter them from using sex toys. However, participants that have been sexually assaulted reported the highest rates of sex toy usage of all participants, this could be due to several factors. Victims of sexual assault have experienced a violation of bodily autonomy that may take a substantial amount of time to gain back, and sex toys may be one way for victims to reclaim their sexuality. Rather than placing sexual pleasure and other sexual expectations on another person, sex toys are an efficient way to gradually increase the intensity or fre-

SEX TOY USE IN THE US

quency of physiological sexual responses and can help to increase desire. Sexual aids, such as lubricants or vaginal dilators, could prove useful in increasing comfortability or eliciting a sexual response among individuals who may or may not suffer from negative implications, such as trauma or a sexual dysfunction, following a sexual assault (Kaplan, 1974; Petrak & Hedge, 2002).

However, the finding that those who have ever experienced a sexual assault, despite using toys at higher rates, also reported lower levels of comfortability during these experiences with toys was unexpected. Lower comfortability with sexual activity or material following a sexual assault is common and can be expected due to the high prevalence of trauma and PTSD development after an assault (Texas A&M Health, 2019). Similarly, a common reaction to sexual assault is a change in sexual desire or activity, such as an increase in the amount of sexual or masturbatory behavior the victim engages in. Within this sample, a higher rate of sex toy usage and lower levels of comfortability were reported among those who have ever been sexually assaulted when compared to those who have never been sexually assaulted. Higher levels of toy use, despite lower levels of comfortability using these toys, may be reflective of an attempt to regain comfortability with sexual activities through the use of sex toys. Similarly, if the sexual assault resulted in a sexual dysfunction, the use of sex toys could be a means of sexual rehabilitation, despite conflicting levels of comfort. For example, vibrators that are smooth and shorter in length and circumference may be beneficial for patients who deal with genital, anal, or pelvic pain, or pain during sexual activity (Rullo et al., 2018). Regardless of why these rates of toy use and comfort persist among those who have ever been sexually assaulted, clinicians should recommend sex toys to clients with caution and guidance to help provide them with the necessary resources to regain sexual comfortability and confidence.

Both men and women who suffer from at least one sexual dysfunction reported lower rates of sex toy usage during masturbation and partnered sexual behavior than those who do not suffer from a sexual dysfunction. Lower levels of comfortability were also reported by the same group of participants, this could be due to various factors. Individuals who suffer from sexual dysfunctions may feel a sense of embarrassment or incompetency due to not wanting or not being able to perform sexually, and this may contribute to lower

levels of comfortability using toys. Participants who reported ever experiencing a sexual dysfunction may feel as though sex toys won't work to increase their sexual desire or functioning, and some of these participants may choose to abstain from any sexual behavior at all. Sensate focus and related treatments for sexual dysfunctions have been empirically proven to alleviate anxiety surrounding sexual activity and performance (Auteri, 2014; Masters & Johnson, 1980), which could prove useful among individuals who suffer from sexual dysfunctions that worsen with heightened anxiety. Further, the incorporation of sex toys into sensate focus exercises could elicit a stronger sexual response or sexual arousal than normally experienced due to increased physiological sensitivity (Rullo et al., 2020). Sensate focus allows an individual to focus purely on the physiological sensations that make them feel good, by ridding sexual behavior of expectations of orgasm, ejaculation, and pressure to please a partner. Further, it can help those with sexual dysfunctions become more comfortable with their sexual identity and to better understand what types of sensations they enjoy the most.

Although not part of our initial analysis, we did examine the self-perceived positive and negative effects of sex toy use among participants. There were substantially more positive effects reported compared to negative effects. Examples of some positive effects of sex toy use reported by participants include: "allowing me to be kinky and really bond with my partner," "butt plug helped me come out to my friends," "rabbit vibrator allowed for my partner to climax multiple times after I climaxed," and "couples vibrator (like we-vibe), or bullet vibrator during intercourse, helped my partner to relax, and to climax, enhancing overall enjoyment." There were several repeated trends among self-perceived positive effects of sex toy use. Several men reported that the use of penetrative sex toys, such as butt plugs or dildos, helped them to become more comfortable with their sexuality. Both men and women reported that the use of couples' toys, such as a joint vibrator, has helped to increase the desirability and frequency of orgasms and strengthened the bond between partners. Many women reported that the use of vibrators and/or dildos has helped them to become more familiar with their bodies and has improved their sex life by allowing them to better learn which types of touch they prefer where. Sex toy use can have great effects on sexual functioning and the strengthening

of interpersonal relationships which is reflective of the Positive Sexuality and Positive Technology frameworks. Sex toys have only increased in popularity and functionality since they became technologically innovative. These toys have shown promise to increase various aspects of sexuality, such as sensitivity and overall pleasure, and can help to restructure an individual's perception of their sexuality and sexual functioning.

However, there were also a considerable amount of negative self-perceived effects of sex toy use reported among participants. Examples of negative effects reported include "I feel that I may be more comfortable with toys [than] the real thing sometimes," "when I'm with a partner that traditionally doesn't use toys, I can feel judged a bit when suggesting them," and "felt guilty about masturbating with a toy larger than my husband's penis." Negative experiences, however slight, with sex toys during an intimate and vulnerable sexual encounter can significantly hinder one's perception of and potential future use of sex toys and sexual behavior overall. Several women within this study reported that they felt judged or ashamed of their sex toy use, during masturbation or partnered sex, for various reasons including their partner's perception of toy use, and embarrassment of requiring toys to increase sensitivity or feeling like they depend on toys for pleasure during sexual activity. Thoughtful discussion is necessary between partners for the proper acquisition and incorporation of sex toys into their individual or joint sex lives. Sex toys are not the main attraction of sexual activity, but are merely a means of increasing pleasure and sensitivity, and can even bring a sense of newness or excitement into partnered sex.

The introduction of sex toys and sexual aids into sex therapy is both a controversial and ethical issue. An increasing number of clinicians are recommending sex toys and sexual aids for individuals who suffer from sexual dysfunctions relating to sexual assault or cancer-related treatments (Bober et al., 2019), as these tools can increase sensitivity and physiological response to sexual stimulation. Aside from merely recommending clients to use sex toys and sexual aids at their own discretion, many clinicians are advocating for the advancement of sex therapy to include sexological bodywork, which is a form of educational sex therapy that potentially allows for one-way sensual touch between the clinician and the client, although not always (Rowett, 2020). Sexological bodywork involves

aspects of education, sexuality, consent, individual and interpersonal identity, and learning which techniques can help a client maximize comfortability and pleasure. This form of sex therapy may involve sex toys, which can be utilized at the client's request to better understand how these sexual aids can increase arousal, pleasure, and intimacy alone or between partners. "Most practitioners will say their client sessions are around 30% touch and 70% non-touch - such as establishing boundaries, breathwork, nervous system regulation, embodiment techniques, and movement" (Rowett, 2020). Although met with significant resistance, sexological bodywork is increasing in popularity among individuals who suffer from sexual dysfunction, trauma, or assault-related issues, and shows significant promise for the future of sex therapy. However, the ability for a clinician to touch a client's body and manipulate their genitals for purposes of tension redistribution and sexual education is currently illegal in all states except California, where only a select few individuals are licensed to practice sexological bodywork (Rowett, 2020). This is a recent modality of sex therapy and education, thus accounting for the lack of empirical research on its benefits. However, numerous female clients have been taking to the internet to blog about their positive experiences with the practice (Magner, 2017; Dubofsky, 2018). Just as vibration techniques were used as a clinical means of treating hysteria among 20th-century women (Horowitz, 2020), sex toy use in sex therapy or sexological bodywork shows promise for the treatment of sexual dysfunctions or issues surrounding sex following a sexual assault.

Limitations

This study had several limitations. Because data was collected in the form of an anonymous survey, the data relies on self-report measures of sexuality and sexual behavior. The survey link was posted on [Reddit.com/samplesize](https://www.reddit.com/samplesize), and thus relied on convenience sampling. Actual rates of comfortability may vary from those that the participants self-reported, potentially due to a desire to provide socially desirable data or because those who use Reddit may have different inclinations to use toys. Further, there were many more women in the sample than men, and thus the data received from male participants may not be as representative of the general population. Most men within the sample (61%) reported ever having used a sex toy during masturbation, and this refutes

SEX TOY USE IN THE US

the assumed belief that men are more hesitant to use sex toys. However, due to the limited number of men within the sample, actual statistics may vary.

The present study was forced to exclude participants from the analysis who identified as anything other than a man or woman. 3.7% of the sample ($n = 12$) self-identified as an “other” gender, but because this sample was so small they were excluded from the study. Future research could focus on other-gendered participants to better understand the prevalence and characteristics of their sex toy use. As discussed by Fahs and Swank (2013), nonheterosexual and other-gendered individuals may not emphasize phallogentrism and male dominance during sexual activity with a partner, and may feel more inclined to use sex toys as a means of campy and subversive pleasure.

Because this survey and individual items were created by the researchers, as well as borrowed from the work of Döring and Poeschl (2020), there are no psychometric properties to report. However, using standardized measures to assess prevalence, comfortability, and willingness regarding sex toys could have provided stronger research support for this study.

Finally, the participants of this study were largely young white college students. Older individuals or individuals without technological access may not have been able to access the survey link because it was posted to Reddit and Ball State University’s Communication page. Our study’s lack of diversity could be expanded upon in future research, emphasizing minority or older cohort sex toy use.

Implications for Future Research

This study could be expanded to include a larger minority sample, including sexual, gendered, and racial minorities, to better understand their sex toy use and how they became socialized to utilize these toys. Further, future research could focus on an older cohort sample, as the rate of sexual dysfunctions tends to increase exponentially with age. Sex toys could elicit heightened sensitivity or arousal from individuals who suffer from age-related sexual dysfunctions and could further help connect partners.

With respect to sexual dysfunctions, future research could examine how sex toys and sexual aids can be incorporated into sex therapy to help increase physiological responses following a sexual assault. Sex toys could be incorporated into sensate focus exercises to increase sensitivity and pleasure for the individual,

allowing them to focus solely on the pleasurable sensations. To combat the physiological complications of sexual dysfunction, clinical psychologists may recommend or prescribe various sexual aids to use either alone or with a partner. These sexual aids may include vibrators, dilators, Kegel balls, and dildos, and successive approximations may be utilized until the client gradually becomes more comfortable with sensual touching, and eventually, sexual intercourse. However, the introduction of sex toys into sex therapy recommendations for victims of sexual assault should be predated with caution and a thoughtful discussion between the client and the clinician, as some of these individuals may suffer from PTSD (Yu Yip & Yuen, 2010).

Conclusion

The findings of this study indicate that a substantial number of American adults have ever used a sex toy during solo or partnered sex. Among women, the most used sex toys during masturbation included toys designed for the stimulation of the vagina and vulva, lubricants, and erotic lingerie. Among men, the most used sex toys and sexual aids during masturbation included lubricants, toys designed for the stimulation of the penis and testicles (see Table 2), and toys designed for the stimulation of the vagina and vulva. Men and women were about equally likely to have used lubricants, remedies for enhancing arousal, toys designed for the stimulation of the penis and testicles, and toys for bondage and S&M during partnered sexual activity. Similarly, among participants who have never used a sex toy, a significant portion of this subsample would be willing to incorporate sexual aids into solo or partnered sexual behavior in the future. Nearly an identical percentage of men and women who have been sexually assaulted reported using a sex toy during masturbation, and men reported slightly higher rates of toy use during masturbation compared to women. However, both men and women who have been sexually assaulted reported lower levels of comfortability during their previous experiences using sex toys. Future research could explore how sex toys could be utilized as a method of treatment for sexual dysfunctions or implications following a sexual assault.

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SEX TOY USE IN THE US

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SEX TOY USE IN THE US

Table 1

Frequencies among Men and Women that Have or are Willing to Use Sex Toys

	Men (<i>n</i> = 84)				Women (<i>n</i> = 215)			
	German	Yes	Willing	Y + W	German	Yes	Willing	Y + W
Researching								
Researched Toys	76	80	9	89	76	87	8	95
Searched Online for Toys	73	81	11	92	70	82	11	93
Spoke to Someone Else about Toys	-	33	28	61	-	46	27	73
Acquiring								
Bought a Sex Toy	61	62	27	89	63	75	19	94
Received a Sex Toy as a Gift	20	12	-	12	35	21	-	21
Toy Parties								
Invited to a Sex Toy Party	-	0	-	-	-	37	-	37
Attended a sex Toy Party	-	-	-	-	-	64	29	93
Hosted a Sex Toy Party	-	0	14	14	-	6	28	34
Using								
Used a Toy for Solo Sex	37	63	24	87	53	76	18	94
Used a Toy for Partnered Sex	52	48	41	89	53	58	32	90

Note. Bolded are significant at $p = .002$; dashes represent data that was not obtained or is not relevant to this study.

Table 2*Percentage of Participants Who Reported Using Each Type of Toy by Gender*

	Masturbation		Partnered Sex	
	Men (<i>n</i> = 84)	Women (<i>n</i> = 215)	Men (<i>n</i> = 84)	Women (<i>n</i> = 215)
Erotic Lingerie	14.9	22.8	19.5	33.5
Lubricants	47.1	42.9	35.6	40.6
Remedies for Enhancing Arousal	3.4	1.8	4.6	5.8
Toys Designed for Vagina/Vulva	26.4	69.2	32.2	46.9
Toys Designed for Penis/Testicles	42.5	5.8	19.5	15.2
Toys for Bondage/S&M	16.1	16.1	21.8	23.2

Note. Bolded are significant at $p < .001$

SEX TOY USE IN THE US

Table 3*Means and Standard Deviations for Comfort Items Among Men and Women*

	Men (<i>n</i> = 69)		Women (<i>n</i> = 193)		t
	M	SD	M	SD	
Researched	2.09	1.21	2.51	1.56	-2.32
Looked at Sex Toys Online	1.72	1.11	2.11	1.33	-2.29
Spoke to Someone Individually About Toys	2.32	1.28	2.55	1.42	-0.82
Invited to Attend a Toy Party	-	-	2.95	1.68	-
Hosted a Toy Party	-	-	2.00	0.85	-
Bought a Sex Toy	2.40	1.47	2.57	1.60	-0.71
Received a Sex Toy as a Gift	1.80	1.48	2.02	1.22	-0.44
Used Sex Toy Solo	1.64	1.19	1.70	1.17	-0.33
Used Sex Toy Partner	1.75	1.26	1.90	1.29	-0.67

Note. Bolded are significant at $p < .001$; lower means represent higher levels of comfortability.

Predicting Satisfaction With Life and Affect Balance Using Trait Interactions

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There is robust support for the finding that subjective well-being (SWB) relates positively to extraversion, agreeableness, and conscientiousness; and negatively to neuroticism (Soto, 2015), but little research has examined how SWB can be predicted from interactions between traits. It was hypothesized that conscientiousness, extraversion, and agreeableness would moderate the relationship between neuroticism and SWB, as measured by satisfaction with life (SWL) and affect balance (AB). In Study 1, self-reports of the Big Five personality traits, SWL, and AB were collected via MTurk ($N=1035$). Hierarchical regression analyses were used to predict SWL and AB from interactions between traits. The relationship between neuroticism and SWL was moderated by conscientiousness ($b=.15, p=.02$) and extraversion ($b=.11, p=.03$), while the relationship between neuroticism and AB was moderated by conscientiousness ($b=.09, p=.02$) and agreeableness ($b=.09, p=.03$). Positive personality traits (defined as extraversion, agreeableness, and conscientiousness within this study) were positively related to SWB at high levels of neuroticism, but unrelated to SWB at low levels of neuroticism. This was explored further using a student population in Study 2 ($N=151$), and the results were partially replicated. This study highlights the importance of considering more than one trait at a time when predicting important outcomes such as SWB.

Keywords: Subjective well-being, Satisfaction with life, Positive and Negative Affect, Big Five personality traits, Trait interactions, Affect Balance

On July 4th, 1776 the Continental Congress approved a document declaring that all people have the right to “life, liberty, and the pursuit of happiness” (U.S. Declaration of Independence, 1776, para. 2). Similar wording was used earlier that same year in the Virginia Declaration of Rights which stated that everyone should be able to “[pursue] and [obtain] happiness and safety” (Virginia Declaration of Rights, 1776, para. 1). Aristotle claimed that when we are pursuing “honor, pleasure, intellect, [and] in fact every excellence” we are in reality using these pursuits to obtain happiness (Aristotle, ca. 350 B.C.E./1994). These and many other works throughout history, religion, philosophy, and science display a seemingly universal human desire to pursue and obtain happiness.

The pursuit of happiness naturally leads to the question “What makes us happy?”. If we can identify some of the conditions under which an individual is likely to be happy, we can work towards helping others achieve higher levels of happiness and general well-being. The term happiness has been notoriously difficult to operationalize (see Gilbert, 2007; Mogilner et al., 2011; Myers & Diener, 1995), and so many researchers instead prefer to use the term well-being. In the current study, well-being is defined as an individual’s subjective evaluations of their overall life satisfaction and their experience of positive and negative emotions. This is a common conceptualization of well-being that is typically referred to as subjective

well-being (SWB; Diener et al., 2018). SWB research typically uses self-report measures, which allow both affective and cognitive information to be gathered simultaneously (Andrews & Mckennell, 2005; Horley & Little, 1985; Larsen et al., 1985), and focuses on subjective self-perceptions about one’s own life instead of using an external frame of reference (Diener et al., 1997; Diener et al., 2018). SWB can be broken down into three separate components: the presence of positive emotions or affect (PA), the absence of negative emotions or affect (NA), and general satisfaction with life (SWL; Diener et al., 2018). It is also common to create a single score of affect balance (AB) by subtracting NA from PA (Gutiérrez et al., 2005). Structural equation modeling has been used to demonstrate that SWB can effectively be broken down into these three separate but related components (Arthaud-day et al., 2005, Lee & Oguzoglu, 2007; Singh & Jha, 2008).

In many ways, SWB can be conceptualized as a personality trait because it is relatively stable across situations and time, with situational and environmental factors only exerting a short-term impact (Diener et al., 1999). Several studies have shown that SWB often acts as a homeostatic process, with individuals readily returning to some SWB set point following a major life event that caused deviation from that set point (Cummins et al., 2012; Headey & Wearing, 1989). Stable environmental factors such as daily hassles and job satisfaction cannot fully account for the stability seen

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

in SWB, so other factors must be involved (Kozma et al., 2000). Affect in particular has long-term implications, with one study finding that positive emotion in college (as measured from the intensity of an individual's smile in pictures from their college yearbook) significantly predicted well-being 30 years later (Harker & Keltner, 2001). Finally, like traits, SWB shows stability across situations such as work and recreation (Diener & Larsen, 1984) and also shows some state-like features that are sensitive to situational factors (Kozma et al., 2000).

The fact that SWB shows so many features that are similar to personality traits suggests that there may be a relationship between personality traits and SWB, which has been demonstrated in the literature (Gutiérrez et al., 2005). The most commonly used model of broad personality traits is the Five Factor Model, which includes the traits of extraversion (sociability, assertiveness, energy level), agreeableness (compassion, respectfulness, trust), conscientiousness (organization, productiveness, responsibility), neuroticism/negative emotionality (anxiety, depression, emotional volatility), and openness to experience (also sometimes called intellect or open-mindedness; intellectual curiosity, aesthetic sensitivity, creative imagination; Goldberg, 1990; John et al., 2008; Soto & John, 2017). The most empirically supported correlates of personality traits and SWB are between extraversion and PA, and between neuroticism and NA (Costa & McCrae, 1980). There is also some evidence that openness is related to higher PA (McCrae & Costa 1991). A meta-analysis of 148 studies found that neuroticism consistently predicts lower SWL and higher NA, agreeableness and extraversion predict higher PA, and conscientiousness is the best predictor of higher SWL (DeNeve & Cooper, 1998). The authors argue that extraversion and agreeableness impact SWB by leading to more positive emotion, while conscientiousness leads individuals to set goals and work to achieve those goals, which leads to more SWL. Finally, McCrae and Costa (1991) argued that openness was a positive predictor of both PA and NA and that it led to more emotions overall. However, the meta-analysis by DeNeve et al. found openness to be the weakest predictor of SWB compared to the other traits. This may be due to DeNeve et al.'s use of an expanded definition with openness to include cognitive vari-

ables (e.g., belief in a just world, mental absorption, and rigidity) or to the fact that openness is still the least understood of the five factors (see DeYoung, 2015 for an attempt to rectify this problem). For this reason, openness was not included in the current study.

Overall, the mechanisms behind the connection between SWB and personality traits are still not well understood. With regards to extraversion, it may be that extraversion is related to greater sociability which in turn is related to higher SWB (Bradburn, 1969; Okun et al., 1984), but there is research that suggests sociability cannot account completely for this relationship (Harris et al., 2017) and that even if extraverts are in nonsocial occupations, they still have higher SWB than introverts (Diener et al., 1984). There is also not a perfect relationship between extraversion and happiness. Indeed, research has found support for happy introverts who seem to not be significantly different in many of their preferences (such as friendship relations and introspective activities) from happy extraverts, possibly due to extraversion playing a mediating role in how individuals pursue happiness (Hills & Argyle, 2001). Another possibility not mentioned or investigated in previous research is the idea that personality traits can interact with each other in how they influence SWB. For example, an agreeable extravert may act differently than a disagreeable extravert and therefore have different levels of SWB.

A good place to start when investigating the moderating role of various traits may be an examination of the strong and consistent relationship between neuroticism and SWB. Neuroticism is essentially a measure of negative emotions such as fear, anger, sadness, and anxiety (Soto & John, 2017) and is sometimes referred to as negative emotionality. It may be no surprise that there is a strong negative relationship between neuroticism and SWB, and other personality traits possibly serve moderating roles in the relationship between neuroticism and SWB. The current work builds on past research linking personality and SWB and looks at the moderating role of extraversion, agreeableness, and conscientiousness on the negative relationship between neuroticism and SWB. Neuroticism has been consistently linked with SWB and has been shown to have a negative relationship with SWL and PA and a positive relationship with NA. Conscientiousness, extraversion, and agreeableness all have positive relationships with well-being.

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The fact that SWB shows so many features that are similar to personality traits suggests that there may be a relationship between personality traits and SWB, which has been demonstrated in the literature (Gutiérrez et al., 2005). The most commonly used model of broad personality traits is the Five Factor Model, which includes the traits of extraversion (sociability, assertiveness, energy level), agreeableness (compassion, respectfulness, trust), conscientiousness (organization, productiveness, responsibility), neuroticism/negative emotionality (anxiety, depression, emotional volatility), and openness to experience (also sometimes called intellect or open-mindedness; intellectual curiosity, aesthetic sensitivity, creative imagination; Goldberg, 1990; John et al., 2008; Soto & John, 2017). The most empirically supported correlates of personality traits and SWB are between extraversion and PA, and between neuroticism and NA (Costa & McCrae, 1980). There is also some evidence that openness is related to higher PA (McCrae & Costa 1991). A meta-analysis of 148 studies found that neuroticism consistently predicts lower SWL and higher NA, agreeableness and extraversion predict higher PA, and conscientiousness is the best predictor of higher SWL (DeNeve & Cooper, 1998). The authors argue that extraversion and agreeableness impact SWB by leading to more positive emotion, while conscientiousness leads individuals to set goals and work to achieve those goals, which leads to more SWL. Finally, McCrae and Costa (1991) argued that openness was a positive predictor of both PA and NA and that it led to more emotions overall. However, the meta-analysis by DeNeve et al. found openness to be the weakest predictor of SWB compared to the other traits. This may be due to DeNeve et al.'s use of an expanded definition with openness to include cognitive vari-

ables (e.g., belief in a just world, mental absorption, and rigidity) or to the fact that openness is still the least understood of the five factors (see DeYoung, 2015 for an attempt to rectify this problem). For this reason, openness was not included in the current study.

Overall, the mechanisms behind the connection between SWB and personality traits are still not well understood. With regards to extraversion, it may be that extraversion is related to greater sociability which in turn is related to higher SWB (Bradburn, 1969; Okun et al., 1984), but there is research that suggests sociability cannot account completely for this relationship (Harris et al., 2017) and that even if extraverts are in nonsocial occupations, they still have higher SWB than introverts (Diener et al., 1984). There is also not a perfect relationship between extraversion and happiness. Indeed, research has found support for happy introverts who seem to not be significantly different in many of their preferences (such as friendship relations and introspective activities) from happy extraverts, possibly due to extraversion playing a mediating role in how individuals pursue happiness (Hills & Argyle, 2001). Another possibility not mentioned or investigated in previous research is the idea that personality traits can interact with each other in how they influence SWB. For example, an agreeable extravert may act differently than a disagreeable extravert and therefore have different levels of SWB.

A good place to start when investigating the moderating role of various traits may be an examination of the strong and consistent relationship between neuroticism and SWB. Neuroticism is essentially a measure of negative emotions such as fear, anger, sadness, and anxiety (Soto & John, 2017) and is sometimes referred to as negative emotionality. It may be no surprise that there is a strong negative relationship between neuroticism and SWB, and other personality traits possibly serve moderating roles in the relationship between neuroticism and SWB. The current work builds on past research linking personality and SWB and looks at the moderating role of extraversion, agreeableness, and conscientiousness on the negative relationship between neuroticism and SWB. Neuroticism has been consistently linked with SWB and has been shown to have a negative relationship with SWL and PA and a positive relationship with NA. Conscientiousness, extraversion, and agreeableness all have positive relationships with well-being.

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

Considering this, the following was hypothesized.
Hypothesis 1: Neuroticism will have a negative relationship with SWB.

Hypothesis 2: “Positive traits,” or conscientiousness, extraversion, and agreeableness, will moderate the negative relationship between neuroticism and SWB, with higher levels of each positive trait predicting a weaker relationship between neuroticism and SWB.

Study 1¹

Method²

Participants

Data for study 1 were taken from three separate online studies that used Amazon’s Mechanical Turk (MTurk). Participation was voluntary through the MTurk website, and a 50-cent compensation was offered as payment for completing the study. Only those who correctly answered at least 80% of attention checks and completed at least 80% of the procedure received payment and were included in the data analyses. This stipulation was clearly stated in the MTurk posting and the informed consent document. A total of 1150 participants were recruited for this study, and 120 participants did not pass at least 80% of the attention checks or were removed because of missing data. The final participants included 1035 individuals (69.57% female, 29.95% male, .004% non-binary gender identity) from the United States between the ages of 18 and 78 ($M_{age} = 37.28$, $SD_{age} = 12.65$). Race was 78.9% White, 7.2% Black/African American, 5.2% Asian, 8.0% other, and 0.6% no response. An a priori power analysis to determine the sample size for the current analyses was not conducted because the data were collected for other purposes. A sensitivity analysis was used to determine how large of an effect could be detected with the current sample size. G*power was set to “Linear multiple regression: Fixed model, R2 increase.” A power of .80 was selected with an alpha of .05. The sample size was set to match the current study and the number of predictors was set to 3 (neuroticism, [other trait of current interest], neuroticism * [trait of interest] interaction). This resulted in an f^2 of .011 reliably detectable by the current power level and sample size³.

Measures

Big Five Inventory (BFI). The BFI is a 44-item measure made up of brief descriptions of behavior, thoughts, and feelings (John et al., 2008). Respondents indicate the extent to which these items describe themselves on a 5-point scale, ranging from “Strongly disagree” to “Strongly agree.” The BFI has adequate internal reliability ($\alpha = .75-.80$) and test-retest reliability over a period of three months ($r = .80-.90$; Rammstedt & John, 2005, 2007). It assesses the five major domains of personality: extraversion, agreeableness, openness, conscientiousness, and neuroticism. Within the current study, all domains had adequate reliability ($\alpha = .82-.86$).

Satisfaction With Life Scale (SWLS). The SWLS is a 5-item measure of global cognitive judgments of satisfaction with one’s life (Diener et al., 1985). Responses are measured on a 7-point scale, ranging from “Strongly disagree” to “Strongly agree.” The SWLS has adequate internal reliability ($\alpha = .87$) and test-retest reliability over a period of two months ($r = .82$; Diener et al., 1985). Within the current study, the scale had high reliability ($\alpha = .94$).

Positive and Negative Affect Schedule (PANAS). The PANAS is a 20-item measure of both positive and negative affect (Watson et al., 1988). Items include words that correspond to positive or negative emotions. The trait version of the scale was used, which asks participants to “indicate to what extent you generally feel this way, that is, how you feel on the average.” Responses are on a 5-point scale ranging from “Not at all” to “Extremely.” The PANAS has good internal reliability for both scales (PA $\alpha = .88$; NA $\alpha = .77$) and has demonstrated adequate reliability over a 2-month period (PA $r = .68$; NA $r = .71$; Watson et al., 1988). Within the current study, the scale had high reliability (PA $\alpha = .94$; NA $\alpha = .94$). To compute scores representative of Affect Balance, negative affect was subtracted from positive affect. Thus, numerically positive scores indicate more positive affect than negative affect, while numerically negative scores indicate more negative affect than positive affect.

Procedure

For Study 1, participants responded to at least the three self-report measures described in the previ

¹Study 1 was not pre-registered, but Study 2 was. This can be found at: https://osf.io/qyv3g/?view_only=74c6fc489bf94e15bd66eef34e6cc422

²All R script and data for this study can be found at https://osf.io/n5jhw/?view_only=b8f1af679dad4fe281701928b5c4ac27

³All effect sizes in this study were calculated using $(R2AB - R2A)/(1 - R2AB)$.

ous section. They also observed recorded interactions and provided personality judgments of the person in each video (these data were not used for this paper).

Analyses

Hypothesis 1 Analysis. The relationship between Neuroticism and SWB was assessed in two ways. First, we examined Pearson's correlation coefficient between Neuroticism and SWL, and Neuroticism and Affect Balance. Second, we examined regression models wherein Neuroticism predicted SWL and Affect Balance separately. Most assumptions for correlational analysis were met in that variables appeared to have a linear relationship based on the examination of scatter plots and were normally distributed based on examination of histograms, skewness, and kurtosis. When examining outliers, five outliers were identified for the variable of Affect Balance, with participants having lower Affect Balance scores than 1.5 times the interquartile range below the first quartile. However, no significant differences were found throughout the analysis when these outliers were excluded compared to when the outliers were included. Outliers did not appear to be due to measurement error and simply represented a few participants with particularly negative affect. For both of these reasons, outliers were included in the analysis.

Hypothesis 2 Analysis. Hierarchical regression analyses were conducted with SWL and AB as the dependent variables in separate analyses to examine how the positive personality traits of extraversion, agreeableness, and conscientiousness moderated the relationship between neuroticism and SWB (Baron & Kenny, 1986). Age was significantly correlated with affect balance. All analyses were computed with and without control for age, but this did not change the interpretation of results, so the more parsimonious (without age) model was used. The analyses assessed the incremental explanatory power of the variables in each block. The variables were entered into separate hierarchical regression models in the following order: extraversion, agreeableness, and conscientiousness, respectively, as well as neuroticism, were entered in step 1. Two-way interaction terms (neuroticism x extraversion, neuroticism x agreeableness, neuroticism x conscientiousness) were entered in step 2. According to Baron and Kenny (1986), a significant moderator effect is indicated by significant incremental variance in the dependent variable after the inter-

action terms are added to the regression equation.

Assumptions of multiple regression were not violated such that there appeared to be linear relationships between independent and dependent variables when examining scatter plots, normality and homoscedasticity of residuals when examining Normal Q-Q and Residual vs Fitted plots respectively, and independence of residuals, as checked using VIF values, which were well below acceptable levels.

Results

Descriptive statistics and correlations between the Big Five, SWLS, and AB are presented in Table 1. Consistent with previous research, and in support of Hypothesis 1, neuroticism was negatively correlated with SWL ($r(1033) = -.38, p < .001, 95\% \text{ CI } [-.43, -.33]$) and AB ($r(1033) = -.63, p < .001, 95\% \text{ CI } [-.67, -.60]$). Additionally, neuroticism was negatively correlated with the positive personality traits of extraversion, agreeableness, and conscientiousness. In further support of Hypothesis 1, simple linear regressions found that for SWL, the overall regression was statistically significant ($R^2 = .14, F(1, 1043) = 176.95, p < .001$), and neuroticism significantly predicted SWL ($b = -0.68, p < .001$). And for AB, the overall regression was again statistically significant ($R^2 = .4, F(1, 1043) = 709.6, p < .001$), with neuroticism significantly predicting AB ($b = -0.95, p < .001$).

Table 2 shows that, as expected from previous literature, in Step 1, positive personality traits significantly predicted SWL, while neuroticism was a negative predictor of SWL. In Step 2, adding interaction terms revealed extraversion ($b = .12, p = .02, f^2 = .005, R^2 \text{ change} = .004$) and conscientiousness ($b = .15, p = .02, f^2 = .006, R^2 \text{ change} = .005$) to be significant moderators of neuroticism on SWL, while agreeableness was not a significant moderator ($b = .06, p = .31, f^2 < .001, R^2 \text{ change} < .001$).

Table 3 shows that, in Step 1, positive personality traits significantly positively predicted AB while neuroticism negatively predicted AB. In Step 2, adding interaction terms to the model revealed that agreeableness ($b = .09, p = .02, f^2 = .005, R^2 \text{ change} = .003$) and conscientiousness ($b = .09, p = .02, f^2 = .005, R^2 \text{ change} = .003$) significantly moderated the effect of neuroticism on AB, but extraversion did not ($b < .01, p = .92, f^2 < .001, R^2 \text{ change} < .001$). Thus, Hypothesis 2 was partially supported.

To examine the interaction patterns, the interac-

tion effects were plotted by simple slopes of SWL and AB at high and low levels ($\pm 1SD$ from the mean) for Neuroticism and positive personality traits. The interaction patterns for extraversion, conscientiousness, and agreeableness with the outcome variable SWL are depicted in Figures 1a, 1b, and 1c, respectively. Figure 1a suggests that across all levels of neuroticism, higher extraversion is associated with higher SWL. However, the difference in SWL at high levels of neuroticism is much more pronounced than at low levels of neuroticism. Figure 1b illustrates a similar story, with higher conscientiousness predicting higher SWL across levels of neuroticism, but with larger differences between levels of extraversion at high levels of neuroticism as opposed to low levels of neuroticism. Figure 1c shows a similar pattern in terms of higher neuroticism predicting lower SWL, and lower levels of agreeableness predicting lower SWL. However, Figure 1c illustrates that agreeableness was not a significant moderator, such that individuals with both high and low levels of agreeableness have similar relationships between SWL and neuroticism. In other words, highly neurotic individuals may benefit more in terms of SWL from high levels of positive traits like extraversion and conscientiousness than individuals low in neuroticism, but this is not necessarily true for the positive trait of agreeableness.

Figures 2a, 2b, and 2c show the moderating effect of extraversion, conscientiousness, and agreeableness on the relationships between neuroticism and AB, respectively. Figures 2b and 2c show the significant interaction effect, again showing that higher conscientiousness and agreeableness are related to higher AB, with the difference in AB being more pronounced at higher levels of neuroticism. On the other hand, Figure 2a shows that the level of neuroticism does not interact with the level of extraversion to influence AB, with the difference in AB at high and low levels of neuroticism being similar regardless of level of extraversion.

Discussion

Overall, the findings for this study were a little mixed. In some instances, positive personality traits seemed to moderate the relationship between neuroticism and SWB while in other instances they did not. It is possible that there is still a clear relationship between these variables, but more research is needed to help investigate this further.

Study 2 - Replication

Within the last decade, research in psychology has begun to increasingly stress the importance of replicating results. Several studies have been published that call into question some seminal research that is taught in many introductory psychology classes (Open, 2015). Although the debate over the replicability of many of these studies continues, what is clear is that attempting to replicate results is important. For this reason, Study 2 attempted to replicate the results in Study 1 within a different sample and with different but conceptually similar measures. Many things can impact the likelihood of a successful replication, including the a priori assumptions about what constitutes a successful replication (see Asendorpf et al., 2016, for a discussion on recommendations for increasing replication). The most conservative and straightforward method is to compare the key parameters of the replication attempt to those in the original study, focusing specifically on the replication of statistical significance and the corresponding direction of effects. One main issue with determining a replication in this manner is that it creates a dichotomy where small differences in p-values could lead to a conclusion that the original results were not replicated. This is especially true when replication studies have less power than the original study (Asendorpf et al., 2016), and therefore have a smaller probability of finding a statistically significant effect of the same magnitude (which is the case within this study).

Another way of determining the success of a replication is by looking at the overlap between confidence intervals (CI). If the parameters of interest from the replication study are contained within the CI of the original study, or if there is a significant overlap between the CIs of both studies, a case can be made for the replicability of the original results. This method is less conservative than relying on statistical significance but is still sensitive to power differences between studies (Asendorpf et al., 2016). This means that if a replication study is powered differently from the original study, results should be interpreted with caution.

The current study used all of these methods. When comparing parameters from the replication to the original study, if the direction of the effect is the same, CI's overlap, the replication parameters are contained within the CI of the original study, and both are statistically significant, a strong case for replication can be made. The fewer of these standards that a repli

cation effect meets, the weaker the case for replication. All results should be interpreted with this in mind.

Method

Data from this study were taken from a separate unrelated study that examined the impact of prior information on personality judgment accuracy (Gibson 2019).

Participants

Participants were recruited using Idaho State University's psychology department participant pool. Participation was voluntary, and participants were compensated with class credit. Only participants who correctly answered 80% of attention checks were included in the data analysis. The final participants included 151 individuals (this number was determined based on power analysis for the original study; Gibson 2019); 73% female, 26% male, <1% other gender identity) between the ages of 18 and 46 ($M_{age} = 21.44$, $SD_{age} = 4.15$). Self-identified ethnicity in the form of a free-response question was 80.9% White/Caucasian (Non-Hispanic), 11.1% Hispanic/Latinx, 1.9% Asian, and 6.1% other. A sensitivity analysis was used to determine how large of an effect could be detected with the current sample size. G*power was set to "Linear multiple regression: Fixed model, R2 increase". A power of .80 was selected with an alpha of .05. The sample size was set to match the current study and the number of predictors was set to 3 (neuroticism, [other trait of current interest], neuroticism * [trait of interest] interaction). This resulted in an f^2 of .074 reliably detectable by the current power level and sample size.

Measures

The following measures, while not inclusive of all the measures completed by participants in this study, are the relevant measures used in the following analysis⁴.

The Big Five Inventory-2 (BFI-2). The BFI-2 is a 60-item measure made up of brief descriptions of behavior, thoughts, and feelings (Soto & John, 2017). Respondents indicate the extent to which these items describe themselves on a 5-point scale, ranging from "Strongly disagree" to "Strongly agree." The BFI-2 has adequate internal reliability ($\alpha = .84-.91$). It assesses the five major domains of personality: extraversion, agreeableness, open-mindedness, conscientiousness, and negative emotionality (previously labeled neuroticism). Within the current study, the Cronbach's alpha reliabilities of each of the 12-item

domain scales were highly reliable (Extraversion $\alpha = .82$, Agreeableness $\alpha = .82$, Conscientiousness $\alpha = .86$, Emotional Stability $\alpha = .90$, and Openness $\alpha = .80$).

Satisfaction With Life Scale. Within this study, the Cronbach's alpha reliability of the 5 items within the SWLS measure was found to be highly reliable ($\alpha = .85$).

Positive and Negative Affect Schedule. Within this study, the Cronbach's alpha reliability of the two scales was found to be highly reliable (PA $\alpha = .88$, NA $\alpha = .83$).

Procedure

Participants were brought into a lab and asked to sit in front of a computer. After a short introduction video, participants completed the informed consent form and provided personality information using the BFI-2 (Soto & John, 2017) via the self-report form. Participants then watched video interactions of other individuals and judged their personalities, which is not relevant to the research question currently being explored. After completing this judgment portion, participants completed another set of self-report measures, including the PANAS (Watson et al., 1988) and SWLS (Diener et al., 1985).

Analyses

All analyses were performed in the same way as in Study 1. Assumptions for correlational analysis and multiple regression analysis were not violated.

Results

Descriptive statistics and correlations between the Big Five domains, SWL, and AB are presented in Table 4. Consistent with previous research and Study 1, neuroticism was negatively correlated with extraversion, agreeableness, conscientiousness, SWL, and AB. Age was not related to either outcome, but gender was related to SWL such that males had higher levels of SWL than females. As in study 1, all models were run with and without a gender control and this resulted in no differences in interpretation of the results, so the more parsimonious model was used for results.

Table 5 shows that extraversion and conscientiousness significantly predicted SWL, while neuroticism was a negative predictor of SWL. In Step 2, adding interaction terms revealed extraversion ($b = .37$, $p = .02$, $f^2 = .028$, R^2 change = .027) to be a significant moderator of neuroticism on SWL, while conscientiousness ($b = .31$, $p = .07$, $f^2 = .022$, R^2 change = .015)

⁴Participants also completed Ryff's Psychological Well-being Scale and a measure of fixed and growth mindset of intelligence.

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

and agreeableness ($b = .24, p = .20, f^2 = .011, R^2 \text{ change} = .008$) were not statistically significant moderators. Table 6 shows that, surprisingly, in Step 1, only conscientiousness significantly positively predicted AB, while neuroticism negatively predicted AB. In Step 2, adding interaction terms to the models revealed that agreeableness ($b = -.26, p = .04, f^2 = .029, R^2 \text{ change} = .022$) significantly moderated the effect of neuroticism on AB, but extraversion ($b = -.03, p = .79, f^2 < .001, R^2 \text{ change} < .001$) and conscientiousness ($b = .01, p = .95, f^2 < .001, R^2 \text{ change} < .001$) did not.

To examine the interaction patterns, the interaction effects were plotted in the same way as in Study 1. The interaction pattern for extraversion with the outcome variable SWL is depicted in Figure 3. Figure 3 suggests that at high levels of neuroticism, higher extraversion is associated with higher SWL. However, the difference in SWL at low levels of neuroticism between levels of extraversion is negligible. This mirrors the patterns found in Study 1, with individuals high in neuroticism potentially benefiting more from possessing the trait of high extraversion. Figure 4 displays the interaction pattern for agreeableness with the outcome of AB. This figure shows a distinctly different pattern than what was found in Study 1. At high levels of neuroticism, the difference in AB is negligible, whereas, at low levels of neuroticism, the difference in AB at different levels of agreeableness is more pronounced, with high agreeableness predicting higher AB. This suggests that for individuals high in neuroticism, AB is low despite the presence of high levels of agreeableness.

Discussion

As mentioned earlier, evidence in support of replication can come in many forms, some more stringent than others. Within this study, multiple methods were used to examine how well Study 2 replicated the results found in Study 1, including 1) whether the effects were in the same direction in both studies, 2) whether the CIs overlapped, 3) whether the replication parameters were contained within the CI of the original study, and 4) whether statistical significance was present across both studies. The more of these standards that a replication effect meets, the stronger the case for replication. Table 7 concisely depicts these results.

Based on these findings, replication of the results found in Study 1 is most clear when examining trait interactions that predict SWL. Predicting SWL, both the extraversion by neuroticism interaction and the

agreeableness by neuroticism interaction met three of the four replication standards. A weaker, but still legitimate case can also be made for the conscientiousness by neuroticism interaction within SWL because both are in the same direction, and the CIs overlap. When trait interactions were used to predict AB, the extraversion by neuroticism and the agreeableness by neuroticism parameter estimates from Study 2 were in the opposite direction of those found in Study 1. This means that there is a fairly weak case (at least within this replication attempt) for the replicability of these effects from Study 1. A stronger case can be made for the conscientiousness by neuroticism effect, which met 3 of the 4 criteria for replication.

General Discussion

People with different personalities can experience the same life events or situations and come away with vastly different positive or negative experiences (Magnus et al., 1993). A long history of research linking SWB and personality has demonstrated how various personality traits are related to our subjective sense of well-being. Neuroticism has consistently been shown to have a negative relationship with SWB, while extraversion, agreeableness, and conscientiousness have been shown to have positive relationships (Costa & McCrae, 1980; DeNeve & Copper, 1998; McCrae & Costa, 1991). The current studies explored how the relationships between neuroticism and SWB can be moderated by other traits. Significant interactions among the personality traits and their relationship to SWB have been demonstrated and need to be considered and explored further in future research. As with previous studies, this study replicated results showing that neuroticism is inversely related to SWB through a negative correlation with both SWL and AB, while extraversion, agreeableness, and conscientiousness were positively related to SWB through a positive correlation with both SWL and AB. Neuroticism also showed a negative relationship with extraversion, agreeableness, and conscientiousness.

When interactions among traits were considered, the results from Study 1 indicated that only extraversion and conscientiousness moderated the relationship between neuroticism and SWL, and that conscientiousness and agreeableness moderated the relationship between neuroticism and AB. The meta-analysis by DeNeve and Copper (1998) theorized that neuroticism causes people to experience

less SWB overall. Our results show how this effect could be reduced through other personality traits. We found that the effect of positive personality traits on neuroticism was larger at higher levels of neuroticism compared to lower levels of neuroticism. Thus, as neuroticism increases, the observed effect of positive personality traits such as extraversion, agreeableness, and conscientiousness on the relationship between neuroticism and SWB becomes more pronounced.

Study 2 was designed to examine the replicability of the effects found in Study 1. The strongest case for replication can be made for the moderating effect of extraversion and the lack of moderation for agreeableness on the negative relationship between neuroticism and SWL. In both cases, three lines of evidence supported the results found in Study 1. There was also evidence for the moderating impact of conscientiousness. This suggests that, even in this different sample, the negative impact of neuroticism on SWL is less for individuals high in extraversion or conscientiousness, but is not significantly impacted by levels of agreeableness.

The impact of positive personality traits on neuroticism and AB relationships was mostly not replicated. In some cases (extraversion by neuroticism and agreeableness by neuroticism), the effects were in the opposite direction. The effects of the interaction of conscientiousness by neuroticism on AB were mostly replicated. There could be a number of explanations for these findings. First, the sample in Study 2 was about 15% of the size of the sample in Study 1, so it did not have as much power to detect small effects. Study 1 could detect effects as small as $f^2 = .011$, but Study 2 could only detect effects as small as $f^2 = .074$. Study 2 also collected data only from college students and had less diverse demographics than Study 1. A smaller and more homogenous sample could make it more difficult to detect effects due to lower variability. It is also important to keep in mind that college students differ from other adults in some important ways, such as being younger, and also differ from adults of the same age who have not gone to college in substantive ways such as a greater tendency to rationalize choices, higher levels of individualism, weaker motivations to conform, and less prosocial behaviors (Henrich et al., 2010). Future research on this topic would benefit from larger and more diverse samples to more directly examine how trait interactions are related to well-being across different age groups and groups

with different experiences (such as attending college).

Another potentially important difference between the studies is that Study 1 used the original BFI to assess personality traits, while Study 2 used the BFI-2. This may have made a difference in the two studies, but the two measures have high convergent validity and trait scores tend to be highly correlated between the two (Soto & John, 2017). For this reason, it is unlikely that this difference can account for the differences between the two studies.

Due to the larger sample size and greater diversity of the sample, Study 1 is a more reliable study and the results from Study 2 should be taken as only moderate evidence for the replicability, or lack thereof, of the findings. Overall, there is some evidence that positive personality traits can attenuate the negative relationship between neuroticism and SWB, specifically when it comes to SWL. Some of these differences could affect how personality is related to well-being, which would be a useful avenue for future research. Research also suggests that SWB is only one part of a broader construct of overall well-being (Chen et al., 2013) and research may benefit by further investigating the relationship between personality traits and psychological well-being.

One of the major limitations of this paper is that both studies are correlational and all measures were completed at only one time point, which means that cause-and-effect relationships cannot be identified. Additionally, both studies suffer from self-selection bias. The types of individuals who decided to devote time to completing psychological surveys on Mturk, and those who chose to take psychology classes, may not represent the broader population. Future research should look at these effects in multiple groups and over longer periods of time to investigate the temporal validity of the results and causal directions of the relationships between personality traits and well-being.

Conclusion

This research contributes to a more nuanced understanding of the complex interactions between well-being and personality. Often personality traits are treated as if they operate alone, but individuals are complex. For example, an agreeable extravert will likely act differently than an agreeable introvert, so it is important to examine how traits interact with each other to influence important psychological outcomes and behavior. The predictions made in this study that conscientiousness, extraversion, and agreeableness would moderate

the relationship between neuroticism and SWB were partially supported. Positive personality traits were generally positively related to SWB at high levels of neuroticism, but generally unrelated to SWB at low levels of neuroticism. This lends support to the idea that personality traits interact and highlights the importance of considering more than one trait at a time when predicting important outcomes such as SWB.

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PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

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Table 1*Descriptive Statistics and Zero-order Correlations for Study 1*

	Mean	SD	1	2	3	4	5	6
1. <i>Ext</i>	3.02	.90	-					
2. <i>Agr</i>	3.70	.72	.15 *** [.09, .21]					
3. <i>Con</i>	3.77	.75	.27 *** [.22, .33]	.37 *** [.32, .42]				
4. <i>Neu</i>	2.90	.85	-.34 *** [-.4, -.29]	-.36 *** [-.42, -.31]	-.5 *** [-.55, -.46]			
5. <i>SWL</i>	4.17	1.53	.22 *** [.16, .28]	.24 *** [.18, .29]	.3 *** [.24, .35]	-.38 *** [-.43, -.33]		
6. <i>AB</i>	1.34	1.40	.41 *** [.36, .46]	.42 *** [.37, .47]	.6 *** [.56, .64]	-.63 *** [-.67, -.60]	.47 *** [.42, .51]	
7. <i>Age</i>	37.28	12.66	.04 [-.02, .11]	.17 *** [.11, .23]	.23 *** [.18, .29]	-.22 *** [-.28, -.17]	.02 [-.04, .08]	.22 *** [.16, .28]
8. <i>Gen</i> [†]	-	-	-0.03 [-.09, .04]	0.18 *** [.12, .23]	0.11 *** [.05, .17]	0.11 *** [.05, .17]	0.05 [-.01, .11]	0.02 [-.04, .08]

Note. SWL = Satisfaction With Life, AB = Affect Balance, Ext = Extraversion, Agr = Agreeableness, Con = Conscientiousness, Neu = Neuroticism/Negative emotionality, Gen = Gender. $N = 1035$, values in brackets are the 95% confidence intervals.

** $p < .01$, * $p < .05$, †For gender, Male = 0 and Female = 1, non-binary individuals were excluded from the correlation matrix (but included in all other analysis) so that results could be interpreted properly ($N=1030$ for gender correlations).

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

Table 2

Hierarchical Regression Analyses Predicting Satisfaction with Life (SWL)

<i>Predictors</i>	<i>b</i>	<i>R</i> ²	<i>F</i>
<i>Step 1</i>		.156	95.14***
<i>Extraversion</i>	.17***		
<i>Neuroticism</i>	-.62***		
<i>Step 2</i>		.160	65.50***
<i>Extraversion x</i>	.12*		
<i>Neuroticism</i>	[.02, .21]		
<i>Step 1</i>		.157	95.95***
<i>Agreeableness</i>	.24***		
<i>Neuroticism</i>	-.61***		
<i>Step 2</i>		.158	64.31***
<i>Agreeableness x</i>	.06		
<i>Neuroticism</i>	[-.06, .18]		
<i>Step 1</i>		.160	98.93***
<i>Conscientiousness</i>	.28***		
<i>Neuroticism</i>	-.56***		
<i>Step 2</i>		.170	68.16***
<i>Conscientiousness x</i>	.15*		
<i>Neuroticism</i>	[.03, .27]		

Note. N= 1035, values in brackets are the 95% confidence intervals.

****p* < .001, ***p* < .01, **p* < .05.

Table 3*Hierarchical Regression Analyses Predicting Affect Balance (AB)*

<i>Predictors</i>	<i>b</i>	<i>R</i> ²	<i>F</i>
<i>Step 1</i>		.411.8	411.8***
<i>Extraversion</i>	.31***		
<i>Neuroticism</i>	-.84***		
<i>Step 2</i>		.444	274.3***
<i>Extraversion x Neuroticism</i>	.001 [-.06, .07]		
<i>Step 1</i>		.445	414.4***
<i>Agreeableness</i>	.40***		
<i>Neuroticism</i>	-.83***		
<i>Step 2</i>		.450	279.1***
<i>Agreeableness x Neuroticism</i>	.09* [.01, .18]		
<i>Step 1</i>		.508	599.4***
<i>Conscientiousness</i>	.64***		
<i>Neuroticism</i>	-.67***		
<i>Step 2</i>		.511	358.9***
<i>Conscientiousness x Neuroticism</i>	.09* [.01, .17]		

Note. N= 1035, values in brackets are the 95% confidence intervals.

*** $p < .001$, ** $p < .01$, * $p < .05$.

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

Table 4

Descriptive Statistics and Zero-order Correlations

	Mean	SD	1	2	3	4	5	6
1. Ext	3.39	.66	-					
2. Agr	3.84	.61	.13 [-.03, .28]					
3. Con	3.70	.66	.25** [.10, .40]	.32*** [.17, .46]				
4. Neu	3.06	.83	-.32*** [-.46, -.17]	-.28*** [-.42, -.12]	-.39*** [-.51, -.24]			
5. SWL	4.34	1.42	.31*** [.16, .45]	.25** [.09, .39]	.41*** [.27, .54]	-.49*** [-.60, -.36]		
6. AB	1.18	.96	.22** [.06, .36]	.26** [.10, .40]	.33*** [.18, .46]	-.45*** [-.57, -.32]	.38*** [.23, .51]	
7. Age	21.44	4.17	-.05 [-.20, .11]	-.02 [-.18, .14]	.07 [-.09, .23]	.01 [-.15, .17]	-.1 [-.26, .06]	-.07 [-.23, .09]
8. Gen [†]	-	-	0.03 [-.13, .19]	0.31 *** [.15, .44]	0.12 [-.05, .27]	0.07 [-.09, .23]	0.24 ** [.09, .39]	-0.04 [-.2, .12]

Note. SWL = Satisfaction With Life, AB = Affect Balance, Ext = Extraversion, Agr = Agreeableness, Con = Conscientiousness, Neu = Neuroticism/Negative emotionality, Gen = Gender. $N = 151$, values in brackets are the 95% confidence intervals.

** $p < .01$, * $p < .05$, †For gender, Male = 0 and Female = 1, non-binary individuals were excluded from the correlation matrix (but included in all other analysis) so that results could be interpreted properly ($N=149$ for gender correlations).

Table 5*Hierarchical Regression Analyses Predicting Satisfaction with Life (SWL)*

<i>Predictors</i>	<i>b</i>	<i>R</i> ²	<i>F</i>
<i>Step 1</i>		.268	27.15***
<i>Extraversion</i>	.37*		
<i>Neuroticism</i>	-.75***		
<i>Step 2</i>		.296	20.58***
<i>Extraversion x</i>	.42*		
<i>Neuroticism</i>	[.07, .76]		
<i>Step 1</i>		.257	25.53***
<i>Agreeableness</i>	.29		
<i>Neuroticism</i>	-.79***		
<i>Step 2</i>		.265	17.64***
<i>Agreeableness x</i>	.24		
<i>Neuroticism</i>	[-.13, .61]		
<i>Step 1</i>		.302	32.02***
<i>Conscientiousness</i>	.57***		
<i>Neuroticism</i>	-.67***		
<i>Step 2</i>		.318	22.79***
<i>Conscientiousness x</i>	.31		
<i>Neuroticism</i>	[-.03, .64]		

Note. Values in brackets are the 95% confidence intervals.

*** $p < .001$, ** $p < .01$, * $p < .05$

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

Table 6

Hierarchical Regression Analyses Predicting Affect Balance (AB)

<i>Predictors</i>	<i>b</i>	<i>R</i> ²	<i>F</i>
<i>Step 1</i>		.213	19.99***
<i>Extraversion</i>	.12		
<i>Neuroticism</i>	-.50***		
<i>Step 2</i>		.213	13.26***
<i>Extraversion x Neuroticism</i>	-.03 [-.28, .21]		
<i>Step 1</i>		.226	21.64***
<i>Agreeableness</i>	.23		
<i>Neuroticism</i>	-.48***		
<i>Step 2</i>		.248	16.16***
<i>Agreeableness x Neuroticism</i>	-.26* [-.52, -.01]		
<i>Step 1</i>		.234	22.64***
<i>Conscientiousness</i>	.26*		
<i>Neuroticism</i>	-.46***		
<i>Step 2</i>		.234	14.99***
<i>Conscientiousness x Neuroticism</i>	.01 [-.23, .25]		

Note. Values in brackets are the 95% confidence intervals.

****p* < .001, ***p* < .01, **p* < .05

Table 7*Lines of Evidence for the Replication in Study 2 of the Trait Interactions found in Study 1*

Trait interactions	Consistent direction	Overlapping CI	Study 2 <i>b</i> in Study 1 CI	Shared significance
Satisfaction With life				
Ext:Neur*	X	X		X
Agr:Neur	X	X		X
Con:Neur*	X	X		
Affect Balance				
Ext:Neur		X	X	X
Agr:Neur*				X
Con:Neur*	X	X	X	

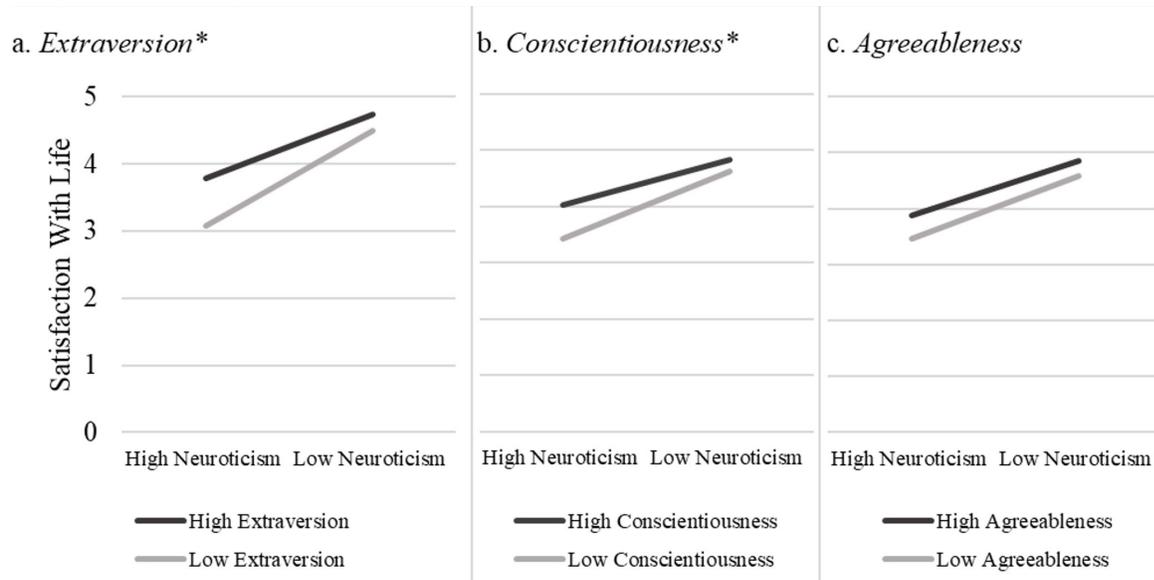
Note. CI = 95% confidence interval, Ext = Extraversion, Agr = Agreeableness, Con = Conscientiousness, Neur = Neuroticism/Negative emotionality. An X in the Shared significance column means that either both were significant, or both were not significant.

* $p < .05$ in Study 1.

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

Figure 1

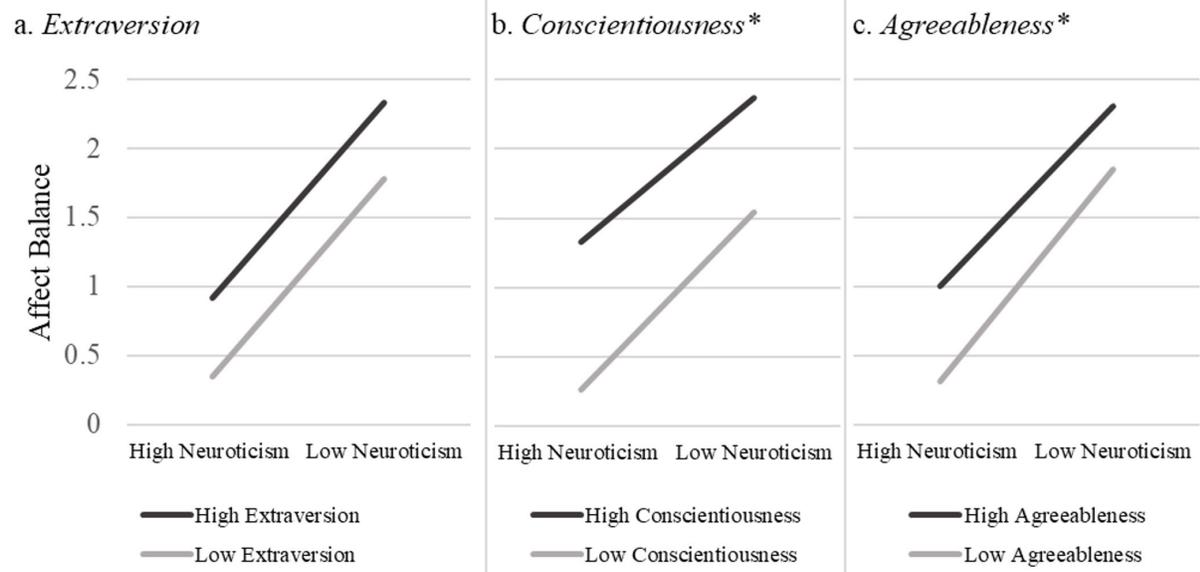
The Moderating Effect of Positive Traits on the Relationship Between Neuroticism and Satisfaction With Life



Note. *significant interaction effects.

Figure 2

The Moderating Effect of Positive Traits on the Relationship Between Neuroticism and Affect Balance

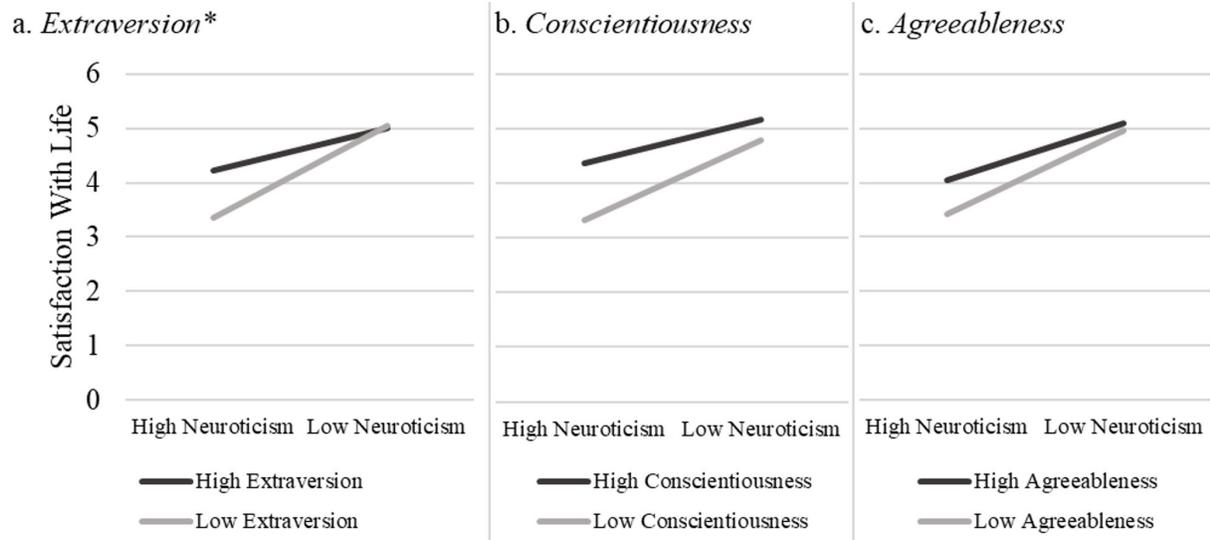


Note. *significant interaction effects.

PREDICTING SATISFACTION WITH LIFE AND AFFECT BALANCE

Figure 3

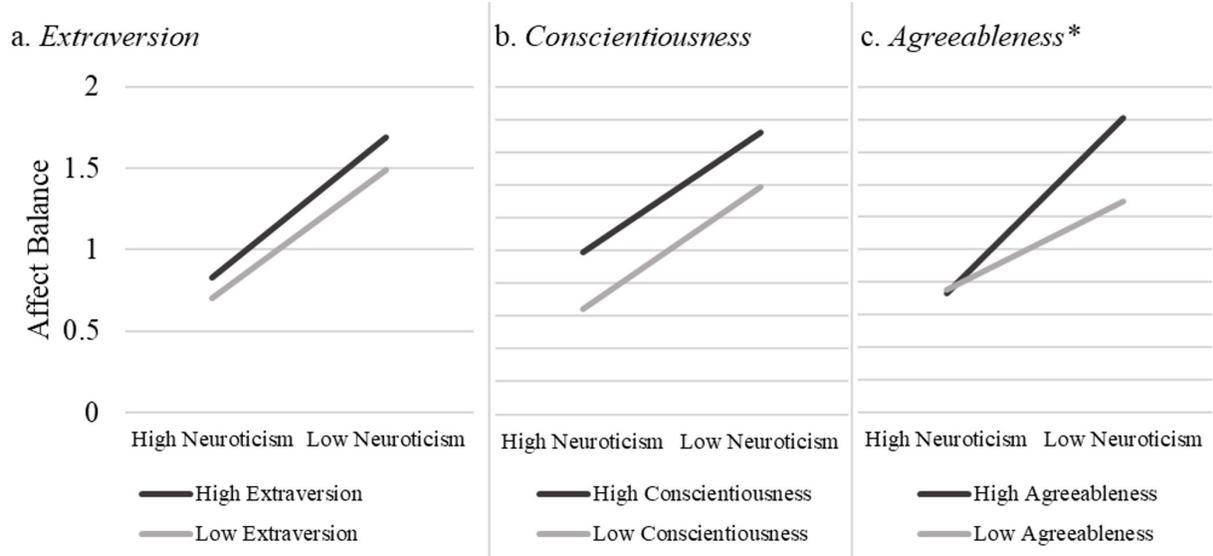
The Moderating Effect of Positive Traits on the Relationship Between Neuroticism and Satisfaction with Life



Note. *significant interaction effects.

Figure 4

The Moderating Effect of Positive Traits on the Relationship Between Neuroticism and Affect Balance



Note. *significant interaction effects.

Bouncing Back: Resilience, Aggression, and Depression in Older Gay Men and Lesbians

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Older gay men and lesbians are at greater risk for depression due to a lifetime of sexual minority stress (Fredriksen-Goldsen et al., 2013). For gay men and lesbians, depression is associated with aggression and relationship problems (Bernards & Graham, 2013). However, aggression may foster resilience if aggression is expressed in a healthy, nonviolent manner that motivates a person to take positive action towards a greater purpose (Russell & Richards, 2003). What are the relationships between aggression and resilience with depression in a sample of older gay men and lesbians; and do group differences exist? Data was collected from ($N=50$; Older gay men) and ($N=50$; Older lesbian women). SPSS 20 was used to run a multivariate analysis to test our overall model. Through a minority stress lens (Meyer, 1998), this study hypothesizes resilience moderates the relationship between aggression and depression. Significant differences between older gay men and older lesbians' aggression, resilience, and depression scores exist. For the older gay men and lesbian combined group, a moderation analysis indicated that in addition to aggression and resilience being single significantly predicted depression accounting for approximately 57% of the variance in depression. Furthermore, resilience significantly moderated the relationship between aggression and depression in the model in the sample ($N=100$) of older gay men and lesbians.

Keywords: Older Adult, Minority Stress, Resilience

Our study will examine how aggression, being single, and resilience are associated with depression in older gay men and lesbians, using resilience as a moderator. This study uses three groups to investigate group differences between older gay men and lesbians.

Background

In general, older adulthood is associated with stability, better problem-solving skills, psychological maturity, and wisdom (Mirowsky & Ross, 2001). However, older adulthood is also associated with financial strain, health-related issues, caregiving burdens, isolation, residential relocations, and bereavements of loved ones that negatively affect mental health in older adults (Moos, Schutte, Brennan & Moos, 2005; Pearlin & Skaff, 1996; Wight, Harig, Aneshensel & Detels, 2016). Older adults overwhelmed with age-related stressors may be at greater risk for mental distress and depression (Moos, Schutte, Brennan & Moos, 2005; Wight, LeBlanc, Meyer & Harig, 2015).

Depression and Sexual Minorities

While previous results report the prevalence of depression decreases with older age in the sexual majority population, older gay men and lesbians continue to face risks that may increase their vulnerability to mental health issues (Grossman et al., 2001). Fredriksen-Goldsen (2011) assessed the health risk factors of approximately 2,560 older gay men and older lesbians, between the ages of 50 to 95, and found an elevated risk of mental distress with approximately 31% of older gay men and lesbians reporting depression, 53% reported loneliness and 27% experienced the death

of a partner (Fredriksen-Goldsen, 2011). Similar to older sexual majority adults, older gay men and lesbians experience challenges associated with declines in health, loss of friends, and family and adjustments to retirement (Van Wageningen et al., 2013); however older gay men and lesbians also experience victimization related to their sexual minority status that older sexual majority adults do not (Fredriksen-Goldsen, 2012; Grossman, D'Augelli & O'Connell, 2001).

According to Meyer (1995), sexual minority stress is the chronic stress associated with sexual minority status and is different from normal day-to-day stress because it attacks an individual's identity. When an individual deals with multiple stressors at the same time the various stressors may strain coping resources (Meyer, 2015; Rook, 1998). Older gay men and lesbians matured in a time when hate, discrimination, victimization, and being labeled mentally ill were the norm, and overcoming adversity is a common theme in their development (Kuyper & Fokkema, 2010; Keuzenkamp & Bos, 2007). Overtime the abuse, discrimination, and sexual minority stress associated with sexual minority status may have long-lasting effects on the physical and mental health of older gay men and lesbians (Fredriksen-Goldsen et al., 2013; Hatzenbuehler, 2016).

Additionally, evidence links minority stress to structural and health inequalities which can negatively impact mental and physical health outcomes in older gay men and lesbians (Zeeman et al., 2019). Structural inequalities are evident in the legal, educational, business, government, and healthcare systems (Bentley, 2020). Structural inequalities are when a majority

group sets rules and laws that serve the majority, while minority groups have limited access to resources (Bentley, 2020). The interconnection of different identities and systems of oppression may impact older gay men and lesbians differently based on the beliefs of the majority groups (Herek, 2002). For example, one study found that participants were more likely to regard gay men as mentally ill and supported adoption rights for lesbians more than for gay men (Herek, 2002).

Even though previous researchers argue that men and women may have more similarities than differences, the intersectionality of gender, age, and sexual minority status may alter this theory (Hyde, 2014). Because structural social inequalities exist, gender and sexual minority status differences may be important determinants of health to consider (Denton & Walters, 1999). Therefore, models that investigate the intersectionality of gender and sexual minority status, rather than just controlling for sex, may be more effective in predicting health outcomes for older gay men and lesbians (Denton & Walters, 1999). Just controlling for sex may conceal the effects that sexual minority stress may have on health and hinder a more complete understanding of the effects different life experiences may have on health (Denton & Walters, 1999).

Furthermore, past studies focused more on collecting and interpreting data, rather than developing a model that will better explain the data (Coburn & Eakin, 1993). Combining older gay men and lesbians into one minority group will give us data to interpret; but without consideration of the intersectionality, our generalizations may not adequately apply to the population (Hyde, 2014). When the best model is considered for the data, better therapeutic interventions develop that are beneficial and are more likely to be effective for multiple determinants of health (Denton & Walters, 1999; Hyde, 2014).

Previous studies collapse older gay men and lesbians into a single sexual minority group, and gender differences within sexual minorities may exist and should be investigated (Fredriksen-Goldsen et al., 2010; Vosvick et al., 2010). For example, older gay men lived through and may have experienced personal trauma associated with the AIDS epidemic (Rosenfeld et al., 2012). The AIDS epidemic is a defining moment because many older gay men experienced trauma associated with the death of friends and partners, while others had to learn how to cope

with living with HIV/AIDS (Rosenfeld et al., 2012).

On the other hand, findings suggest depression is equally a concern for lesbians (Bradford et al., 1994; Tait, 1997). In general, 25% of women experience depression in their lifetime (Salk et al., 2017) because of several economic, social, biological, and emotional factors (Reiss, 2013), with lesbians carrying an extra burden because of sexual minority status (Bostwick et al., 2019). Concealment of sexual identity, lack of employment, living in a rural area, and being single are all factors associated with depression for older lesbians (Oetjen & Rothblum, 2000).

Relationship Status and Depression

For older gay men and lesbians, as well as the sexual majority of older adults, having a supportive partner is associated with a greater sense of well-being, positive physical health outcomes, and reported lower scores on loneliness and depressive symptoms (Grossman et al., 2001; Herek, 2006). For example, a longitudinal study reported older gay men and lesbians that reported being divorced/separated had poorer health and more depressive symptoms than those who were married (Luo et al., 2012).

Aggression and Sexual Minorities

Aggression is defined as overtly hurtful behavior towards a target in the form of verbal aggression (insults, sarcasm, and rudeness) or physical harm (Ramirez & Andreu, 2006). Previous results suggest verbal aggression is more common (Björkqvist, 2018). Researchers hypothesized that aggression may stem from exposure to different stressors and negative life experiences (Finch & Graziano, 2001). Therefore, older gay men and lesbians who have experienced discrimination, victimization, and sexual minority stress may be at an increased risk for aggression (Silove, 2009). While aggression might be an understandable reaction to mistreatment, it may be potentially destructive (Offredi, 2016; Painuly et al., 2005) if the emotional expression is internalized or externalized (Bridewell & Chang, 1997). Conversely, Russell & Richards (2003) reported aggression associated with anti-gay politics, may foster resilience if the aggression is expressed in a healthy manner that motivates a person to take positive action towards a greater purpose. Negative emotions associated with discrimination may exist concurrently with taking positive initiative because aggression may motivate collective action that promotes feelings of empowerment (Foster, 2000).

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

However, group differences in older gay men's and lesbians' aggression may exist. For example, depressed women report more verbal aggression than depressed men (Zuckerman, 1989). Averill (1983) and Frank, Carpenter, and Kupfer (1988) reported women to become verbally aggressive as often, as intensely, and for similar reasons as men. A different study reported women may have greater difficulty expressing their anger; and may suppress their emotions (Kopper & Epperson, 1996). While some studies found no gender differences in aggression (Im et al., 2018).

Furthermore, aggression is positively associated with relationship problems and separation (Bernards & Graham, 2013) especially if the aggression is uncontrollable (Baron et al., 2007; Offredi, 2016). Goldman & Hagga (1995) reported depressed individuals express more aggression towards their partner when compared to non-depressed individuals (Painuly et al., 2005).

Resilience and Sexual Minorities

Even though current research reports being a sexual minority is associated with negative mental health outcomes, most older gay men and lesbians successfully cope with sexual minority stress (Fredriksen-Goldsen et al., 2017; Kaufman & Compton, 2021). Resilience in current literature has several different definitions, however, this study will define resilience as the ability to 'bounce back' from adversity (Colpitts & Gahagan, 2016; Herrick et al., 2014). Resilience is not a born trait, nor a skill that enables individuals to be resilient to all situations (Bonanno & Burton, 2013). Instead, resilience is a dynamic process that involves internal processes, external and environmental factors, and the specific strategies executed by an individual (Richardson & Waite, 2002). Although, these strategies may change over a lifespan based on the challenge and resources available (Bonanno & Burton, 2013; Fletcher & Sarkar, 2013). Additionally, resilience is associated with positive health outcomes, well-being, life satisfaction, adaptive coping skills, and a decreased risk of depression (Hash & Rogers, 2013; Wagnild, 2003).

Previous research collapsed older gay men and lesbians into a single sexual minority group; however, differences in resilience by gender should not be overlooked. For example, many older gay men learned self-reliance, survival skills, stress management, and how to care for themselves earlier in life and may adjust to older adulthood more successfully than sexual majority men (Hash & Rogers, 2013;

Wight et al., 2012). Unfortunately, there is limited literature on older lesbians and resilience, however, older lesbians generally have increased social support and are less likely to live alone when compared to older gay men (Fredriksen-Goldsen et al., 2013).

Older gay men and lesbians may experience internalized aggression due to a lifetime of sexual minority stress and level of resilience may predict older gay men and lesbians' ability to 'bounce back' from adversity (Snyder et al., 1991). Additionally, unique experiences of structural social inequalities may impact older gay men and lesbians differently (Denton & Walters, 1999). Therefore a model that investigates these two groups separately will better explain our data (Coburn & Eakin, 1993).

Purpose of Present Study

Through a minority stress lens, this study will examine what the relationships are between aggression, being single, resilience, and depression in older gay men and lesbians, and the group differences (Meyer, 2003). This study hypothesizes aggression and being single are positively associated with depression. Resilience will be negatively associated with depression. Aggression, resilience and being single will account for a significant proportion of variance in depression. Resilience will moderate the relationship between aggression and depression. A significant difference between older gay men's and older lesbians' aggression, resilience, and depression scores will exist.

Method

Procedures

After appropriate institutional review board approval was obtained, signed informed consent forms were obtained from all participants. The computerized self-report surveys were provided by the CPHR research team. Participant identity was completely anonymous, and the participants received an incentive of \$25.

Participants

Our NIH-certified research assistants administered a self-report survey to 50 gay cis-men and 50 cis-gender lesbians, 50 years of age and older ($N = 100$), living in the Dallas/Ft Worth (DFW) Metroplex and fluent in English. The CPHR team recruited participants from a variety of places in DFW, including local bars, LGBT-friendly churches, the Gay Pride Parade, community-based social groups, online social media, and professional organizations.

This study will investigate three groups: an older gay men and lesbian combined group, an older gay men only group, and an older lesbian only group. Please see Tables 1, 2 & 3 near here for demographics.

Measures

Participants completed a demographic questionnaire that assessed age, sex, ethnicity, sexual minority status, relationship status, etc. as well as a battery of other psychosocial measures. The Center for Epidemiologic Studies Depression Scale (CESD), The Aggression Questionnaire (AQ), and The Connor-Davidson Resilience Scale (CD-RISC) were used for this study.

The Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1977) is a 20-item measure that assesses the frequency of depressive symptoms. This measure consists of a four-point Likert-type scale ranging from '0-Rarely or none of the time' to '3-Most or almost all of the time'. The overall scale has strong internal consistency with reported Cronbach's alpha of .90 and adequate concurrent and construct validity.

The Aggression Questionnaire (AQ; Buss & Perry, 1992) is a 29-item measure of aggression and includes 4 subscales that measure aspects such as physical aggression, verbal aggression, anger, and hostility. The AQ consists of a five-point Likert-type scale that ranges from '1-Extremely uncharacteristic of me' to '5-Extremely characteristic of me'. The AQ has good reliability with a reported Cronbach's alpha of .80 and adequate convergent and concurrent validity.

The Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003) is a self-report measure of resilience. This measure consists of 25 items on a 5-point Likert-type scale ranging from '0-Not at all true' to '4-True nearly all of the time'. High scores reflect greater resilience. This instrument has a reported Cronbach's alpha of .89 and demonstrates high convergent validity.

Results

G*power software was used to run a power analysis. Data was collected by The Center for Psychosocial Health Research and SPSS 20 to analyze the data. Prior to the data analyses, a missing data analysis was conducted using Little's MCAR test and no missing data was found. A frequency table to screen for outliers and found that all values were within normal range, except for an education value of 55 years. The median was used instead of the mean for education because

of an outlier value in Table 1. Normality plots were used to check that assumptions for a normal distribution were met. Because our data did not meet the assumption of normality, Log was used to transform the data for aggression and depression for the older gay men and lesbians combined group, the older gay men-only group, and the older lesbian-only group.

Univariates Analysis

Complete data was collected from all our 100 participants and then conducted univariate statistical analyses on all three groups to calculate means, standard deviations, ranges, and alphas for each measure and groups are shown in Tables 4, 5 & 6.

Bivariate Analysis

Bivariate data analyses were conducted, to assess the strength of the relationships between our demographic variables and our variables of interest for the older gay men and lesbian combined group, older gay men-only group, and older lesbian-only group. The correlations are presented in Tables 7, 8 & 9

T-Test Analysis

An independent-sample t-test was conducted to compare the total scores of each variable based on the group to determine any significant differences between older gay men and older lesbians. Our t-test results indicated a significant difference ($t [98] = -3.25, p = .002$) between resilience scores for gay men ($M = 69.56, SD = 21.00$) and lesbians ($M = 80.80, SD = 12.60$) and for depression scores ($t [98] = 2.90, p = .005$) for gay men ($M = 11.32, SD = 8.23$) and lesbians ($M = 7.26, SD = 5.51$). However, aggression scores ($t [98] = 1.91, p = .060$), for gay men ($M = 25.16, SD = 15.69$) and lesbians ($M = 19.62, SD = 13.28$) were not significantly different. In our sample, older gay men significantly reported lower resilience scores (Cohen's $d = 0.65$) and higher depression scores (Cohen's $d = 0.60$) than older lesbians, indicating medium effect sizes.

Multivariate Analysis: Moderation Analysis

For the multivariate analyses, three moderation analyses were conducted, to test our overall model, using the older gay men group, and lesbian combined group, the older gay men-only group and the older lesbian-only group to examine which of our variables of interest serve as predictors of depression, as well as, if resilience moderates the relationship between aggression and depression. The results are shown in Tables 10, 11 & 12. {near here}.

The first moderation analysis (Table 10- Moder

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

ation Analyses of older gay men lesbians combined); ($F [4, 95] = 34.10, [\Delta] R^2 = .15, p < .001$) indicated that in addition to aggression ($\beta = .30, p < .001$) and resilience ($\beta = -.69, p < .001$), being single ($\beta = .31, p < .001$) significantly predicted depression accounting for approximately 57% of the variance in depression (Adj. $R^2 = .57, p < .001$). Furthermore, resilience significantly moderated the relationship between aggression and depression ($\beta = -.55, p < .05$) in our model, $\Delta R^2 = .15, F$ change = 34.93, $p < .001$, in our sample ($N = 100$) of older gay men and lesbians.

The second moderation analysis (Table 11- Moderation Analyses of the older gay men-only group); ($F [4, 45] = 16.92, [\Delta] R^2 = .10, p < .001$) indicated that aggression ($\beta = .33, p < .001$) and resilience ($\beta = -.53, p < .001$) significantly predicted depression accounting for approximately 57% of the variance in depression. Furthermore, resilience significantly moderated the relationship between aggression and depression ($\beta = -.33, p < .05$) in our model, $\Delta R^2 = .10, F$ change = 11.02, $p < .001$, in our sample ($N = 50$) of older gay men. However, being single was a significant predictor of depression in blocks 1 & 2 ($\beta = .38, p < .05$) ($\beta = .22, p < .05$), but in block 3 it fell out of significance when the interaction effect was added to the model ($\beta = .19, p < .058$).

The third moderation analysis (Table 12- Moderation Analyses of the older lesbian-only group), ($F [4, 45] = 15.51, [\Delta] R^2 = .03, p < .001$) indicated that being single ($\beta = .42, p < .001$) and resilience ($\beta = -.40, p < .001$) significantly predicted depression accounting for approximately 54% of the variance in depression (Adj. $R^2 = .54, p < .001$). However, aggression was not a significant predictor of depression ($\beta = .13, p = .228$) therefore resilience did not moderate the relationship between aggression and depression ($\beta = -.18, p = .100$) in our model, $\Delta R^2 = .03, F$ change = 2.82, $p < .001$, in our sample ($N = 50$) of older lesbians. The variance inflation factors (VIF) and tolerance (TOL) were examined with each analysis to check for multicollinearity and found none.

Discussion

This study investigated the relationships between aggression, being single, resilience, and depression in three groups: older gay men and lesbians combined, older gay men-only group, and older lesbian-only group. These three groups were chosen because older gay men and lesbians' life experiences may differ and

by combining them into a single group, important differences may be missed; and three models better explained the data (Coburn & Eakin, 1993). For all three groups, this study hypothesized that aggression and being single are positively associated with depression, and resilience is negatively associated with depression. This study also hypothesized that aggression, being single and resilience account for a significant proportion of variance in depression; and that resilience moderates the relationship between aggression and depression.

Older Gay Men and Lesbians Combined Group

For the older gay men and lesbian combined group, our results support all our hypotheses. In our sample of older gay men and lesbians, being single was a significant predictor of depression which supports previous literature that single older gay men and lesbians reported a sense of emptiness in their lives because of a lack of companionship (Kuyper & Fokkema, 2010). When compared to partnered older sexual minorities, single older sexual minorities reported an increase in depressive symptoms (Fredriksen-Goldsen & Mura-co, 2010). Having a spouse or partner may be a valuable source of companionship and emotional support (Cutrona, 1996). Additionally, when compared to single older gay men and lesbians, partnered older gay men and lesbians reported more positive attitudes towards aging and improved well-being (Heaphy, 2009).

In our sample of older gay men and lesbians combined, aggression was a significant predictor of depression. This finding is consistent with previous literature that aggression in older gay men and lesbians is positively associated with negative mental outcomes such as depression (Mason et al. 2014; Parham, 2004). While aggression may be a common reaction to human rights violations (Silove et al., 2009) when expressed outwardly in a nonproductive manner aggression is considered a maladaptive coping strategy (Miller et al., 1996) associated with increased depressive symptoms in both gay men and lesbians (Kopper & Epperson, 1996). However, aggression expressed in a manner that motivates an individual to take positive action towards a greater good is associated with adaptive coping (Russell & Richards, 2003).

Resilience was also a significant predictor of depression in our sample of older gay men and lesbians combined. This finding supports previous research that indicates, resilience is associated with positive health outcomes, well-being, life satisfaction, adap

tive coping skills, and a decreased risk of depression (Wagnild, 2003; Wagnild & Young, 1993). Even though older gay men and lesbians experienced a lifetime of adversity, the majority are not only able to “bounce back” from adversity but may develop more adaptive coping strategies which are associated with increased resilience (Hill & Gunderson, 2015).

Furthermore, resilience significantly moderated the relationship between aggression and depression in our sample of older gay men and lesbians combined. This finding supports previous research that indicates, resilient older gay men and lesbians may possess characteristics that allow them to confront and overcome obstacles and challenges (Snyder et al., 1991). Even if they feel anger or aggression towards events of discrimination, negative emotions can exist concurrently, and be associated with increased resilience, if aggression motivates an individual to express their emotions in a constructive manner or take positive action towards a greater good (Foster, 2000).

Older Gay Men-Only Group

Next for our second model, the older gay men-only group, our results support our hypotheses, except being single was not a significant predictor of depression when the interaction effect was entered into the model, which indicated a difference from the results of the older gay men and lesbian combined group. This finding is consistent with previous literature that aggression in marginalized groups is associated with depression and other negative mental health outcomes (Mason et al. 2014; Parham, 2004).

Resilience was also a significant predictor of depression in our older gay men only group. This finding supports previous research that greater resilience is associated with greater well-being, life satisfaction, and decreased risk of depression (Fredriksen-Goldsen & Muraco, 2010; King & Orel, 2012). Furthermore, resilience significantly moderated the relationship between aggression and depression in our older gay men-only group. Possibly because emotional openness and the ability to accept and process emotions in an insightful manner was reported as a factor associated with resilience (Kwon, 2013).

However, being single for older gay men did not significantly predict depression in our sample, once the interaction effect was added to the model, although being single did approach significance. This may be due to our sample size.

Older Lesbians-Only Group

Then for our model with the older lesbians-only group, our results support our hypotheses, except aggression was not a significant predictor of depression thus resilience did not significantly moderate the relationship between aggression and depression. In our sample of older lesbians, being single was a significant predictor of depression. This finding is consistent with previous literature that reports lesbians in a supportive relationship report higher self-esteem and decreased depressive symptoms when compared to single lesbians (Wayment & Peplau, 1995).

Resilience was also a significant predictor of depression in our sample of older lesbians which is consistent with previous research (Averett et al., 2011). Many older lesbians have strong social networks, advocate for the lesbian community, and are less likely to live alone when compared to older sexual majority women and older gay men (Averett et al., 2011). However, aggression was not a significant predictor of depression possibly because of the restriction in the range of aggression. A subscale of aggression is physical aggression and individuals may fail to endorse these items due to social desirability.

Because the experiences of older gay men and lesbians can be quite different an independent-samples t-test was conducted. Significant differences were found between resilience scores for older gay men and lesbians, with older gay men reporting lower resilience than older lesbians. This result may be due to the fact that gay men are more likely to live alone and less likely to have a partner when compared to older lesbians (Fredriksen-Goldsen, 2011).

Furthermore, depression scores for gay men and lesbians were also significantly different with older gay men reporting more depressive symptoms. This finding suggests older gay men might experience more adverse effects of sexual minority stress than older lesbians (Herek, 2002). However, aggression scores for gay men and lesbians were not significantly different. Previous literature shows mixed results for gender differences in aggression in the sexual majority (Allen & Haccoun, 1976; Averill, 1982). No significant difference may suggest that some lesbians experience similar aggression as gay men (Parham, 2004).

Group Differences

At the t-test level, the results indicated significant differences between resilience and depression with older gay men reporting lower resilience and higher depression. Older gay men report more internalized homophobia than older lesbians (Fredriksen-Goldsen, 2011), possibly because society is more accepting of lesbians than gay men (Heaphy, 2009).

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Lastly, resilience was the strongest predictor of depression for older gay men, while being single was the strongest predictor of depression for older lesbians. These results highlight the importance of investigating older gay men and lesbians in separate models. Important differences would have been missed had this study combined the groups into one model, as does most current literature.

Conclusion

This study examined how aggression, being single, and resilience are associated with depression in older gay men and lesbians, using resilience as a moderator. This study used three groups to investigate group differences between older gay men and lesbians. Significant differences between older gay men and older lesbians' aggression, resilience, and depression scores did exist. The older gay men and lesbian combined group, indicated that in addition to aggression and resilience, being single significantly predicted depression. Furthermore, resilience significantly moderated the relationship between aggression and depression in older gay men and lesbians.

Clinical Implications

Because older gay men and lesbians experience a lifetime of sexual minority stress (Meyer, 2003), clinicians should focus on interventions aimed at transforming aggression into motivation for self-advocacy. Therapeutic interventions should promote adaptability, self-reliance, advocacy skills, proactive coping, self-care, spirituality, gender role flexibility, hope, and hardiness; all of which are reported to foster greater resilience (Craig et al., 2014; Colpitts & Gahagan, 2016). Also, a further understanding of what factors predict resilience in the older gay and lesbian community may help clinicians develop better therapeutic interventions.

Limitations

While this was a challenging sample to recruit, this study achieved the needed sample size but acknowledges this sample has limited generalizability. A more diverse sample size would provide an in-depth understanding of the intersectionality of oppression based on different minority identities. Because this was a computerized study taken on provided computers, there were limitations in the ability to reach a more socioeconomically and ethnically diverse sample. As with any self-report survey, some responses may be influenced by self-report bias and social desirability. Also, because our sample is from Texas

our results may not generalize to older gay men and lesbians living in more liberal states. Finally, due to correlational design causation cannot be inferred.

Future Research

Future researchers should investigate factors that predict resilience in older gay men and lesbians. Researchers should also compare resilience, aggression, and depression in a sample that is representative of the older transgender and bisexual population as well as one that is more ethnically diverse. Also, due to limited current literature on the gender differences of sexual minorities, future research should investigate the group differences between gay men and lesbians.

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RESILIENCE MODERATES AGGRESSION AND DEPRESSION

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RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Table 1*Demographics of Older Gay Men and Lesbian Group Combined*

Variable	N	M (SD)	Range
Age		59.0 (6.5)	50-81
Lesbian	50		
Gay Men	50		
European American	68		
African American	17		
Latinx	8		
Asian American, biracial, other	7		
Single	42		
Partnered	58		
Education		16* (6.4)	8-55

Note. *median.

Table 2*Demographics of Older Gay Men Only Group*

Variable	N	M (SD)	Range
Age		59.0 (6.5)	50-81
Gay Men	50		
European American	28		
African American	13		
Latinx	4		
Asian American, biracial, other	5		
Single	28		
Partnered	22		
Education		16* (5.0)	8-55

Note. *median.

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Table 3*Demographics of Older Lesbian Group Combined*

Variable	N	M (SD)	Range
Age		60.1 (5.6)	50-71
Lesbian	50		
European American	40		
African American	4		
Latinx	4		
Asian American, biracial, other	2		
Single	14		
Partnered	36		
Education		16.4 (2.9)	12-26

Note. *median.

Table 4*Univariates for Older Gay Men and Lesbians Group Combined*

Variable	M (SD)	Possible Range	Actual Range
Aggression	22.4 (14.7)	0-116	3-62
Resilience	75.2 (18.1)	0-100	0-100
Depression	9.3 (7.3)	0-60	4-36

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Table 5

Univariates for Older Gay Men Only Group

Variable	M (SD)	Possible Range	Actual Range
Aggression	25.2 (15.7)	0-116	4-62
Resilience	69.6(21.0)	0-100	0-100
Depression	11.3 (8.2)	0-60	4-36

Table 6*Univariates for Older Lesbians Only Group*

Variable	M (SD)	Possible Range	Actual Range
Aggression	19.6 (13.3)	0-116	3-50
Resilience	80.8 (12.6)	0-100	30-100
Depression	7.3 (5.5)	0-60	4-36

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Table 7

Bivariate for Older Gay Men and Lesbians Combined Group

	1.	3.	4.	5.	6.	7.	8.
1. Age	-						
2. Lesbians	.18	-					
3. African American	-.19	-					
4. Latinx & Other	.08	-.19	-				
5. Single	.01	.10	.04	-			
6. Education	.05	-.13	-.05	-.07	-		
7. AQ	.12	.10	.02	.23*	.18	-	
8. CD-RISC	.10	.01	.06	-.23*	-.00	-.05	-
9. CESD	-.07	.09	-.07	.47**	-.02	.43**	-.37**

05*; $p < .001$ **

Table 8*Bivariate for Older Gay Men-Only Group*

	1.	2.	3.	4.	5.	6.	7.
1. Age	-						
2. African American	-.29*	-					
3. Latinx & Other	-.03	-.28	-				
4. Single	.02	-.07	.11	-			
5. Education	.03	-.18	-.06	.01	-		
6. AQ	-.04	-.17	.02	.12	.24	-	
7. CD-RISC	.22	.06	.18	-.24	-.12	-.16	-
8. CESD	-.17	-.01	-.18	.38**	-.01	.44**	-.59**

<.05*; $p < .001$ **

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Table 9

Bivariate for Older Lesbians-Only Group

	1.	2.	3.	4.	5.	6.	7.
1. Age	-						
2. African American	.13	-					
3. Latinx & Other	.28	-.19	-				
4. Single	.18	.10	.04	-			
5. Education	.10	-.13	-.06	-.07	-		
6. AQ	.40**	.41**	-.01	.26	.10	-	
7. CD-RISC	-.35*	.10	-.17	-.22	.07	-.25	-
8. CESD	.22	.12	.11	.57**	-.20	.31*	-.58**

p<.05*; *p*<.001**

Table 10*Moderation Analysis Older Gay Men and Lesbians Depression is the Outcome Variable*

Model	Variable	β	t	p	Tol	Vif
1	Single	.51	5.91	.000	1.00	1.00
2	Single	.37	4.63	.000	.90	1.11
	Aggression	.31	3.95	.000	.95	1.06
	Resilience	-.30	-3.79	.000	.95	1.05
3	Single	.31	4.43	.000	.95	1.06
	Aggression	.30	4.50	.000	.88	1.14
	Resilience	-.69	-7.30	.000	.48	2.09
	Aggression x Resilience	-.55	-5.91	.000	.50	1.99

Note. Adj. $R^2 = .57$, $F(4, 95) = 34.10$, $(\Delta) R^2 = .15$, $p < .001$

* $p < .05$, ** $p < .01$.

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Table 11

Moderation Analysis Older Gay Men Only Depression is the Outcome Variable

Model	Variable	β	t	p	Tol	Vif
1	Single	.38	2.86	.007	1.00	1.00
2	Single	.22	2.09	.040	.93	1.07
	Aggression	.38	3.61	.001	.93	1.08
	Resilience	-.43	-4.00	.000	.97	1.03
3	Single	.19	1.95	.058	.92	1.08
	Aggression	.33	3.40	.001	.85	1.17
	Resilience	-.53	-5.17	.000	.94	1.06
	Aggression x Resilience	-.33	-2.32	.002	.91	1.10

Note. Adj. $R^2 = .56$, $F(4, 45) = 16.92$, $(\Delta) R^2 = .10$, $p < .001$

* $p < .05$, ** $p < .01$.

Table 12*Moderation Analysis Older Lesbian Group Depression is the Outcome Variable*

Model	Variable	β	t	p	Tol	Vif
1	Single	.57	4.86	.000	1.00	1.00
2	Single	.46	4.40	.000	.91	1.10
	Aggression	.08	.72	.478	.89	1.12
	Resilience	-.46	-4.50	.000	.91	1.09
3	Single	.42	4.09	.000	.88	1.14
	Aggression	.13	1.22	.228	.81	1.24
	Resilience	-.40	-3.74	.001	.81	1.24
	Aggression x Resilience	-.18	-1.68	.100	.81	1.24

Note. Adj. $R^2 = .54$, $F(4, 45) = 15.51$, $(\Delta) R^2 = .03$, $p < .001$

RESILIENCE MODERATES AGGRESSION AND DEPRESSION

Figure 1

Simple Slope Analysis for Older Gay Men Aggression and Depression

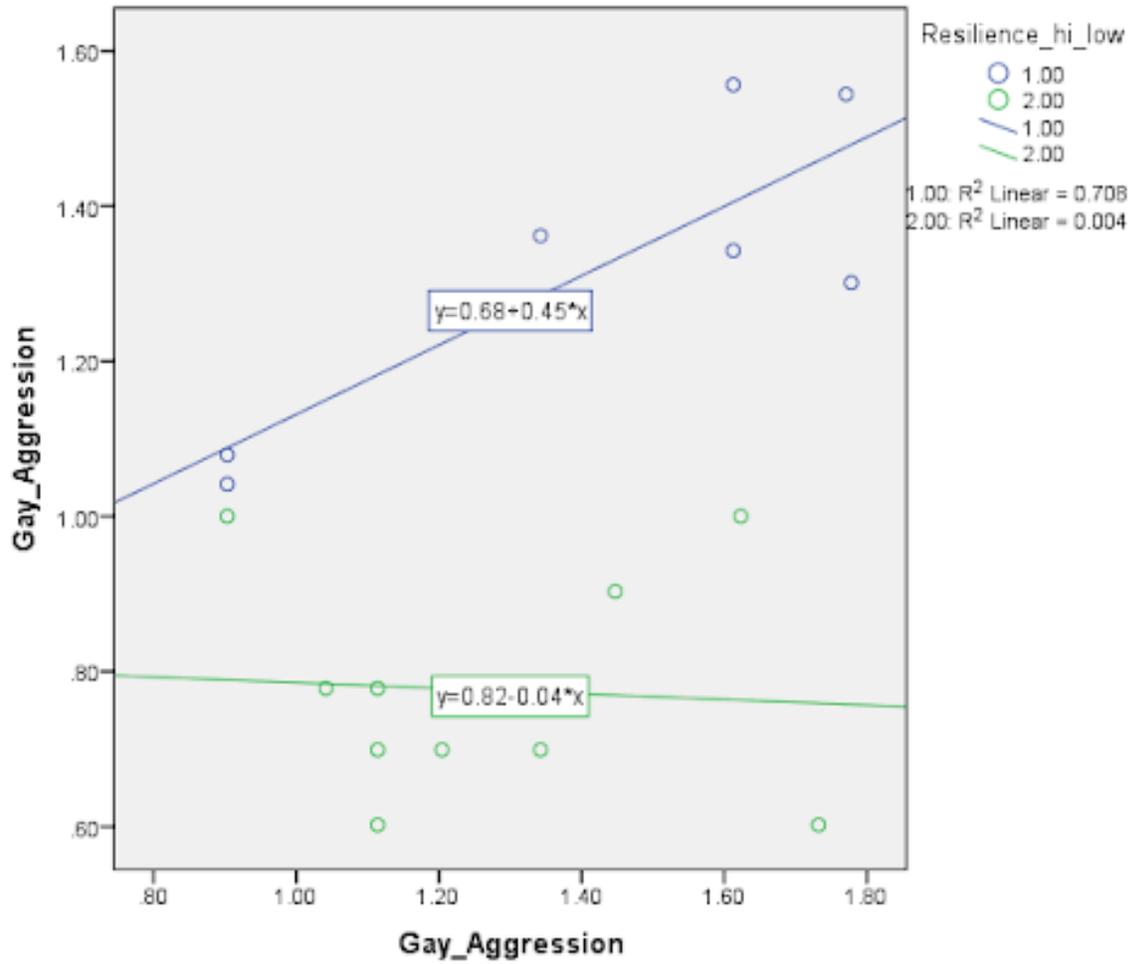
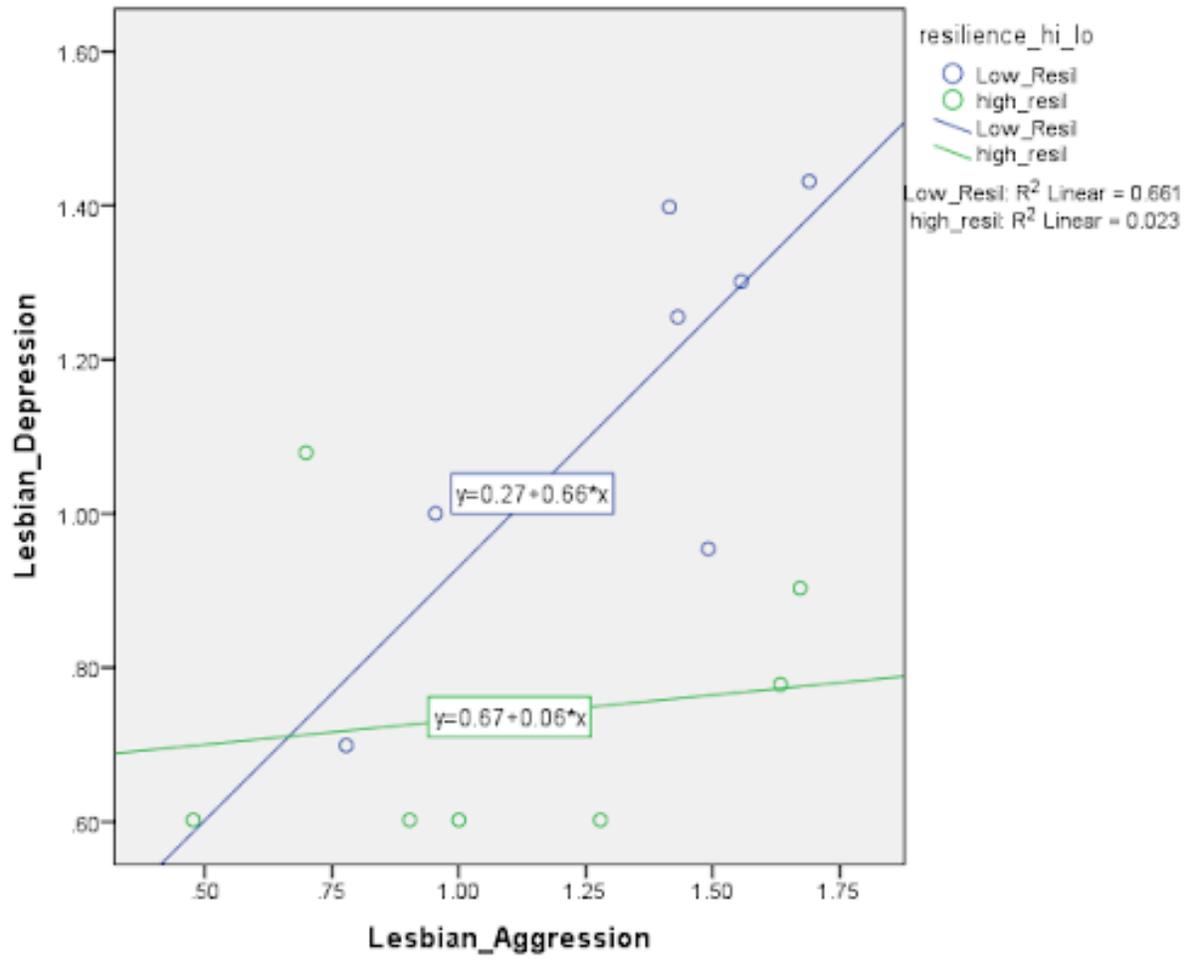


Figure 2

Simple Slope Analysis for Older Lesbians Aggression and Depression



Educating College Students about Dating Violence Bystander Behaviors: Evaluating an Innovative Animated Intervention

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Due to the extensively social nature of college campuses, peer intervention is a valuable tool for the reduction of college dating violence. While bystander training programs are becoming a common tool for addressing student welfare concerns on college campuses, there is little research evaluating the efficacy of these interventions. The purposes of this study were to revise an online bystander intervention program (*STOP Dating Violence*; O'Brien et al., 2021) and conduct a randomized controlled trial to test the effectiveness of this revised intervention. Specifically, the intervention was modified and converted into an engaging animated video and then tested for its effectiveness. College students (N=335) were randomly assigned to one of three conditions: (1) the *STOP* intervention, (2) a website containing information about dating violence, and (3) a control condition. Students who viewed the *STOP Dating Violence* video intervention had the greatest knowledge of bystander interventions when compared to the website and control conditions. Thus, the *STOP Dating Violence* video has potential to successfully educate undergraduates about appropriate bystander interventions for dating violence in a cost-effective manner.

Keywords: dating violence, college students, online intervention, bystander

Dating violence, or the threat or presence of physical, emotional, sexual, financial, or cyber abuse in a romantic relationship, affects college students at distressing rates, with between 10% and 50% experiencing at least one form of dating violence (Kaukinen, 2014). Such violence puts those who experience dating violence at high risk for substance abuse, suicidality, risky sexual behavior, and eating disorders (Rakovec-Felser, 2014). Researchers pointed to the primacy of peers, substance use, limited relationship experience, being away from home, and the ubiquity of social media as significant in the perpetuation of dating violence on college campuses (Duval et al., 2020; Libertin, 2017). To reduce dating violence on college campuses, bystander intervention programs have been developed to teach students how to identify dating violence and intervene effectively (Banyard et al., 2007; Moynihan & Banyard, 2008). The purposes of this study were to revise an online bystander intervention educational program (*STOP Dating Violence*; O'Brien et al., 2021) and to conduct a randomized controlled trial to test the effectiveness of the revised intervention. Specifically, the *STOP Dating Violence* intervention was converted into an engaging animated video format and then tested for its effectiveness. Ultimately, this intervention could reduce rates of dating violence on college campuses.

Theoretical Framework

The Model of Bystander Behavior (Latane & Darley, 1970) provides the theoretical foundation for this study. A bystander is defined as any person who

witnesses or learns of an incident of dating violence. Bystander behavior is engagement in actions to stop a given behavior. The individual and cultural impact of bystander behaviors is understood by sociologists as a kind of feedback loop in which individual people are shaped by the way that they participate in social systems, which in turn shapes the systems themselves (Katz et al., 2011). Bystander behaviors are spread through college student's social networks, ultimately resulting in community-level changes in social norms (Coker et al., 2015). Moreover, when bystander behaviors are not performed, bystanders implicitly reinforce abusive behavior (Katz et al., 2011).

The Model of Bystander Behavior (Latane & Darley, 1970) described the contingencies that are required for bystanders to become involved: bystanders must be aware of the problematic situation, perceive it as an emergency, decide that they have a responsibility to take action, and determine what help they are able to provide. Also, multiple psychological processes may impede bystander interventions, such as diffusion of responsibility (i.e., bystanders believing that others will bear the responsibility for intervention), evaluation apprehension (i.e., bystanders worrying about acting in ways that may harm their reputation in the eyes of other bystanders like offering to help a victim and having the victim's boyfriend be angry or think poorly of the bystander), and pluralistic ignorance (i.e., bystanders believing that dating violence situations are not emergencies based on the inaction of

other bystanders who are witnessing the abusive interaction; Latane & Darley, 1970). Theory suggests that bystanders are more likely to report engaging in bystander behaviors if they feel a greater sense of responsibility and self-efficacy, and believe that the benefits of intervening outweigh the costs (Jouriles et al., 2016).

Another relevant theoretical consideration is the ecological model of bystander intervention (Banyard, 2011), which seeks to expand upon Latane and Darley's model by considering community-level variables. This model emphasizes the importance of macrolevel factors in promoting change among individuals, highlighting the importance of interventions that are easily widely disseminated for the promotion of increased engagement in bystander intervention against dating violence on college campuses.

Bystander Interventions to Reduce Dating Violence on College Campuses

Bystander intervention for dating violence evolved from the development of bystander intervention tools for sexual violence. The bystander approach was first applied to the prevention of campus violence in the mid-1990s (Katz, 1994). Researchers pointed to community norms as playing a significant role in the perpetuation of violence, especially on college campuses (DeKeseredy et al., 2018). A large-scale shift in cultural and social norms was needed, requiring actions (e.g., bystander interventions) from the campus community (Banyard, 2003).

Bystander intervention educational programs are relatively new in the field of dating violence prevention, but their outcomes are encouraging. However, these programs are few in number and inconsistent in terms of their potential reach and cost-efficiency (Shorey et al., 2012). Most of the programs designed for college campuses are in-person interventions focused on preventing sexual assault rather than dating violence. Researchers tested the efficacy of bystander intervention programs and noted significant limitations. For example, *Project PEACE*, which is an in-person intervention for college students, had mixed findings (Jaffe et al., 2017). A study examining the *Men's Project*, an educational program for college men, found that when men had a support group, they were able to use bystander strategies while challenging their sexist environment (Barone et al., 2007). However, this program was limited by its focus on male students. A program by Moynihan and Banyard (2008) that targeted campus Greeks

and athletes, the populations with the highest rates of sexual violence on college campuses, successfully improved scores from pretest to posttest on six relevant outcome variables. Also, a program called *Bringing in the Bystander* increased the likelihood of helping, confidence in bystander behaviors, and taking responsibility for ending college dating violence among sorority women (Moynihan et al., 2011). These programs were limited by high costs, small sample sizes, and circumscribed target populations, suggesting the need for the development of effective online interventions.

Online interventions are beneficial for college students because they are accessible to (and convenient for) large numbers of students at low cost (O'Brien et al., 2021). In addition, online interventions have been shown to be effective in educating college students on a variety of topics (e.g., sexual assault; Devine, 2018, substance use; Barry et al., 2016, responding to bereaved peers; Hill & O'Brien, 2021). Online bystander training programs focused on reducing dating violence also show considerable promise (Hines & Palm Reed, 2017). An intervention called *Friends Helping Friends* increased participants' perceived responsibility to help, skills to act as a bystander, and intention to help when compared to a control group (Amar et al., 2015). However, this study was limited in its generalizability because it was only tested with female students and non-random group assignments.

A promising online intervention that was effective in educating college students about dating violence and appropriate bystander behaviors was the *STOP Dating Violence* program (O'Brien et al., 2021). Originally, the 3-component intervention was in the format of a Prezi slideshow, which is now a less recent medium for disseminating information to college students. The first component, "Education about Warning Signs of Dating Violence," taught college students to recognize the warning signs of dating violence, including psychological and physical abuse (O'Brien et al., 2021). It was consistent with the first two steps in Latane and Darley's (1970) Model of Bystander Behavior, which indicates that becoming aware of a problematic situation and perceiving the situation as an emergency are the first steps to intervention. The use of risk recognition as a tool in interventions against sexual assault and domestic violence was well-established, but rarely applied to programs focused on dating violence (O'Brien et al., 2021). Survivors of dating violence were not as likely to

recognize danger in domestic violence vignettes as participants who had not experienced such violence (Witte & Kendra, 2010). The inability of those who experience dating violence to recognize risk supports the need for increased bystander intervention training efforts.

The second component, “Education Intended to Eradicate Psychological Barriers to Helping,” educated bystanders about impediments to action according to Latane and Darley’s (1970) model: diffusion of responsibility, evaluation apprehension, and pluralistic ignorance. The third and final component, “Education Regarding Desired Bystander Behaviors,” provided bystanders with a series of actions that they can use to assist those who experience dating violence. This component addressed recommendations to emphasize the role of bystanders in reducing dating violence (Shorey et al., 2012). Research on dating violence and sexual assault prevention identified bystander education that teaches students to proactively interfere when they witness potentially harmful or controlling behaviors as key to prevention of abusive behaviors (Banyard, 2011).

Current Study and Hypothesis

The purposes of this study were to revise the *STOP Dating Violence* bystander intervention program (O’Brien et al., 2021) and conduct a randomized controlled trial to test the effectiveness of this revised intervention. After the intervention was updated and converted from a Prezi to a video format, this study assessed the effectiveness of the updated intervention by evaluating the degree to which individuals exposed to the intervention learned desired bystander behaviors when compared to those who did not receive the video intervention. One group of participants that did not view the video intervention looked at a website containing information about intimate partner violence to simulate self-directed information-seeking, while another group completed an unrelated filler task. We hypothesized that participants exposed to the video intervention would have more knowledge about bystander interventions when compared to students who viewed related information on a website and individuals in a no-intervention control group.

Method

Participants

An *a priori* statistical analysis was calculated using the G*POWER v3 software (Faul et al., 2007) to determine the number of participants needed to

achieve statistical power of 0.95, a medium effect size ($f = 0.25$), with an overall $\alpha = 0.05$ for a regression. All assumptions for an ordinary least squares regression were met. The results suggested that a total sample size of 204 participants was needed.

Initially, 456 undergraduate students accessed the online survey via Qualtrics; 449 students met inclusion criteria (e.g., proficiency in English, between 18 and 24 years old, and enrolled at our large mid-eastern university), and provided informed consent. Participants who did not complete at least 85% of the items were removed from the sample (42 individuals, $n = 407$). Then, the 72 participants who failed to provide the correct responses to two validity check items (i.e., “Please select ‘strongly disagree’ for this item” and “Please select ‘strongly agree’ for this item”) were not included in the sample, resulting in a total of 335 valid responses. There were 122 participants in the control condition, 120 in the intervention condition, and 93 in the website condition (see Figure 1). There were fewer valid responses in the website group as a number of participants in that condition failed to complete at least 85% of the items, perhaps due to the length of the time (10 minutes) that they were asked to review the website.

The average age of the participants was 19.43 (SD = 1.13), and the majority identified as women (73.1%) and straight (89.9%). Most were single (63%), and had not experienced dating abuse (77%) or violence in their families of origin (83.3%). Students were enrolled in a wide range of college majors with the top three being Psychology (35.8%), Information Sciences (15.5%), and Biology-related (10.7%). Additional demographic information can be found in Table 1.

Procedure

After receiving approval from the University Institutional Review Board, participants were recruited through the Department of Psychology subject pool (consisting of students from across the university who were enrolled in an introductory psychology course), flyers, and social media, where they received a link to a Qualtrics survey. Students who accessed the survey, met the inclusion criteria, and provided consent were invited to complete a demographic questionnaire and then a pretest survey assessing their knowledge about appropriate bystander interventions. Participants then were randomly assigned to one of three conditions. The intervention group watched the 7-minute *STOP Dating Violence* video intervention. The web

site group scrolled through loveisrespect.org, a website containing information about dating violence including warning signs of abuse in an intimate relationship and steps for supporting friends and peers who may be experiencing intimate partner violence for 10 minutes. The control group was asked to complete filler tasks (i.e., write an essay about your favorite college course). Participants in the intervention group were unable to move past the page containing the video until seven minutes had elapsed, and those in the website group were unable to move past the website page until 10 minutes had elapsed. Then, participants in every condition completed a posttest survey made up of the same items as the pretest survey. All participants were provided with information about two domestic violence hotlines and their campus counseling center upon completion of the study. The procedural pathways for participants in each condition are provided in Figure 2. Students received one research credit toward a psychology course requirement for completing the survey.

STOP Dating Violence Intervention

The *STOP Dating Violence* intervention was created to educate college students about recognizing dating violence and intervening in situations of dating violence (O'Brien et al., 2021). As described previously, the intervention has three components, the first and third of which were adapted to create the *STOP Dating Violence* animated video intervention. The modifications made to the *STOP Dating Violence* intervention can be conceptualized through the FRAME model, which systematizes the modifications by considering who is involved in the process, what is modified, the level of delivery and context in which modifications are made, and the nature of the content modification (Stirman et al., 2013). The modifications were made by a team of two researchers, one of whom led the development of the original *STOP Dating Violence* intervention. The content and context of the intervention was modified through the conversion from Prezi to animated video, simplifying and modernizing the format for participants engaging with the intervention.

The second component was not included in the video to shorten the length of the intervention and to focus on the effectiveness of education about warning signs of dating violence and bystander behaviors. For this study, the presentation first was modified to shorten the content to maximize participant engagement. Specifically, multiple-choice questions were removed from

the first component and presented as open-ended questions that were answered by the narrator. For example, the narrator posed the following: *"Now that we have described dating violence, we want you to imagine your best friend has been dating someone for three months. What are some "red flags" or warning signs of dating violence that you might notice?"* After a brief pause, several common red flags were described by the narrator.

Consistent with the original intervention, information was delivered in a brief lecture format and then applied to vignettes in which dating violence occurred in typical college settings (e.g., in a residence hall, in a shared apartment, and at the campus gym) so that students saw how the bystander behaviors could be used in real-life situations. The vignettes were created by a team of researchers (comprised of professors and graduate students in psychology, several of whom had experience working in shelters for abused women and their children) and were informed by the dating violence literature to depict different dimensions of dating violence occurring among a diverse sample of people (O'Brien et al., 2021). The team conducted a thorough literature review about dating violence, bystander interventions, and the best practices for online interventions before writing and editing the scripts. Important information was repeated, and time was provided for participants to think and respond to narrator questions about the *STOP* steps. *For example, in the video intervention, the narrator says the following:*

"OK, over the last month you noticed that one of your close friends has stopped coming to pick-up basketball games on Friday nights. When you see him at the gym, you ask why he hasn't been around. He says that he's really busy – and that his girlfriend wants him to spend all of his time with her. He tells you that he tried to break up with her but she threatened to kill herself. He feels stuck but he would feel really guilty if something bad happened to her. How might you respond to this situation?"

At this point, there is a pause in the video. Then, the narrator applies each step of the STOP model to this vignette.

For this study, a video was created using online animation software (Vyond), the modified script and voiceover recording. The characters shown in the vignettes were of diverse ethnic backgrounds and represented a range of sexualities and dating preferences. The video intervention can be found at go.umd.edu/DatingViolence

Warning Signs and go.umd.edu/DatingViolenceHowToHelp).

Measures

Knowledge regarding appropriate interventions

Eight items from the Knowledge of Appropriate Bystander Interventions scale (O'Brien et al., 2021) were used to measure knowledge regarding appropriate bystander behaviors outlined in the *STOP Dating Violence* intervention. Responses were provided on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*), e.g., "It's important to help in a dating violence situation even if it means that I might be in danger." Items 1, 2, 3 and 6, which were incorrect statements about appropriate bystander interventions, were reverse scored and the responses were summed to create an index of knowledge about recommended bystander intervention practices from the *STOP Dating Violence* intervention. High scores indicated greater knowledge about general bystander behaviors and those emphasized in the *STOP* intervention. In prior research, the reliability of the 8-item measure was not calculated because the items assessed different dimensions of knowledge and were not expected to correlate. Support for validity was found in a prior study as students who completed the *STOP Dating Violence* intervention scored the highest on this measure (O'Brien et al., 2021).

Demographics

Participants also responded to items assessing gender, age, sexual orientation, major, relationship status, the length of their relationship, and whether they experienced violence in their families or relationship abuse.

Analyses

Responses that did not meet the inclusion criteria ($n = 6$), did not pass the validity checks ($n = 72$), and did not complete at least 85% of the items ($n = 42$) were removed before data analysis. The means, standard deviations, and ranges for the pre and posttest scores on the Knowledge of Appropriate Bystander Interventions scale were calculated and are provided in Table 2. An ordinary least squares regression was used to test the hypothesis by examining differences in scores on the measure of knowledge about appropriate bystander interventions at posttest across conditions. The main explanatory variable was the experimental condition, with pretest score as a linear control. The model included the interaction of condition with pretest score; posttest score was the dependent variable. An alpha level of .05 was used to test for significance.

Significant differences were found among conditions for scores on the measure assessing knowledge of appropriate bystander interventions ($R^2 = .522$, $F(5, 332) = 71.904$, $p < .01$, partial $\eta^2 = .319$). Bonferroni-adjusted pairwise comparisons indicated that the intervention condition had a higher mean than those in the website group (by 1.92 points, 95% CI [1.00, 2.83]) and the control group (by 4.82 points, 95% CI [3.97, 5.67]), and that the website group had a higher mean compared to the control group (by 2.90 points, 95% CI [1.99, 3.81]). All comparisons were significant at $p < .001$. To summarize, students in the intervention condition had the most knowledge regarding appropriate bystander interventions at posttest.

Discussion

Findings from this study suggested that the updated *STOP Dating Violence* video intervention was effective in educating undergraduate students about appropriate bystander interventions. Participants who viewed the *STOP Dating Violence* video intervention had the greatest knowledge of appropriate bystander interventions at posttest when compared to participants who were in the control and website conditions. This finding is important because it indicates that the video intervention effectively aids college students in learning about desired bystander behaviors in dating violence situations. Moreover, this finding represents an important first step in the future process of changing campus cultures. If students can be educated about warning signs of dating violence and how to intervene when it occurs, the potential exists for them to disseminate this knowledge and these behaviors through social networks, thus contributing to community-wide changes in social norms (Coker et al., 2014).

Additionally, a large portion of data collection took place during campus closures due to COVID-19. The success of the intervention during this time demonstrated that educational videos may be valuable tools for sharing information regardless of student and campus location. Should these findings be replicated, the *STOP Dating Violence* video intervention may serve as a low-cost and effective educational tool to reduce rates of dating violence on college campuses.

Limitations

There are several important limitations of this study. First, the sample was predominantly comprised of straight women, perhaps because a significant por

tion of participants were recruited through the Department of Psychology study pool which contains more women than men. It is important to ensure that the intervention works well for all genders and sexualities. While the intervention utilized inclusive language and provided examples of many different kinds of relationships, it is necessary to assess its effectiveness for a broader population to ensure that the results are generalizable.

Additionally, no constructs were assessed besides knowledge of appropriate bystander interventions. Constructs like intention to intervene or self-efficacy may be important in gauging the effectiveness of the intervention, as knowledge alone may not be enough of a catalyst for bystander action. Other facets of participant perspectives could play valuable roles in determining the effectiveness of the measure including general knowledge of dating violence, core beliefs about gender and sexuality, susceptibility to social desirability, and life experience.

It also is important to note that participants in the intervention group were asked to think about how to apply what they learned about appropriate bystander behaviors to vignettes presented in the intervention video, while participants in the website group were not asked to reflect on what they learned. It is possible that inviting the participants to apply the *STOP* model to hypothetical situations contributed to the retention of the information. Thus, some variability in knowledge scores across groups could have occurred because of the lack of opportunities to apply the *STOP* model in the website condition.

Another limitation of this study was that participant knowledge was assessed about bystander interventions in generalized dating violence situations rather than in specific circumstances. The vignettes provided in the video were specific and nuanced, and it would be valuable to assess how participants would apply their knowledge to different forms of dating violence and the complexities associated with specific situations (e.g., monitoring a partner who had cheated on them previously). Similarly, we did not include a measure of participant engagement; future research should assess the degree to which participants were engaged in the shortened video version when compared to the longer Prezi presentation.

Finally, increased knowledge about dating violence and desired bystander interventions may not result in actual bystander behaviors in real-life settings.

Numerous factors including social pressure, substance use, or other variables may impact motivation to intervene in dating violence situations. Relatedly, psychological processes that impede engagement in bystander behaviors were not explicitly addressed by the intervention. Inclusion of these factors could encourage college students to challenge thoughts that limit involvement and engage more fully in bystander actions.

Future Research Directions

Research is needed to further evaluate whether the *STOP Dating Violence* video intervention is more effective than the original Prezi presentation. Additionally, it is important to assess whether knowledge gained from bystander training interventions, including the *STOP Dating Violence* video intervention, translates into actual bystander behaviors in real-life dating violence situations. Conducting this research is challenging because it requires students to have witnessed dating violence. In addition, students may not be aware that what they have witnessed or heard about was dating violence, or they may be unable to remember exactly what occurred. A promising mechanism for evaluating bystander behaviors in real-life dating violence situations is the use of diary collection methods which involve repeated participant self-reports for a specified amount of time. Such methodology would enable participants to immediately log their experiences of any encountered dating violence onto their phones or computers, allowing for more accurate recall of the event and their reactions to incidents of dating violence.

A similarly challenging but important future direction is to examine the barriers and facilitators associated with bystander behaviors in real dating violence situations. Many factors ranging from social norms to core values could play a role in making it easier or more challenging to intervene. Information about salient barriers and facilitators could be collected in conjunction with self-reports about bystander behaviors in real-life dating violence situations. After participants report having seen dating violence and the actions that they took, they could then respond to measures asking them about what factors facilitated and hindered intervention. These factors must be studied so that researchers can develop educational programming focused on the most important factors that impact the decisions of college student bystanders.

Another important future direction is to see whether participation in this intervention affects

COLLEGE DATING VIOLENCE

students' ability to recognize dating violence in their relationships and to leave an abusive relationship. An ideal and most effective intervention would allow students to recognize dating violence in their lives as well as in the lives of their peers.

Finally, it is important that future interventions address how the nuances of specific situations may change bystander perceptions of dating violence and plans to intervene or engage in helpful bystander behaviors. Real-life situations of dating violence are likely to be complex and confusing for bystanders who are considering taking action. To counteract blaming those who experienced dating violence and lacked bystander confidence as a result of contextual nuance, interventions should emphasize that the behaviors described as dating violence call for responsible bystander action under all circumstances.

Conclusion

To conclude, dating violence is a common and harmful occurrence on college campuses. College students are often unsure how to provide assistance to peers experiencing dating violence. The *STOP Dating Violence* video intervention may serve as a cost-effective, engaging, and informative educational tool that teaches students how to recognize and respond to dating violence. It is our hope that this research will contribute to efforts to increase bystander behaviors, ultimately resulting in reduced incidents of dating violence on college campuses.

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COLLEGE DATING VIOLENCE

Table 1

Demographics (n = 335)

Variable	Total %	(n)
Age (years)		
18	20%	67
19	37%	124
20	25.7%	86
21	11%	37
22	.02%	7
23	.01%	5
24	.003%	1
Gender		
Female	73.1%	245
Male	26.6%	89
Non-binary	.3%	1
Sexual Orientation		
Straight	89.9%	301
Lesbian/Gay	1.5%	5
Bisexual/Pansexual	8.1%	27
Other	.6%	2
Relationship Status		
Single	63%	211
In a dating relationship	34.9%	117
Married	.3%	1
Unsure	1.8%	6

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Experienced Violence in their Families (Y/N)		
Yes	11.9%	40
No	83.3%	279
Unsure	4.8%	16
Experienced Relationship Abuse (Y/N)		
Yes	15.8%	53
No	77%	258
Unsure	7.2%	24
Major		
Information Sciences	13.4%	45
Biology-related	10.1%	34
Communications	1.2%	4
Public health-related	6.2%	21
Nursing	1.2%	4
Psychology	23.3%	78
Multiple Majors	14.6%	49
Kinesiology	4.2%	14
Computer Science	2.1%	7
Criminal Justice and Criminology	1.5%	5
Journalism	1.5%	5
English	0.1%	3
Business	3%	10
Education-related	1.5%	5
Economics	1.5%	5
Family Science	.1%	3
Undecided	6%	20
Other	6.6%	22

COLLEGE DATING VIOLENCE

Table 2

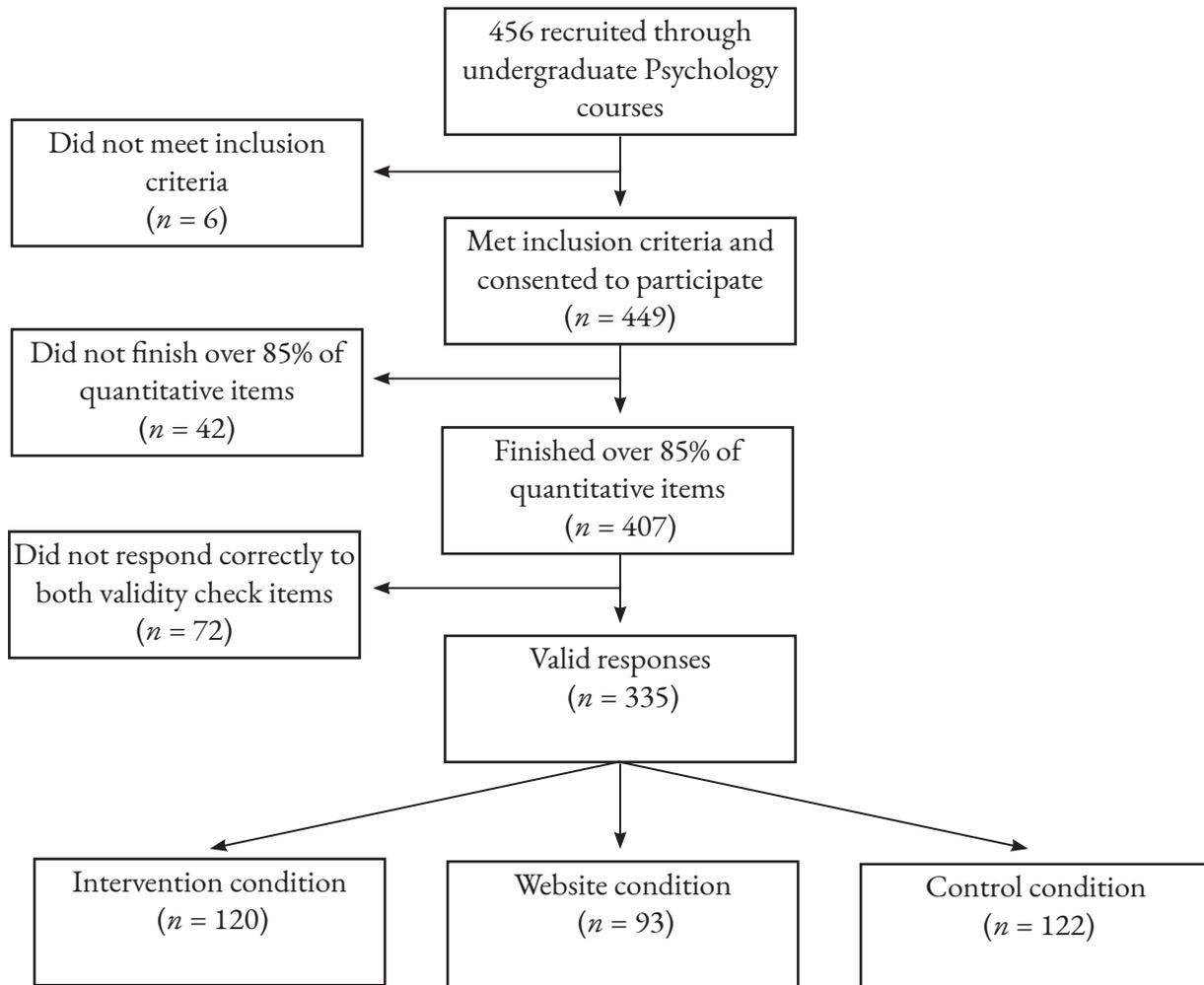
Means, Standard Deviations, Ranges, and Correlations Among the Measures

Measures	1	2
1. Knowledge, pre	1	
2. Knowledge, post	.47*	1
Mean	31.57	34.42
Standard Deviation	3.36	4.51
Actual Range	22-42	23-48
Possible Range	17-68	17-68

Note. *Correlation is significant at the .01 level.

Figure 1

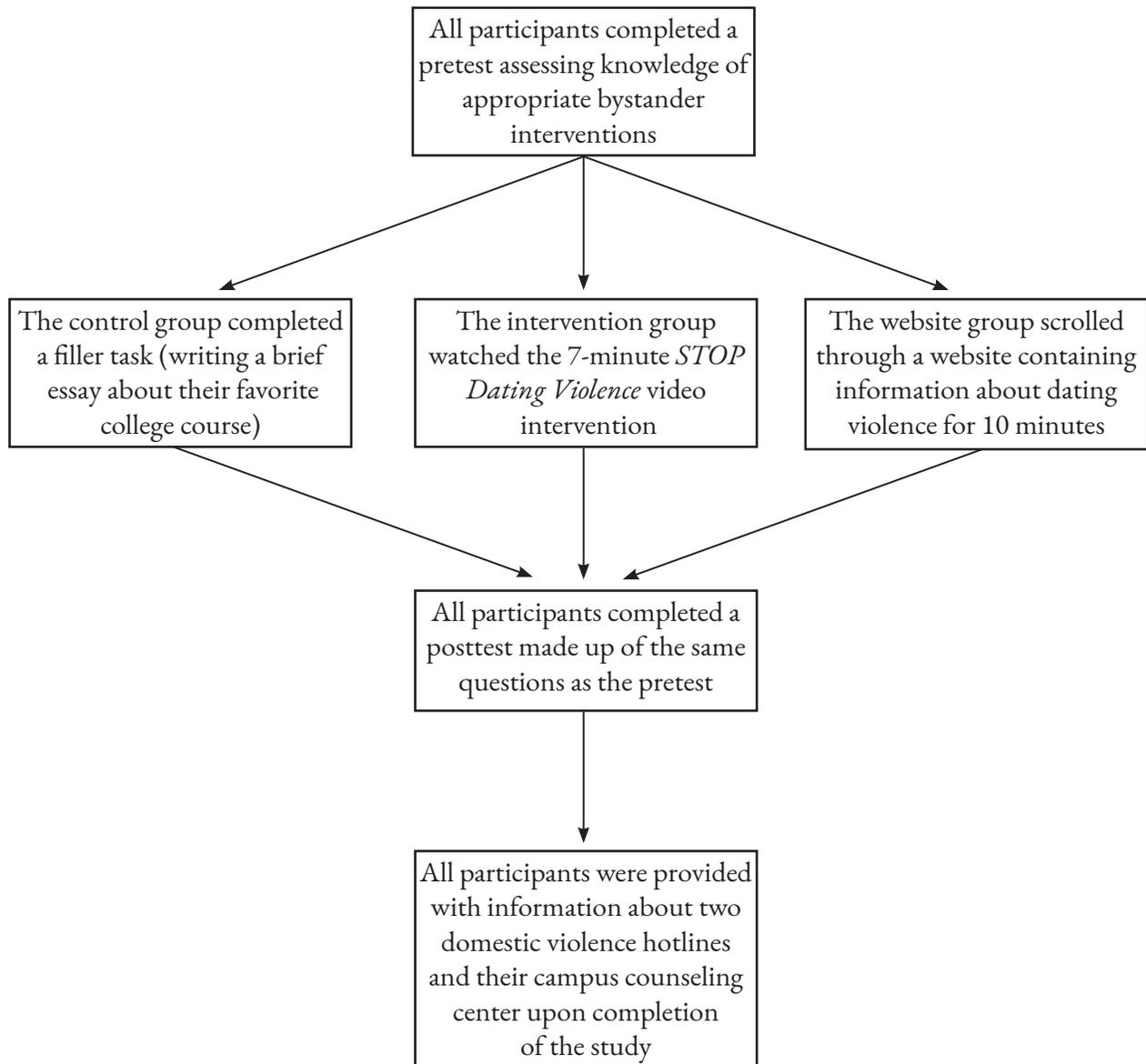
Participant Assignment to Conditions



COLLEGE DATING VIOLENCE

Figure 2

Procedural Pathways



The Effects of Face Masks on Emotion Interpretation in Socially Anxious Individuals

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Previous research has found emotion interpretation biases in individuals with social anxiety (SA) when emotions are ambiguous. Additionally, research has shown that face masks impair emotion recognition. The present within-subjects, quasi-experimental study examined the impact of face masks on emotion identification in individuals with SA. After pre-screening using a brief SA scale (the SIAS-6, a shortened version of the Social Interaction Anxiety Scale), 92 undergraduate students with qualifying SA scores completed an emotion identification task. The task included images of masked and unmasked individuals expressing four emotions. Results indicated impaired accuracy for all types of masked trials. When examining incorrect choice selections, it was found that neutral masked faces were misinterpreted as sad or fearful significantly more than their unmasked counterparts, suggesting a mask-specific interpretation bias. In relation to previous research on SA and hypervigilance for threat faces, when considering all masked trials, accuracy was highest for masked angry trials. While this study was limited in that it did not include a non-anxious group, the results have interesting implications. Importantly, the present findings suggest that some previously identified SA-related emotion interpretation characteristics persist when viewing masked faces (e.g., hypervigilance for threats), while others do not (e.g., default bias for interpreting neutral as hostile). Future research should focus on elucidating the causes of the present results, which are important to this population and clinicians, as socially anxious individuals attribute greater social cost to negative emotions; thus, misinterpretation of emotions as negative may be detrimental to their mental health.

Keywords: social anxiety, face masks, emotion recognition, face perception, emotions

The COVID-19 pandemic (henceforth referred to as the pandemic), prompted widespread use of face masks in public settings. With this necessary protective measure, there were unintended social and mental health consequences. Masks impair emotion recognition (Carbon, 2020; Gori et al., 2021; Grundmann et al., 2021), and negatively impact perceptions of others, including perceived closeness (Grundmann et al., 2021), empathy (Wong et al., 2013), and friendliness (Wiesmann et al., 2021). Importantly, social anxiety (SA) affects the interpretation of emotions, including hypervigilance for threat faces (Klumpp & Amir, 2009; Mogg et al., 2004) and biases in emotion interpretation (Button et al., 2013; Gutiérrez-García & Calvo, 2017; Schofield et al., 2007; Yoon & Zinbarg, 2008). Considering these impacts, socially anxious individuals (SA individuals) may demonstrate unique patterns of emotion inference when viewing masked faces.

Social Anxiety and Emotion Interpretation

More specifically, regarding emotion interpretation biases, Gutiérrez-García and Calvo (2017) studied interpretations of ambiguous emotional faces and found that when compared to non-anxious controls, SA individuals were more likely to correctly detect low intensity displays of disgust and anger, more likely to incorrectly identify neutral faces as angry, and less likely to interpret neutral faces as happy or sad. These findings may reflect a greater ability or motivation of SA individuals to identify social threat

emotions, possibly due to their hypervigilance for threat faces. Further, using an incidental learning task, Yoon and Zinbarg (2008) found that SA individuals demonstrate a default bias toward interpreting neutral faces as threatening. This bias may impact the mental health of SA individuals, as they also attribute excessive social cost to interacting with others displaying negative emotions of various intensities (i.e., they report that it would be excessively bad for them to interact with individuals displaying negative emotions, as compared to control participants' reports; Button et al., 2013; Schofield et al., 2007).

Impacts of Face Masks

Moreover, researchers have found evidence that emotion identification accuracy is impaired when masks are worn. Several experimental studies have examined this topic by having participants view photos of individuals and identify the facial expressions displayed, with and without the presence of masks in the photos (Carbon, 2020; Gori et al., 2021; Grundmann et al., 2021). All three of these recent studies found evidence that masks presented a challenge to emotion identification, as accuracy was lower for masked faces. This effect exists regardless of participant age, as it has been shown in children as young as age three (Gori et al., 2021) and in young, middle-aged, and older adults (Carbon, 2020; Gori et al., 2021; Grundmann et al., 2021).

Aside from impacting emotion identification, masks also have effects on social judgments and percep-

EFFECTS OF FACE MASKS IN SOCIALLY ANXIOUS INDIVIDUALS

tions of others. In their experiment examining masks and emotion identification, Grundmann et al. (2021) also examined participants' social judgments of the image models. They found that participants' ratings of perceived closeness to the individual pictured were lower when the individual was wearing a mask. Further, Wiesmann et al. (2021) investigated an intervention to mitigate the negative effects of masks on the doctor-patient relationship. Their intervention, which consisted of smiling portrait photos placed on the chests of hospital staff members, was associated with significantly higher ratings of staff friendliness compared to when the staff wore masks alone. This suggests that patients perceive staff members as less friendly when masks are worn. Similar effects were found prior to the pandemic; in a randomized-controlled trial, Wong et al. (2013) examined the effect of medical face masks worn by physicians on the doctor-patient relationship. They found that patients perceived their doctors as significantly less empathetic when the doctors were masked versus not. Taken together, the results of these three studies indicate that masks negatively impact perceptions of others, including perceived closeness (Grundmann et al., 2021), empathy (Wong et al., 2013), and friendliness (Wiesmann et al., 2021). Considering the effects of SA on emotion interpretation, these impacts on perceptions of others may be exacerbated by the interpretation biases already present in SA.

Implications for the Present Study

While it is known that masks impair emotion recognition (Carbon, 2020; Gori et al., 2021; Grundmann et al., 2021) and induce more negative perceptions of others (Grundmann et al., 2021; Wiesmann et al., 2021; Wong et al., 2013), researchers have not yet identified specific populations which may be affected to a higher degree. As such, SA individuals may be at a higher risk of misinterpreting facial expressions when masks must be worn. Specifically, SA individuals interpret ambiguous faces as hostile (Gutiérrez-García & Calvo, 2017; Yoon & Zinbarg, 2008) - this may also be true when masks are worn, as they make expressions more uncertain. Those with SA attribute excessive social cost to interacting with individuals displaying negative emotions (Button et al., 2013; Schofield et al., 2007), and thus, misinterpretation of emotions may be detrimental to their mental health. This would be important for mental health professionals to be aware of when treating individuals with SA during the pandemic.

Based on evidence from prior research, the purpose of the present study was to examine emotion interpretation in individuals with SA when viewing masked and unmasked faces. A 2 (masking) X 4 (expression) within-subjects, quasi-experimental design was used to assess the following hypotheses:

H1: SA individuals will demonstrate lower accuracy for masked faces, with the lowest accuracy for neutral masked faces.

H2: Neutral faces will be most commonly confused with anger, with this being more likely to occur when faces are masked.

H3: SA scores will be negatively correlated with overall accuracy, and with accuracy for masked trials, while being positively correlated with the percentage of neutral faces confused as angry.

Method

Participants

Participants were 92 undergraduate psychology students at a large mid-Atlantic university with qualifying self-reported SA scores. All received course credit for participating. SA is especially prevalent in young adults and has increased during the pandemic (Hawes et al., 2021), making this a relevant population. Five participants were excluded, three for being outliers and two for other reasons (incomplete data and prior knowledge of the study), leaving 87 participants in analyses. A priori power analysis was used initially to inform the number of participants needed for a 2 x 4 within-subjects ANOVA, and post hoc power analysis indicated an achieved power of 88.08% with 87 participants for an effect size of $\eta^2_p = 0.05$ (MorePower version 6.0.4; Campbell & Thompson, 2012).

A brief SA scale (SIAS-6; Peters et al., 2012) was used to pre-screen participants for social anxiety. Inclusion criteria consisted of a SIAS-6 score of at least 7 and a minimum age of 18 years old. The sample was diverse in race (42.5% White, 29.9% Black, 10.3% Hispanic/Latinx, 8.0% multiracial, 6.9% Asian, 2.3% other) and similar in age ($M = 19.49$, $SD = 1.79$). The majority of the sample identified as female (72.4%). This reflects the higher prevalence of SAD in females compared to males in the United States (National Institute of Mental Health, 2017), although other factors, such as major, likely contributed to this gender ratio as well. 4.5% identified as nonbinary or another gender identity.

Measures & Materials

Social Interaction Anxiety Scale

Mattick and Clarke's (1998) Social Interaction Anxiety Scale (SIAS) is a 19-item self-report measure of an individual's social interaction fear. A 6-item version (SIAS-6) was developed by Peters et al. (2012). The items are statements intended to measure anxiety levels when initiating and maintaining social interactions; for example, "I have difficulty making eye contact with others." Participants rate the degree to which each statement is characteristic of themselves on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely). The SIAS includes two reverse scored items. Total scores are calculated, with optimum cut-off scores being 39.5 for identifying SAD using the SIAS (Carleton et al., 2009) and 7 when using the SIAS-6 (Peters et al., 2012). The SIAS is both reliable and valid (Mattick & Clarke, 1998), and the SIAS-6 is comparable to the original scale (Peters et al., 2012).

Emotion Identification Task

For the emotion identification task, all participants viewed the same set of 96 images, which systematically differed in expressed emotion (happy, angry, fearful, neutral), mask-wearing (mask, no mask), and sex (male, female). Stimuli appeared individually in a Qualtrics survey (Qualtrics, Provo, UT), with the masked image block first (Gori et al., 2021) to avoid participant demand characteristics. Stimuli order was randomized within blocks. Because race can impact emotion identification (Kang & Lau, 2013; Tuminello & Davidson, 2011) through stereotyping and social categorization, only Caucasian faces were shown, as in previous work (e.g., Schofield et al., 2017). To mitigate these potential confounding effects, race was kept consistent throughout.

The images were randomly selected from the Chicago Face Database (CFD; version 3.0; Ma et al., 2015), with each model appearing only once to avoid habituation. The CFD provides two types of happy images, however, only open-mouth happy images were used. CFD images are standardized in many ways, including characteristics of the models, environment, and photography (Ma et al., 2015). Models had multiple photos taken for each expression and independent raters identified the best photo of each. Neutral images were highly reliable based on norming data collected from a large and racially diverse sample; however, such data was not obtained for emotional images.

For the present study, Adobe Photoshop was used to digitally edit a randomly selected subset of images, adding a mask (906 x 644 pixels) that was tailored to the face of each individual, and adding faint shadows for realism. Masks were centered horizontally and placed vertically to cover the nasolabial-alar crease. An example of a CFD image before and after editing can be seen in Figure 1, and the CFD codes for all images used are available online at the link provided in the data availability statement. In the task, six multiple-choice options (happy, content, neutral, angry, fearful, and sad) were provided in a consistent order. Content and sad served as positive and negative distractor options to avoid ceiling effects and were intended to be somewhat distinguishable from the emotions shown. Two measures were obtained: accuracy and neutral trial incorrect choice selections (the percentage of responses for each incorrect option when the correct answer was neutral; this was used to determine if any interpretation biases were present).

Demographic Information

Within the Qualtrics survey were several demographic questions regarding age, gender, and race. All were open-ended questions, allowing participants to respond freely. Responses to the gender and race questions were later categorized. Categories were created based on the most common responses given. Gender categories were female, male, non-binary, and other, while race categories were White, Black, Hispanic/Latinx, multiracial, Asian, and other.

Procedure

After receiving IRB approval, SIAS-6 pre-screening occurred online. The researcher was blind to pre-screening scores during data collection. Each participant came to a university laboratory, provided written informed consent, and completed the Qualtrics survey on a university desktop computer. This included several open-ended demographic questions, the emotion identification task, and the SIAS. The researcher debriefed them, answered any questions, and provided mental health resources. Pre-screening and study data were combined, downloaded to Microsoft Excel, and analyzed using IBM SPSS Statistics 27. University COVID-19 precautions were complied with in the laboratory.

Results

In the present study, masking and expression of

EFFECTS OF FACE MASKS IN SOCIALLY ANXIOUS INDIVIDUALS

the image models were manipulated, and subsequently, SIAS total scores, emotion identification accuracy, and neutral trial incorrect choice selections were measured. Accuracy outcomes were checked for skewness and outliers before analysis. Three outliers were identified, having unusually low scores attributed to lack of attention. Unusually high scores were considered true data. While participants answered correctly in about three-quarters of all trials, accuracy for masked ($M = 64.39\%$, $SD = 8.30\%$) and unmasked ($M = 86.71\%$, $SD = 6.00\%$) trials notably differed. As for SA scores, the average SIAS score ($M = 38.94$, $SD = 12.83$) approached the cut-off score of 39.5, while the average SIAS-6 score ($M = 11.31$, $SD = 3.95$) exceeded the cut-off score of 7.

Prior to conducting the planned repeated measures ANOVAs, test assumptions were checked. Approximate normality was violated, as the dependent variables for each test were extremely skewed in some conditions. Transformations were attempted; however, some conditions became overcorrected. Thus, the aligned rank transform procedure (Salter & Fawcett, 1993), a nonparametric option which aligns and ranks data for each effect before conducting factorial ANOVAs, was utilized through the program ARTool (Elkin et al., 2021; Wobbrock et al., 2011). For each main effect and interaction effect, a separate ANOVA was conducted using the data aligned and ranked for that effect; only the effect for which the data was aligned was considered from each (Wobbrock et al., 2011). For instance, to examine the main effect of masking, the data was aligned and ranked for said effect using ARTool. Then, the appropriate ANOVA was conducted using this data, however, only the main effect of masking could be considered from these results. This process was repeated for each main effect and interaction. Mauchly's test was used to check the assumption of sphericity and Greenhouse-Geisser corrected values were reported if violated. For each simple effects analysis, an additional ANOVA was conducted using the data aligned and ranked for contrasts (Elkin et al., 2021).

Accuracy

To test H1, a 2 (masking: mask, no mask) x 4 (expression: happy, neutral, angry, fearful) repeated measures ANOVA was performed on accuracy (Figure 2). Significant main effects of masking, $F(1, 86) = 644.70$, $p < .001$, $\eta^2p = .88$, and expression, $F(2.52, 216.57) = 35.59$, $p < .001$, $\eta^2p = .29$, $\epsilon = .84$, were found. These effects were qualified by a significant interaction, $F(3,$

258) = 90.56, $p < .001$, $\eta^2p = .51$. A simple effects analysis revealed that masks significantly impaired accuracy for happy, $F(1, 86) = 741.70$, $p < .001$, angry, $F(1, 86) = 138.74$, $p < .001$, and fearful trials, $F(1, 86) = 495.51$, $p < .001$, but not neutral trials. Frequent confusion with one distractor option may have caused the lack of an effect on accuracy for neutral trials. Here, the first part of H1, which stated that accuracy would be lower for masked faces, was supported, however, the second part of H1, which predicted that accuracy would be lowest for neutral masked trials, was not supported. Interestingly, when comparing accuracy among all masked trials, accuracy was highest for masked angry trials ($M = 79.50$, $SD = 13.13$), suggesting that hypervigilance was present for ambiguous threat faces.

Neutral Trial Incorrect Choice Selections

To test H2, a 2 (masking: mask, no mask) X 5 (expression choice: happy, content, angry, fearful, sad) repeated measures ANOVA was performed on the percentages of incorrect responses for each option (Figure 3). Notably, seven participants were accurate for all neutral masked trials, unmasked trials, or both, meaning that $n = 80$, as participants with missing data were excluded here. Significant main effects of masking, $F(1, 79) = 69.75$, $p < .001$, $\eta^2p = .47$, and expression choice, $F(2.43, 192.24) = 145.94$, $p < .001$, $\eta^2p = .65$, $\epsilon = .61$ were found. These effects were qualified by a significant interaction effect, $F(1.91, 151.07) = 27.06$, $p < .001$, $\eta^2p = .26$, $\epsilon = .48$. A simple effects analysis revealed a significant effect of masking on selecting content, $F(1, 79) = 15.96$, $p < .001$, fearful, $F(1, 79) = 17.42$, $p < .001$, or sad, $F(1, 79) = 18.86$, $p < .001$, rather than neutral. Specifically, when incorrect, participants tended to choose content instead of neutral for unmasked trials, while they tended to choose fearful and/or sad instead of neutral for masked trials. There was no effect of masking on selecting happy or angry rather than neutral. Contrary to H2, there was a nonsignificant trend toward selecting angry for neutral unmasked faces.

Relationships Among Variables

Lastly, to test H3, Spearman's correlations among SA scores, accuracy outcomes, and neutral trial incorrect choice selections were calculated. "SA scores" refers to both SIAS and SIAS-6 scores. "Accuracy outcomes" refers to accuracy for each masking condition. No correlations were significant among SA scores and accuracy outcomes or among SA scores and neutral trial incorrect choice selections. As such,

H3 was not supported. SIAS and SIAS-6 scores had a moderate positive correlation, $r = .47$, $p < .001$.

Discussion

This study aimed to determine whether SA individuals demonstrate emotion interpretation biases when viewing masked faces, as previous research had not examined the effects of masks in populations that may be differentially affected by the associated emotion recognition challenges. The present study's SA participants demonstrated impaired accuracy for identifying the emotions of masked individuals, while having high accuracy for masked angry trials and misinterpreting neutral faces as sad and/or fearful significantly more when masked than not. Response tendencies were identified by examining confusions of neutral faces, but it is unknown if tendencies when viewing masked faces are specific to SA or if they are more generally applicable.

Accuracy

Consistent with previous research regarding the impact of masks on emotion recognition (Carbon, 2020; Gori et al., 2021; Grundmann et al., 2021), accuracy was impaired for masked trials. Accuracy was not significantly different for neutral trials based on masking, however, accuracy for neutral unmasked trials was lower than accuracy for other unmasked trials. This may have been due to one of the distractor emotions used, namely "content," being similar to "neutral." As seen in Figure 3, more than half of incorrect responses for neutral unmasked trials were content ($M = 54.78\%$).

In addition, among all types of masked trials, the present study's SA participants displayed the highest accuracy for masked angry trials. This is consistent with previous research which found that SA participants correctly identified low intensity displays of disgust and anger more often than non-anxious controls (Gutiérrez-García & Calvo, 2017), as participants in both studies identified ambiguous expressions of anger correctly. If this is specific to SA individuals, it may imply greater motivation or ability to identify ambiguous expressions of anger. Further, this relates to prior findings of hypervigilance for threat faces by SA individuals (Klumpp & Amir, 2009; Mogg et al., 2004), as anger is a social threat emotion.

Incorrect Response Tendencies for Neutral Trials

As aforementioned, neutral faces were confused as fearful and/or sad more frequently when faces were

masked than not. These response tendencies are particularly interesting and may reflect participants' personal feelings during the pandemic. Notably, the mean percentage of neutral masked faces confused as sad ($M = 57.32\%$) was larger than the percentage confused as fearful ($M = 5.62\%$). Perhaps the tendency to misinterpret neutral masked faces as sad could be explained by the projection of depressive symptoms. There is reason to speculate such, as depression increased in prevalence since the pandemic began. Early in the pandemic, the prevalence of moderate to severe depression in U.S. college students was approximately 36.2% (Lee et al., 2021), while prior to the pandemic, 25.67% of U.S. college students had scores indicative of possible major depression (Acharya et al., 2018). Moreover, depression is the most common comorbid condition for individuals suffering from SAD, with 35-70% having this comorbidity based on several clinical studies (Koyuncu et al., 2019). Given these statistics, the prevalence of depression in this sample was potentially high. If so, the sad response tendency may reflect participants projecting their own negative emotions onto the neutral faces viewed, particularly when ambiguous due to masking.

Importantly, projection of one's own affective state when interpreting the emotions of others is supported by research. For example, Trilla et al. (2021) observed the phenomenon of emotional egocentricity when participants' affective states were manipulated before an emotion perception task. Participants were more likely to judge faces as sad when they were experiencing sadness as opposed to happiness, indicating that projection affects the perception of facial expressions. Furthermore, in a study comparing the responses of depressed, remitted, and healthy control individuals, Leppänen et al. (2004) found an impairment in the recognition of neutral faces. Specifically, depressed and remitted patients tended to mistake neutral faces for emotional faces (e.g., sad or happy), although false happy responses occurred more in the group of remitted patients. Given this strong evidence for perception of neutral faces as sad in those with depressive symptoms, along with the phenomenon of emotional egocentricity shown by Trilla et al. (2021) and the prevalence rates of depression mentioned previously, projection of depressive emotions may have impacted interpretations of neutral masked faces in the present study.

In contrast, several prior studies have shown a bias for interpreting neutral faces as threatening in SA in

dividuals (Gutiérrez-García & Calvo, 2017; Yoon & Zinbarg, 2008), which was not replicated here. The present results illustrate that SA participants most frequently confused neutral faces as sad when masked, while Gutiérrez-García and Calvo (2017) found that SA individuals were less likely than non-anxious controls to interpret neutral faces as sad. This inconsistency suggests a mask-specific effect, however, it is unknown whether this is generalized or SA-based. Although the neutral threat bias, such as that shown by Yoon and Zinbarg (2008), was not present for neutral unmasked trials either, the presence of prior masked trials may have impacted this, and thus, the previous findings are not refuted. Further, the methodology may not have allowed for enough SA variation to produce similar results. The present study recruited participants with a minimum score, whereas previous studies selected extreme scores from a participant pool (Gutiérrez-García & Calvo, 2017), used median split grouping (Klumpp & Amir, 2009), or clinician diagnosis grouping (Mogg et al., 2004).

Limitations

The present study had several important limitations. First, it did not include a low- or non-anxious group due to the limited scope of this study, being that it served as a first-year project leading up to a master's thesis. Inclusion of a control group would aid in elucidating whether the identified mask-related response tendencies are specific to SA. Second, the researcher lacked access to a clinical sample, relying on a brief SA scale for pre-screening, which was not as highly correlated with the full scale as expected (Peters et al., 2012), suggesting measurement problems. Third, ecological validity should be considered, as static images are unlike real life, where movement and contextual information facilitate emotion interpretation.

Implications and Future Research

Despite the limitations, the present findings contribute information to the research gap on populations that may be uniquely affected by the challenges associated with mask-wearing. As predicted, emotion identification accuracy was impaired for masked trials, however, neutral masked trials were misinterpreted differently than expected (as sad rather than angry). These findings can inform clinicians about how those with SA interpret the emotions of masked individuals, contributing to an improved understanding of pandemic-related effects when providing treatment.

The mental health effects of the incorrect response tendencies identified here should be considered, as individuals with SA attribute excessive social cost to negative emotions, including fear and sadness (Button et al., 2013). Importantly, neutral masked faces were most often confused as sad, with this occurring significantly more than when unmasked. If SA individuals often misinterpret neutral masked faces as sad, this may cause greater anxiety for these individuals when in social situations due to their attribution of excessive social cost to interacting with individuals displaying sadness. Furthermore, these findings may bring increased awareness to possible differential effects of masks on other neurodivergent populations. Future research could examine the effects of masks on emotion interpretation in other populations typically affected by interpretation biases to determine whether the known effects are altered by the presence of masks.

In addition, the higher accuracy shown for masked angry trials may reflect greater motivation or ability of SA individuals to identify these social threat emotions, which can be explained by their hypervigilance for threat faces (Klumpp & Amir, 2009; Mogg et al., 2004). These results reinforce prior findings of hypervigilance for ambiguous threat faces, demonstrating that this effect is also applicable to situations when SA individuals view masked angry faces. However, the previously identified neutral threat bias, which is characteristic of SA, was not reproduced here, suggesting that this effect may not be present when viewing faces during the pandemic. Instead, a different emotion interpretation bias in which neutral masked faces were most often misinterpreted as sad, may have taken precedence. This bias may result from the projection of depressive emotions, as depression is the most common comorbidity of SA and its prevalence increased during the pandemic. Future research should examine the role of both SA and depression in interpreting the emotions of masked faces and should prioritize the inclusion of a low- or non-anxious control group.

Acknowledgements

The author wishes to thank Dr. Kim Shifren for her continued mentorship and valuable insight, Dr. Justin Buckingham for consultation on study design, Dr. Jeff Kukucka for statistical suggestions, and Ryan Rosenthal for his critical review of the manuscript and support throughout.

Declaration of Interest Statement

The author reports no conflict of interest.

Data Availability Statement

The data that support the present findings are openly available in Open Science Framework at <http://doi.org/10.17605/OSF.IO/VM4DC>.

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EFFECTS OF FACE MASKS IN SOCIALLY ANXIOUS INDIVIDUALS

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Figure 1

Emotion Identification Task Image Examples

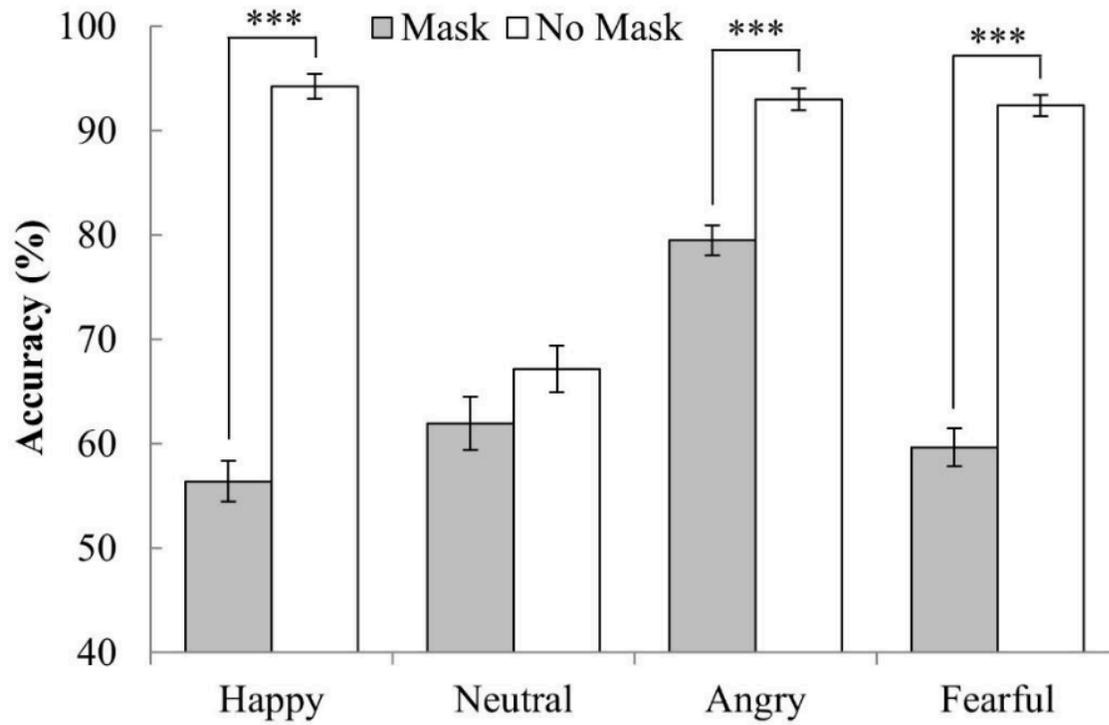


Note. Although the same individual is shown here, this is for illustrative purposes only, as no individuals were included more than once in the task. For this individual, the expression shown is neutral and the mask-edited image was used in the task. CFD stimulus code: CFD-WF-211-001-N. (a) original CFD image. (b) mask-edited CFD image.

EFFECTS OF FACE MASKS IN SOCIALLY ANXIOUS INDIVIDUALS

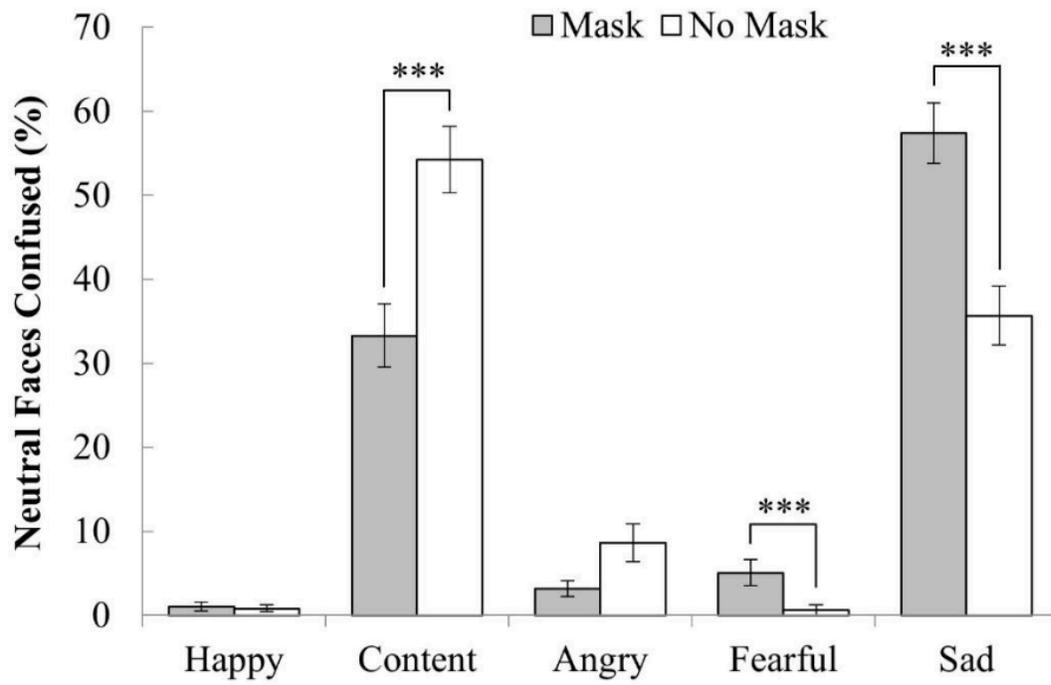
Figure 2

Emotion Identification Accuracy Among Masking and Expression Conditions



Note. $n = 87$.

*** $p < .001$.

Figure 3*Neutral Trial Incorrect Choice Selections**Note.* $n = 80$.*** $p < .001$.

Autism Spectrum Disorder and Face Identity Recognition Deficit across Ages

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The purpose of this review was to assess the face identity recognition deficit and the developmental difference that manifested in autism spectrum disorder (ASD) compared to their typically developing (TD) peers. Based on the meta-analysis using a random-effect model of 94 studies, with 144 effect sizes, for both adult and pediatric subjects with simultaneous and delayed face identity recognition paradigms, the underperformance in ASD was significant and persistent across ages. In addition, a higher level of deficit was found in adult ASD when performing simultaneous face-matching tasks while other subgroups showed homogeneous effect sizes. This suggested a dissociation between the difficulties of the two mechanisms of face recognition: face perception (perceiving identity from the face with minimal memory load required) and face memory (recall of identity from the face that requires memory load), which was only shown in adults but not in children. The result indicated the possibility of using face identity recognition deficit as a diagnostic trait for ASD.

Autism spectrum disorder, or ASD, is a neurodevelopmental disorder with symptoms such as difficulties in social communication and social interaction, and restricted patterns in behaviors, interests, and activities (APA, 2022). According to the Centers for Disease Control and Prevention, around one in 44 children has a diagnosis of ASD, and the prevalence has been continuously increasing (CDC, 2022). When the concept of autism was first brought up in 1908 by Swiss psychiatrist Eugen Bleuler, it was considered a cognition and behavior style that occurs in patients with schizophrenia (Evans, 2013), and was recognized as childhood-type schizophrenia in the second version of Diagnostic and Statistical Manual of Mental Disorders, DSM-II (Kendhari et al., 2016). In DSM-III, published in 1980, autism was officially recognized and introduced as an isolated disorder of pervasive developmental disorders. The diagnostic criteria were further specified in the later revised version of DSM-III, DSM-III-R (Volkmar et al., 1988). In 1994, the fourth version of DSM specified autism as autistic disorder, Asperger's disorder, and pervasive developmental disorder, not otherwise specified (PDD-NOS), which were then all classified as autism spectrum disorders, ASD, in the current version of DSM (Harker & Stone, 2014).

Although diagnostic labels and criteria change drastically for ASD, the core deficit presented in the disorder remains the same. Impaired social cognition, debilitated communication skills, and ritualized behavior patterns are core deficits commonly occurring in ASD (Faras et al., 2010). These deficits are included in the diagnostic manual for ASD, for their potentially discriminative characteristics from other disorders, and can significantly impact daily functioning. Many

aspects of manifestation of these deficits, including facial emotion recognition deficit (Uljarevic & Hamilton, 2013; Lozier et al., 2014; Keung, 2022), delay in language development (Mitchell et al., 2006; Landa & Mayer, 2006; Eigsti et al., 2010), reading comprehension deficit (Norbury & Nation, 2010; Ricketts, 2013) and other impairment have been extensively studied. They have shown different underlying mechanisms and developmental trajectories for these shortfalls, but all contributed to the dysfunction of the disorder.

Face perception, which is an essential part of social interaction and communication, is an innate ability that occurs as early as 9 minutes after birth. It is defined as the ability to recognize, process, and integrate information from faces, which include direction of gazing, expression, identity, hostility, etc. (Ward & Bernier, 2013; Palermo & Rhodes, 2006). Disruption in the systems, or unsuccessful face processing, can elicit prominent changes in social behaviors in some psychiatric disorders including ASD (Lopatina et al., 2018). The social functioning deficit in people with diagnosed ASD may partially be explained by the impairment in face perception, which manifested as unsuccessful extraction of identification, emotion, and psychological information from faces during interpersonal interaction (Todorov et al., 2012). The manifestation of the deficit in face perception in the early stage of the face perception in ASD is the tendency of avoiding eye contact. This is also an early indication of children presenting symptoms of ASD, if they present an aversion to direct eye contact from caregivers and others. The avoidance of eye contact is also directly linked to socioemotional dysfunction in ASD (Kliemann et al., 2010). Two general models were proposed

data on the face identity process. After duplicates were removed, full-text articles were screened for eligibility.

Inclusion Criteria

The inclusion for the final meta-analysis: a) is an empirical study published in English. b) included an ASD group with diagnosed ASD, autism, Asperger, or PDD-NOS. c) include a typically developing, chronological age-matched, comparison group. d) include data on participants' age. e) include a homogenous adult or pediatric group of participants or have separate data for different age groups (Categorization of adult and pediatric groups used an age cutoff of 18 years of ages). f) used static images with real human faces that are not the participants' own faces. g) include data on the types of tests performed, face identity recognition tasks or face identity discrimination tasks. h) reported accuracy data of participants' performance on the tasks.

Data Extraction

Data was extracted from every paper that satisfied the inclusion criteria, and all data were input onto Microsoft Excel sheets. Results for studies with adult or pediatric participants were recorded separately, but the categories of data extracted were the same as follows: a) Authors and year the article was published. b) demographic data of ASD and TD control groups, including sample size, gender distribution, mean age, and the standard deviation of age, Intelligence quotient, the standard deviation of IQ, and the diagnostic tool implemented. For studies that were carried out with multiple groups of participants, data were recorded independently and classified in accordance with their characteristics. c) Type of task implemented on face identity recognition or discrimination ability. The tasks implemented for each study were categorized into simultaneous or delayed categories. The simultaneous face identity recognition test, which is also categorized as the simultaneous face identity discrimination test, was a simultaneous match-to-sample test, in which, the target stimuli and test stimuli were presented simultaneously. This type of task was adopted in the widely used face identification task, Benton facial recognition test. The simultaneous match-to-sample task did not require memory load to perform an accurate matching of faces (Duchaine & Weidenfeld, 2002; Duchaine & Nakayama, 2004). On the other hand, a delayed match-to-sample task, which in Weigelt et al. (2013) and Griffin et al. (2021) was also identified as face discrimination, did require memory load and the

amount of memory load required was directly related to the length of time delayed between the presentation of the stimulus (Anderson & Colombo, 2019). Therefore, the rationale behind the categorization was the requirement of memory load. The simultaneous task demanded no memory load and the delayed task required at least some memory load to perform. Studies that used both types of tests were recorded individually in each section. d) Effect size of the difference in accuracy performance between ASD and TD groups. If effect sizes were not provided, statistical data required to calculate the standardized mean difference were extracted. Sample sizes, means, and standard deviations of behavioral results for both groups were extracted for calculating the effect sizes. If these data were not provided, inferential statistics of comparison between groups were collected to estimate effect size. For studies that performed multiple experiments, the data for each experiment was recorded separately based on their participants' characteristics or the type of task performed.

For studies that reported demographic information and performance results individually for each participant, the mean and standard deviation data were calculated manually for pediatric and adult participants groups. In some cases where neither the effect size nor specific data of results were textually available, but graphic representations of data were presented, the online application, WebPlotDigitizer was used to extract the necessary data. Numerous studies had shown consistent validity and reliability of numerical results extracted from graphic inputs using WebPlotDigitizer (Drevon et al., 2016; Aydin & Yassikaya, 2022).

The calculation of standardized mean differences was done manually by inputting equations with Excel functions. Most of the studies provided effect sizes in Cohen's *d* value as the standardized effect size. It has been noticed that Cohen's *d* values tend to overestimate the actual effect sizes when sample sizes are small. On the other hand, Hedges' *g* removes the bias with a correction factor. (Lin & Aloe, 2021; Durlak, 2009) Most studies included in the current meta-analysis did not have large sample sizes. Therefore, it might be prone to an upward bias if using Cohen's *d* for calculating the effect sizes. On the other hand, Hedges's *g*, which can easily be transformed from Cohen's *d*, was more reliable in the current meta-analysis. Therefore, for other studies that require manual calculation, Cohen's *d* values were first calcu

lated and then transformed into Hedge’s *g* together.

The formula for calculating the Cohen’s *d* was (Cohen, 1998; Lipsey, 2001):

$$\text{Cohen's } d = \frac{x_2 - x_1}{\sigma_{pooled}} \quad (1)$$

where x_1 and x_2 were mean values and the pooled standard deviation, σ_{pooled} is calculated as:

$$\sigma_{pooled} = \sqrt{\frac{(N_1-1)\sigma_1^2 + (N_2-1)\sigma_2^2}{N_1+N_2-2}} \quad (2)$$

where N_1 and N_2 are sample sizes, and σ_1 and σ_2 are standard deviations for each group. For studies that did not provide sample size, mean, or standard deviation, the equation used to convert values from *f*-test (3) or *t*-test (4) value to Cohen’s *d* were (Thalheimer & Cook, 2002; Lipsey, 2001):

$$d = \sqrt{F \frac{N_1+N_2}{N_1N_2}} \quad (3) \quad d = t \sqrt{\frac{N_1+N_2}{N_1N_2}} \quad (4)$$

After all Cohen’s *d* were calculated, the calculated effect sizes were then converted into Hedges’ *g* value, along with the provided Cohen’s *d* effect sizes. The conversion formula used was (Hedges, 1981; Borenstein et al., 2011):

$$g = d \times \left(1 - \frac{3}{4(df)-1}\right) \quad (5)$$

Where $df = N_1 + N_2 - 2$. The standard errors of Hedges’ *g* (6; Hedges, 1981; NIST, 2018) were calculated for further analysis:

$$g_{se} = \sqrt{\frac{N_1+N_2}{N_1N_2} + \frac{g^2}{2(N_1+N_2)}} \quad (6)$$

Risk of Bias Evaluation and Quality Assessment

An evaluation matrix of the studies’ design and methodology was adapted from previous meta-analyses (Griffin et al., 2021; Yeung, 2022; Tang et al., 2015). For every study, their evaluations were based on the quality of participants’ selection procedures and the characteristics of the instruments implemented. For assessing the reliability of the sample subjects representing the intended target population, the demographic characteristics were assessed and compared to ensure the result performance data extracted were a representation of the group difference with minimal mediation from other properties. Whether data on participants’ age, gender, and IQ were provided for both ASD and TD groups, and whether these characteristics are matched to control for effects that can potentially bias the result, were significant determinants of the studies’ quality.

On the other hand, aside from many established tests targeting face identity recognition measurement:

CFMT (Cambridge Face Memory Test), Benton Facial Recognition Test, NEPSY-II (Developmental Neuropsychological Assessment, Second Edition), face subtest, etc., many studies developed their own testing procedures evaluating the performance. Within established tests, the materials used and courses of action varied largely from each other. There was not a general consensus on which test was best in reliability and validity in rating the identity recognition ability specified in the ASD population (Duchaine & Weidenfeld, 2002; Albonico et al., 2017). However, some material characteristics were preferred that tend to be more consistent in conveying reliable results. Compared to black-and-white, or grayscale photos of faces, colored photos had been shown to carry more information that was not related to faces. For instance, when photos of faces were presented in color, chunking areas of faces according to different tones or shades became possible. Instead of remembering and recognizing a person’s face from their facial features, the mechanism then became remembering patterns of color segments (Bindemann & Burton, 2009; Yip & Sinha, 2010; Bobak et al., 2019). Similarly, photos of full faces, including hair and clothing, provided excessive information that was not related to facial features when testing the identification ability. More significantly, when subjects were not able to extract sufficient information from facial features alone, they were more likely to rely on external information, hairstyle, brow shapes, etc (Duchaine & Weidenfeld, 2003). In addition, different facial expressions also were shown to impact identity recognition (Chen et al., 2015). With the ASD population, whose recognition of facial affect is impaired, the ambivalent effect can lead to biased results. Therefore, for achieving consistent reliable results, the method implemented with grayscale photos of inner face features alone with neutral expression was preferred. The evaluation is done in rating format. Each criterion is marked as one point for each study on whether it provides the necessary information for each criterion. The study’s quality is the sum of scores on each criterion and the maximum quality score is 12 points.

Statistical Analysis

With the calculated Hedges’ *g* and standard error of Hedges’ *g* value, the data were input into SPSS v. 28 for meta-analysis. Analysis was performed using a random effect model with the Hunter-Schmidt method (Hunter & Schmidt, 1990). Fixed-effect model

hypothesized a universal effect size for all studies and proposed a similar methodology across studies in the meta-analysis (Field & Gillett, 2010). On the other hand, the random-effect model assumed that every study estimated a different inherent relation and appraised both between-study and within-study variability (Kock, 2009; Tufanaru, 2015). The Hunter-Schmidt method is a method using a random-effect model and it was shown to produce the most accurate and reliable estimates when heterogeneity exists in effect sizes (Cornwell & Ladd, 1993; Field, 2001). In addition, forest plots and funnel plots were produced with SPSS plotting functions for meta-analysis. Forest plots provide a vivid visual representation of the overall effect of the meta-analysis and effect size of individual studies used to generate the results. The meta-analyses were performed in accordance with these procedures.

First, an overall meta-analysis of every study was performed to estimate the difference in accuracy performance on face identity recognition between ASD and TD populations. Random-effect meta-analysis was performed with all data included and forest plots were produced. In addition, evaluation of heterogeneity and homogeneity were carried out to inspect the variability across studies. Furthermore, an assessment of publication bias was also implemented to further specify and solidify the results.

Then, a meta-analysis of studies within each age group and a comparison of results across ages were inspected. Similar procedures that were executed for evaluating the overall effect size were performed for the pediatric group and the adult group. The comparison between groups was assessed with an estimation of the homogeneity of the two groups as a subgroup analysis of the overall effect. Additionally, subgroup analyses of methodology effects within each age group were performed. This analysis examines whether the two kinds of face perception, with and without memory load, show different performance between ASD and TD at different age stages.

On the other hand, a hypothesis by Weigelt et al. (2013) was tested. Weigelt et al. (2013) proposed that face identity recognition deficit in ASD was specific to face memory deficit, in which the higher demands in memory load would lead to worse performance in ASD. For tests that did not require face memory, the performance between ASD and TD should be the same. Even though Griffin et al. (2021) had

shown results opposite to this hypothesis, Griffin et al. (2021) studies examined the difference between face identity recognition and face identity discrimination tasks. The divergence between these two tasks was not clearly defined in either the Weigelt et al. (2012) or Griffin et al. (2021) study. As mentioned in Tang et al. (2015), the definition of face discrimination was ambiguous. Therefore, a dichotomy classification was used to be more robust and specific.

Evaluation of Publication Bias

To evaluate potential publication bias, a funnel plot and Egger's regression were used. A funnel plot is a visual representation of comparing the sizes of trials to their effect size. Usually, studies without publication biases would produce a plot that is symmetric and shaped like a funnel. If the resulting plot was significantly asymmetric, this indicated a potential publication bias (Lee & Hotopf, 2012; Simmonds, 2015). Interpretation from graphics alone can be unreliable so Egger's test is also used. Egger's regression test is a test based on a linear regression model comparing the intercept, which evaluates the asymmetry of the funnel plot. Egger's test examines the hypothesis of zero linear intercept, which represents a symmetric funnel plot with no publication biases (Egger et al., 1997).

Results

Study Selection

The literature selection and screening process was shown in the flow diagram, Figure 1. An initial database and references search gave 7,432 results, including 1,975 from PubMed, 5,345 from PsycINFO, and 112 from Griffin et al. (2021) references list. With the PsycINFO filter, 299 articles that were not written in English and 1,151 articles that were not empirical research studies were removed. Then, a total of 5,602 studies were eliminated because they did not include information on ASD or face processing. After removing 82 duplicate papers, 298 unique papers related to autism spectrum disorder and face processing were reviewed in full-text screening. 204 papers, in total, were eliminated based on inclusion and exclusion criteria: a) 15 articles were not empirical research papers. b) 30 papers were not studying face processing in the ASD population or did not include participants with diagnosed ASD. c) 13 studies did not have a comparison group or did not compare to the typically developing population. d) Seven papers did not provide informa-

ASD AND FACE IDENTITY RECOGNITION DEFICIT

tion on participants' age range, and e) 19 papers have a heterogeneous age that include a mix of adult and pediatric participants. f) Six studies did not use static real human faces, whereas three studies studied self-recognition. i) 114 studies involved face processing in ASD but did not include behavioral results concerning their face identity recognition or discrimination ability.

A total of 94 studies satisfied all the inclusion criteria and were included in current meta-analysis, with 4,849 total number of individual participants, 2,351 with ASD and 2,498 TD comparisons. The general characteristics of participants in the 94 studies are shown in Table 1. The overall average age of pediatric ASD participants was 10.99 ($SD=2.51$), and pediatric TD participants with mean age of 10.64 (2.93). The mean age between the ASD and TD groups did not differ significantly; $t(144)=0.768$, $p=.444$. The overall mean age of adult ASD participants was 28.48 ($SD=4.6$), ranging from 20.60 to 43.2; the mean age for adult TD subjects was 28.19 ($SD=4.52$), with a range of 21.6 to 44. The mean ages between the two groups did not differ significantly; $t(58)=0.249$, $p=.8041$.

Studies were also categorized based on the test characteristics, either a delayed design or a simultaneous presentation design. The number of studies with different characteristics is shown in Table 2.

Overall Face Identity Recognition Ability

First, the overall difference in face identity recognition was evaluated. Meta-analysis was performed with a total of 94 papers and 144 pairs of results of effect size between ASD and TD. All results were included to assess the overall difference in facial identity recognition ability between the ASD and TD groups. Of the 144 effect sizes from studies, 17 reported a positive effect size, which indicates a comparatively higher performance in ASD than the TD control group. In addition, three studies reported an effect size of 0, which indicated an equal level of performance between the two subject groups. All other 124 results showed a lower level of performance in ASD subjects than in TD control subjects.

Figure 3 shows the forest plot representing the result of a random-effect meta-analysis on overall face Identity Recognition ability in ASD. The results show a large overall effect size, Hedges's $g = -.716$, 95% CI $[-.835, -.597]$, $p<.0001$. Indicating a significant overall deficit in ASD population on face identity recognition.

On the other hand, the heterogeneity measures of all 144 effect sizes from the studies show a signif-

icant heterogeneity, $\tau^2 = .405$, $I^2 = .803$. The homogeneity test also confirmed the variances between the studies' effect sizes, $Q(143) = 731.35$, $p = .00$. These results show a large heterogeneity in effect sizes. In addition, the I^2 result confirmed that 80.3% of variances can be attributed to the heterogeneity of studies.

The funnel plot in Figure 2 shows the studies are roughly symmetrical, which indicates no potential publication bias. In addition, Egger's regression-based test also confirmed the absence of biases with an intercept of 0.325, 95% CI $[-0.151, 0.8]$, $t = 1.348$, $p=.180$.

Face Identity Recognition in Adult Samples

A total of 39 studies from 30 papers, with statistics from total sample sizes of 1316 participants, were included in the random effect meta-analysis on the adult group. The resulting overall negative effect size on face identity recognition performance between ASD and TD, Hedges' $g = -.753$, showed a significant deficit in the identification ability in ASD subjects. Figure 4 showed the forest plot displaying the effect sizes of each study, which presented an overall lower performance in ASD than in TD. Furthermore, subgroup analysis on the type of test performed were also included. The statistics and visual representations in the forest plot both indicated an outstanding negative effect size. Hedges' $g = -.753$, 95% CI $[-.931, -.575]$, $p<.0001$.

Heterogeneity tests indicated a substantial variation in effect sizes between studies. $\tau^2 = .211$, $I^2 = .682$. The test of homogeneity also confirmed the disparity. $Q(38) = 123.499$, $p<.001$. The I^2 connoting 68.2% of heterogeneity explained by studies' differences was lower than the overall heterogeneity in data with both children and adult data. Egger's regression test of intercept = 0.070, 95% CI $[-0.774, 0.915]$, $p=.867$, which suggested a high level of robustness.

In addition, consistent results were shown in subgroup analysis for both delayed and simultaneous tests. Of the 39 studies' results, 29 studies were performed with delayed recognition tasks, and 10 studies were implemented with simultaneous designs. Heterogeneity testing indicated that for both categories classified based on test procedure, the heterogeneity between studies was on a similar level. For delayed tests, $\tau^2 = .185$, $I^2 = .678$; for simultaneous design, $\tau^2 = .308$, $I^2 = .674$, which both indicated a high level, 67.8% and 67.4% of heterogeneity from variation between studies. However, publication biases were not significant in either design. For delayed tests, in

tercept = -0.451, 95% CI [-1.457, 0.555], $p=.366$; for the simultaneous test, intercept = 2.036, 95% CI [-0.591, 4.664], $p=.112$. Therefore, no studies were excluded from the analysis. Figure 5 presented a funnel plot image for all studied among adult participants, and different methodologies used were labeled with different colored dots.

For studies with adult samples and implemented delayed identity recognition tests, the overall Hedge's g effect size was -.697, 95% CI [-.891, -.504], $p<.001$. For studies with simultaneous design methods, the overall effect size was Hedges' $g = -.954$, 95% CI [-1.377, -.531], $p<.001$. Although the overall effect size for the simultaneous test, $g=-.954$, was larger than the delayed test, $g=-.697$, the Homogeneity test between these two subgroups shows an insignificant effect, $Q(1)=1.17$, $p=0.28$. On the other hand, both significantly negative effect sizes results suggested a deficit in both delayed and simultaneous face identity recognition ability in adult ASD compared to typically developing controls.

Face Identity Recognition in Children Samples

A total of 66 papers with 104 studies of children were included in the random-effect meta-analysis for identity recognition performance difference between ASD and TD. The overall result showed a similar level of effect sizes to the overall effect size with adult subjects. Hedges' $g = -.701$, 95% CI [-.851, -.551], $p=.000$. A subgroup analysis comparing homogeneity of overall effect sizes between ASD and TD for adult and children subjects showed $Q(1)=.187$, $p=.666$. This result indicated no significant difference between the distribution of the two subgroups, children and adults.

In addition, Egger's regression test showed a large but insignificant publication bias. Intercept = 0.43, 95% CI [-0.15, 1.011], $p=.144$. On the other hand, similar to prior results, the heterogeneity across studies included in the analysis was still pronounced. The resulting funnel plot is also shown in Figure 7. Heterogeneity measures show an overall 82.6% of heterogeneity from variation between studies. $\tau^2 = .482$, $I^2 = .826$. The Homogeneity measure also confirmed the significance. $Q(103)=601.67$, $p=.000$. Figure 6 displayed all effect sizes included in the analysis for the children subject group.

Although publication was not significant in the overall analysis of studies, when subgroup analyses were performed for studies implementing delayed and simultaneous design within the children group, the

publication bias estimated by Egger's Regression test predicted a high likelihood of publication bias in the delayed condition, intercept=0.598, 95% CI [-0.067, 1.263], $p=.07$. The result is not statistically significant with $p=.05$, but the borderline significant result indicated a high likelihood of effect of biases from extreme data. After eliminating five sets of data with extreme effect sizes, the possibility of publication bias became minimal and thus the results were more robust and funnel plots are symmetric. Figure 8 displayed the funnel plots before and after extreme data were removed. For delayed groups, Intercept = 0.141, $p=.65$; for simultaneous group, intercept = -0.349, $p=.55$; and for all studies with children, intercept = 0.005, $p=.987$.

The resulting heterogeneity measures were smaller but still significant. For overall effect: $\tau^2 = .281$, $I^2 = .742$; delayed condition: $\tau^2 = .283$, $I^2 = .75$; simultaneous condition: $\tau^2 = .273$, $I^2 = .715$. The estimated effect sizes for both conditions are similar and all negatively significant. For the delayed face recognition condition, the effect size was Hedges' $g = -.628$, 95% CI [-.776, -.48], $p=.000$. For the simultaneous condition, the hedge's g effect size was -.607, 95% CI [-.837, -.377], $p<.001$. The results indicated a noticeable shortfall in face identity recognition in children with ASD compared to TD regardless of memory load requirement of tests, delayed or simultaneous. The subgroup homogeneity test also provided the result that the distribution of performance for delayed and simultaneous conditions was highly similar. $Q(1)=0.022$, $p=.881$.

Furthermore, after removing extreme effect sizes, the evaluated effect size of overall performance for children became slightly less negative. Hedges' $g = -.622$, 95%CI [-.746, -.498], $p=0.000$. Additionally, the result for subgroup homogeneity tests between children and adult subgroups, although still insignificant, decreases, indicating a lower level of similarity of distribution across the two groups. $Q(1) = 1.393$, $p=.238$. Therefore, although removing outlier data increased the robustness of studies data included in the analysis, it did not change the overall underperformance in children with ASD, or the homogeneity in results between children and adult subgroups.

Additional Analysis

Meta-regression analysis weighting the mean age of each study on the heterogeneity of performance for overall result data, and for delayed and simultaneous identity recognition tasks showed

small mediating effects. The largest mediating effect observed was in simultaneous design where of the 71% of heterogeneity, the mean age of participants could account for 3.2% of the variation.

In addition, subgroup analysis was performed on assessing the difference of age groups in different methodology groups. The homogeneity test of studies with children and adult subjects on simultaneous face identity recognition test gave the result, $Q(1)=1.998$, $p=.157$. The test on the homogeneity of studies for both groups on the delayed face identity recognition test resulted in, $Q(1)=0.100$, $p=.752$.

Discussion

The current study examined facial identity recognition ability in Autism Spectrum Disorder, ASD, whether there were changes across developmental stages, and whether there was a difference depending on specific aspects of face recognition. The result from the meta-analysis indicated an overall underperformance in face identity recognition in ASD compared to typically developing control and the deficit was significant.

The overall effect size (Hedges' $g = -.716$) presented a significantly lower performance in the ASD group on identifying faces. For studies that were performed with adult subjects or children participants, the deficits were consistent in both groups. The effect sizes for adult and children groups respectively were Hedges' $g = -.753$, and Hedges' $g = -.622$. Both indicate a significant underperformance in ASD children and adults compared to their TD control. Although the effect size for adults was larger than the effect size for the children's group, which represented a higher level of deficit in the adult population than in children, the homogeneity test shows insignificant results. Therefore, the difference between the results cannot be statistically interpreted as a noticeable change across ages.

Additional subgroup analysis on the interaction between age group and type of test showed a variation in effect size between delayed and simultaneous tests in adult samples but not in children. In addition, only the effect size of performance on simultaneous identity-matching tasks in adults was considered to present a large effect size with Hedges' $g = -.954$ (Cohen, 1998). The effect sizes showing underperformance in other interactive groups showed similar results, which indicates an indistinguishable level of deficits.

The general result of an overall deficit in ASD

compared to TD was consistent with results found in most research studies and concluding remarks from the prior meta-analysis (Weigelt et al., 2012; Tang et al., 2015; Griffin et al., 2021). Of the 144 pairs of effect sizes data extracted from 94 studies for the current meta-analysis, 20 results found either no difference or slightly better results in performance in the ASD group. The differences in findings can be a mixed effect from the differences in the subject's selections and disparity in the quality of the experimental paradigm adopted by the studies. On the other hand, majorities of the studies concluded a deficit in ASD face recognition performance, which is also aligned with results from the current meta-analysis. The consistent deficit suggested a case of developmental prosopagnosia that can potentially be considered as an endophenotype of ASD. There have been continual reports of cases of patients with ASD having difficulties in face recognition (Kracke, 2008; Pietz et al., 2007). In addition, subsets of patients with developmental prosopagnosia also present significant levels of autistic traits (Minio-Paluello et al., 2020; Cook et al., 2015). Therefore, research may need to consider this co-occurrence of the two disorders and potentially the face recognition deficit as an intermediate phenotype of ASD.

Subgroup analysis revealed subtle development changes in performance, which suggested a persistent deficit in face recognition in ASD across ages. The difference in effect sizes occurred only in adults on simultaneous face-matching tasks rather than delayed face recognition tasks, but was not found in children samples, which implied an isolated face perception and face recognition in adults but not in children. This difference could potentially explain the contraction found in the results for Weigelt et al. (2013) and Griffin et al. (2021). Weigelt et al. (2013) initially proposed the deficit depended on memory demand, and Griffin et al. (2021) challenged the hypothesis by showing a significant deficit in both face discrimination and face recognition tasks. Since most studies investigating ASD deficits were performed in children, the overall results with systematic studies would likely present persistent results since ASD children showed constituent deficits across tasks. Although the deficit persists on average, the underlying mechanism of performance differs across ages. Similar results were presented in studies on developmental prosopagnosia, which presented a dissociation in performance

between face perception and face memory in adults but not in children (Dalrymple et al., 2014). In addition, studies in typically developing populations on simultaneous face identity match-to-sample tasks also indicate a decrease in accuracy performance as age increases (Megreya et al., 2015; Schretlen et al., 2001).

On the other hand, the limitations of the accuracy of results for the current meta-analysis also need to be considered. The majority of studies on ASD were conducted with children for it is a neurodevelopmental disorder. The drastic modification of diagnostic criteria of ASD also made the selection and classification of ASD participation complicated. Of the 144 studies included, only 39 studies data were performed on adult participants, and only 10 pairs of data were assessing the simultaneous face-matching ability in adult ASD. With a limited number of studies, the high effect size for adults on simultaneous tasks may be biased. In addition, the difference in studies results can also contribute to heterogeneities in studies results. For future studies, the implementation of a random-effect size model is necessary since the heterogeneity in studies was substantial. A possible resolution can be the inclusion of single design studies in the inclusion criteria, for instance, using only CFMT or Benton for assessing face memory and face perception. However, these limiting criteria would be prone to having a minimal sample size. Therefore, for future research studies, there should be a consideration of the material and procedure used to perform the studies to have reliability and validity across studies and populations. Another limitation of this study was that the study process, including literature search, review, and meta-analysis, was done by the author alone so the inter-reviewer reliability was not assessed for the current study.

Conclusion

Overall the result was significant in that ASD presented a significantly lower level of accuracy in face identity recognition than their typically developing peers. In addition, the deficit persists across age, which may imply potential comorbidity of ASD and developmental prosopagnosia. Nevertheless, the difference in results from the subgroups analysis showing a difference in performance on simultaneous face matching tasks and delayed face recognition tasks indicated a dissociation between face perception and face memory that was only manifested in adults but not children with ASD. However, more

studies focusing on the adult ASD population is necessary to specify the mechanism of this divergence. In general, studies on face identity recognition ability in ASD should consider these factors when deciding on the studies' participants and materials.

References

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ASD AND FACE IDENTITY RECOGNITION DEFICIT

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ASD AND FACE IDENTITY RECOGNITION DEFICIT

Table 1

Demographic Characteristics of the Studies Included in the Current Meta-Analysis

Group	N	ASD		TD	
		N	Age(Std)	N	Age(Std)
Children	66	1701	10.99(2.51)	1832	10.64(2.93)
Adult	30	650	28.48(4.60)	666	28.19(4.52)
Total	96*	2351		2498	

Note. ASD = Autism Spectrum Disorder; TD = Typically Developing; N = Number; Std = standard deviation.

* = Two studies had both adult and children participation groups and were included in both categories.

Table 2*Design Characteristics of Studies Included in the Current Meta-Analysis*

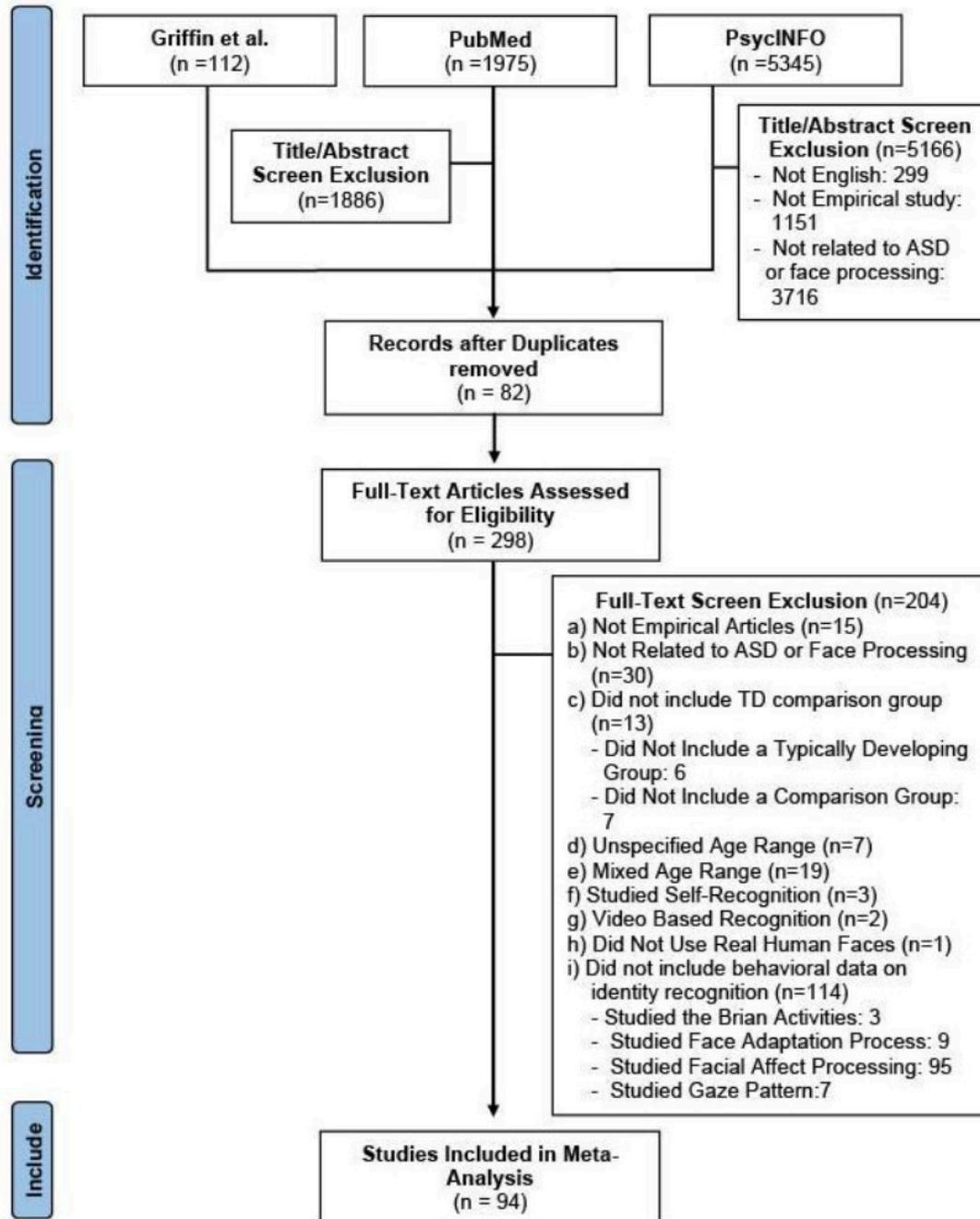
Design	<i>N</i>	Children	Adult
Delayed	71	48	23
Simultaneous	25	18	7

Note. The number indicates the number of studies in each category.

ASD AND FACE IDENTITY RECOGNITION DEFICIT

Figure 1

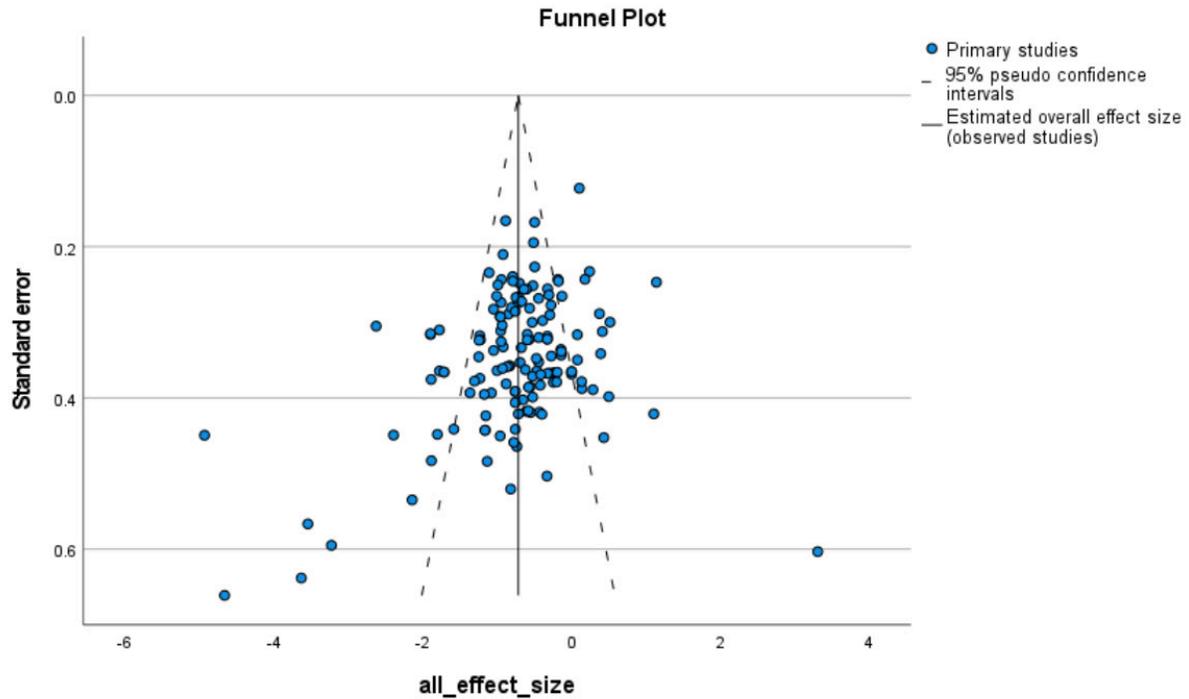
PRISMA 2020 Flow Diagram Showing the Literature Identification and Screening Process



Note. ASD = Autism Spectrum Disorder; TD = Typically Developing.

Figure 2

Funnel Plot of Effect Sizes of all Studies over Standard Errors for Overall Face Identity Recognition

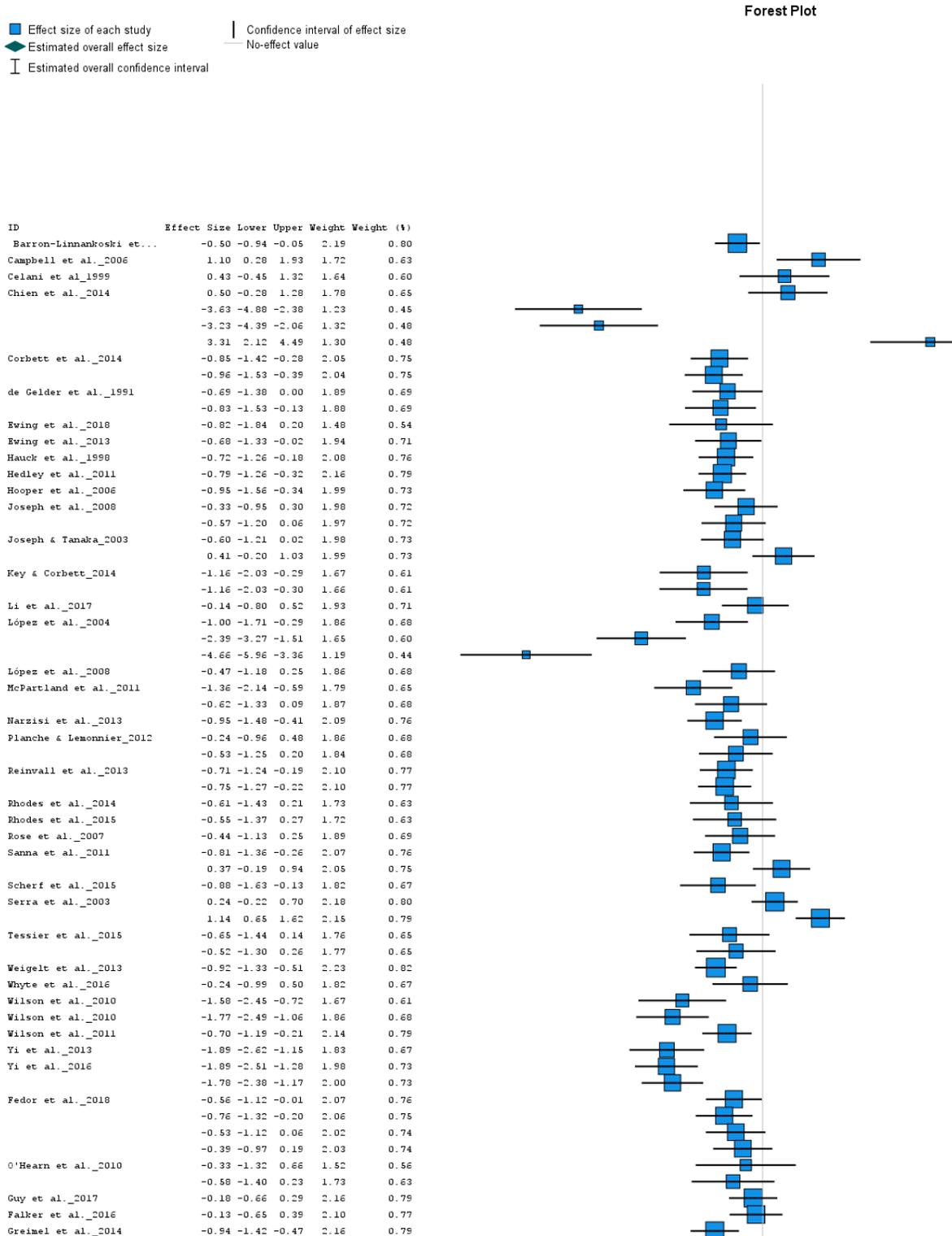


Note. Egger's linear regression test result of $t = 1.348$, $p = .180$ indicated overall symmetry of all studies used in the current meta-analysis.

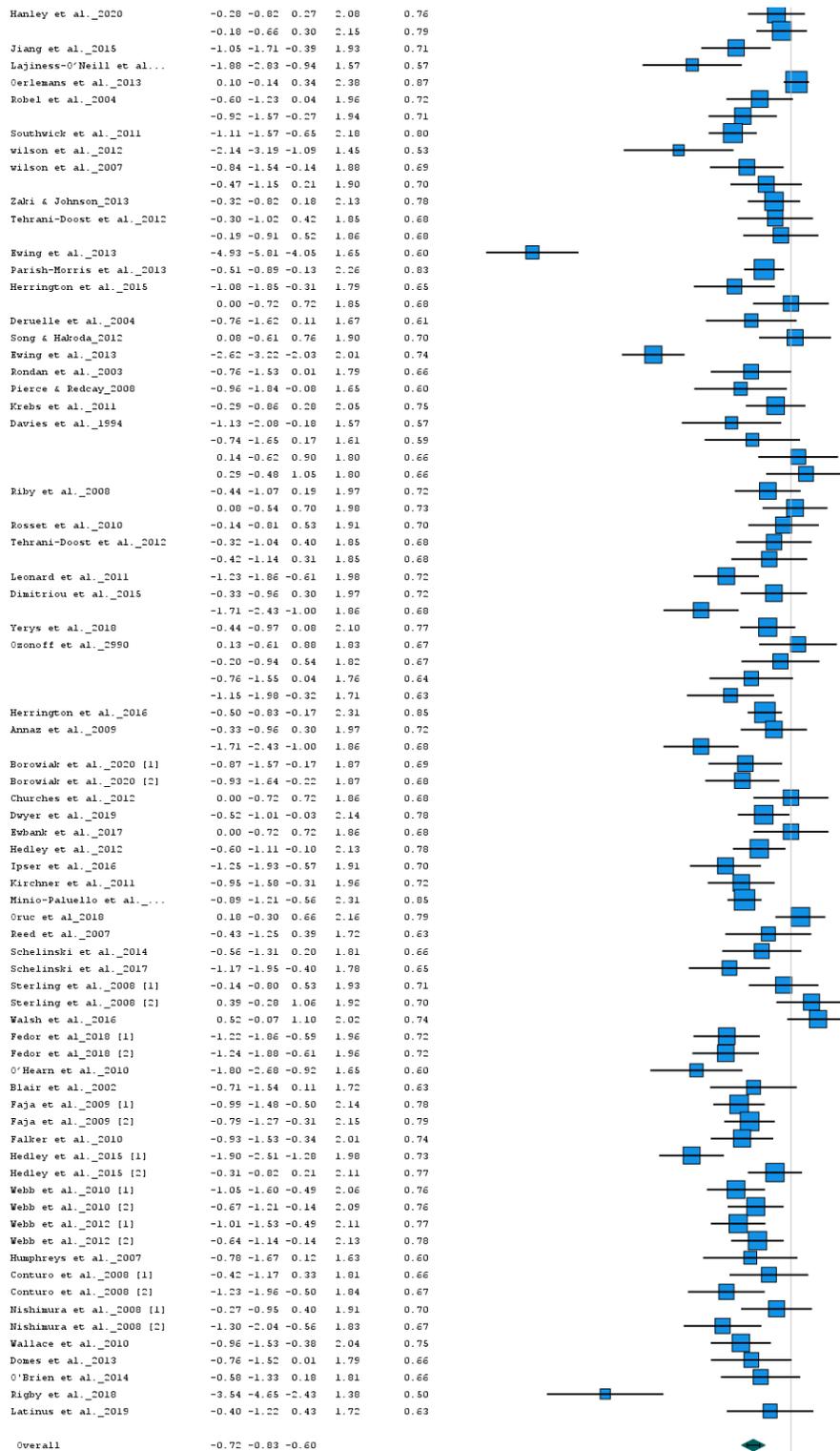
ASD AND FACE IDENTITY RECOGNITION DEFICIT

Figure 3

Forest Plot of the Overall Effect Size of Face Identity Recognition Ability Difference Between ASD and TD Groups



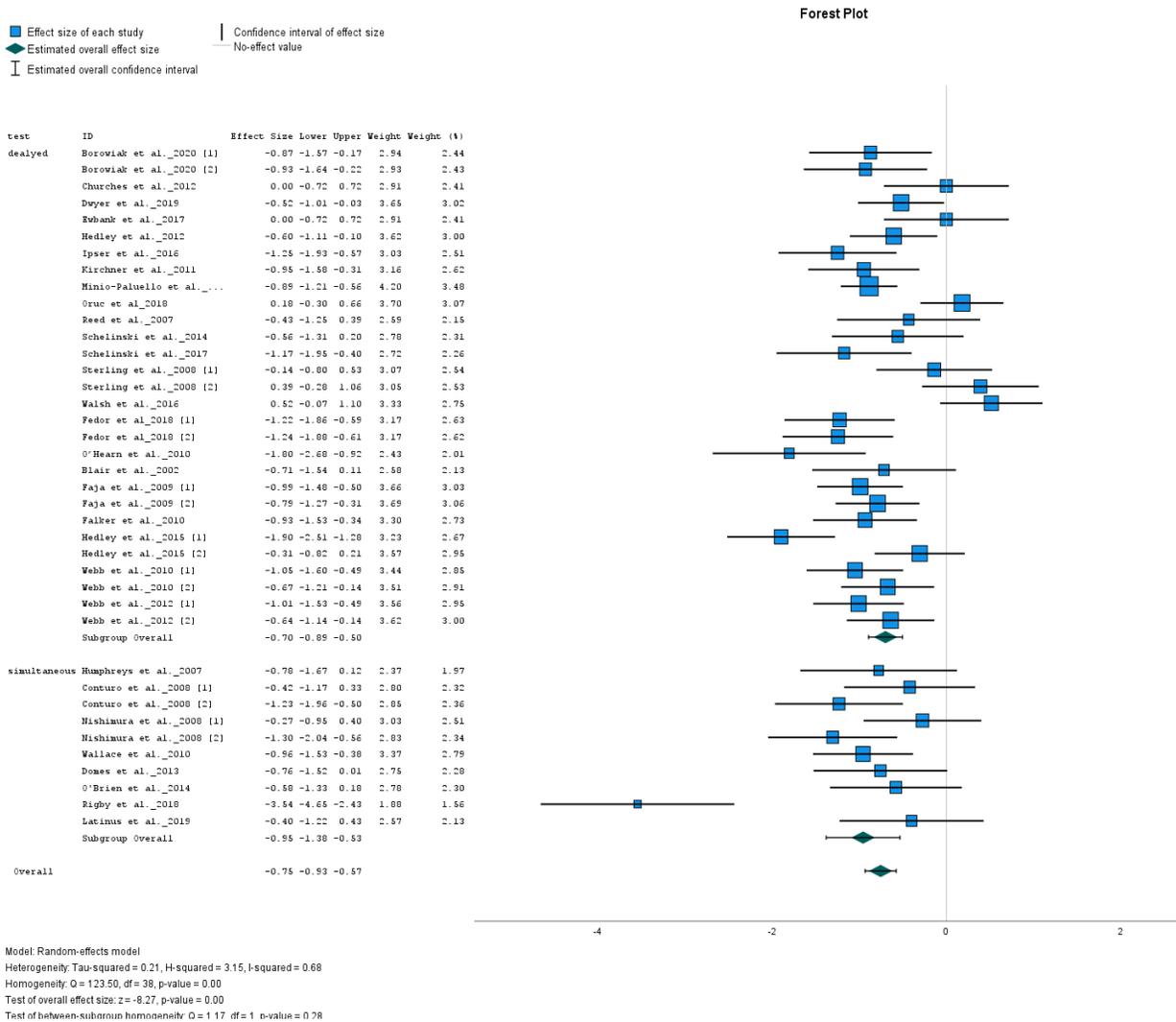
SONG



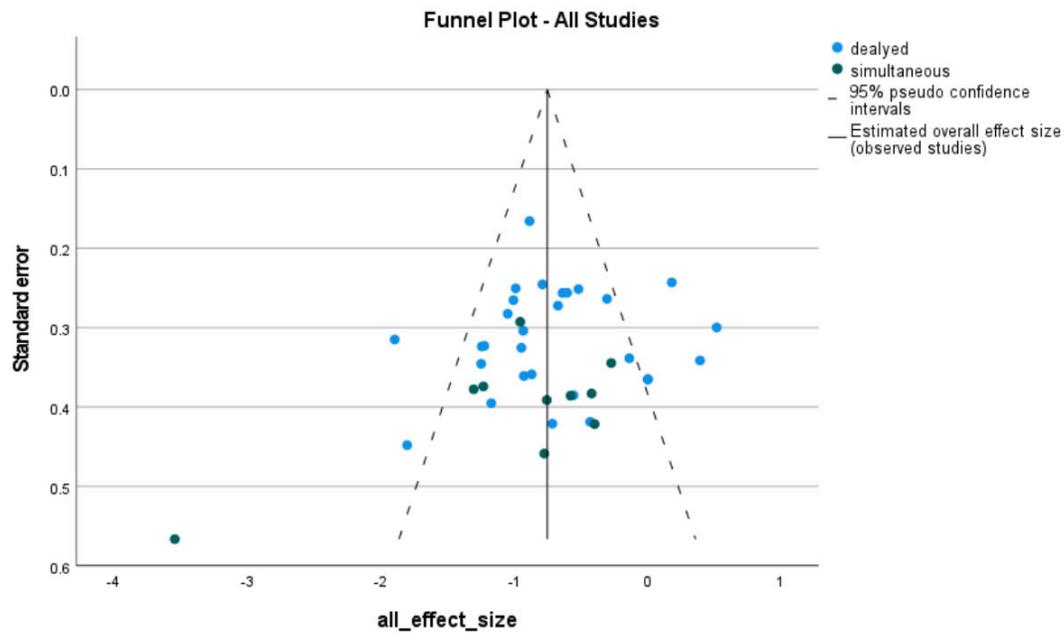
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Figure 4

Forest Plot of Overall Face Identity Recognition Performance in Adult ASD and TD Groups



Note. Forest plot from the meta-analysis using a random-effect model on all studies with adult participants. Overall Hedge's g value = $-.76$; delayed subgroup, Hedges' g = $-.70$; simultaneous subgroup, Hedges' g = $-.95$.

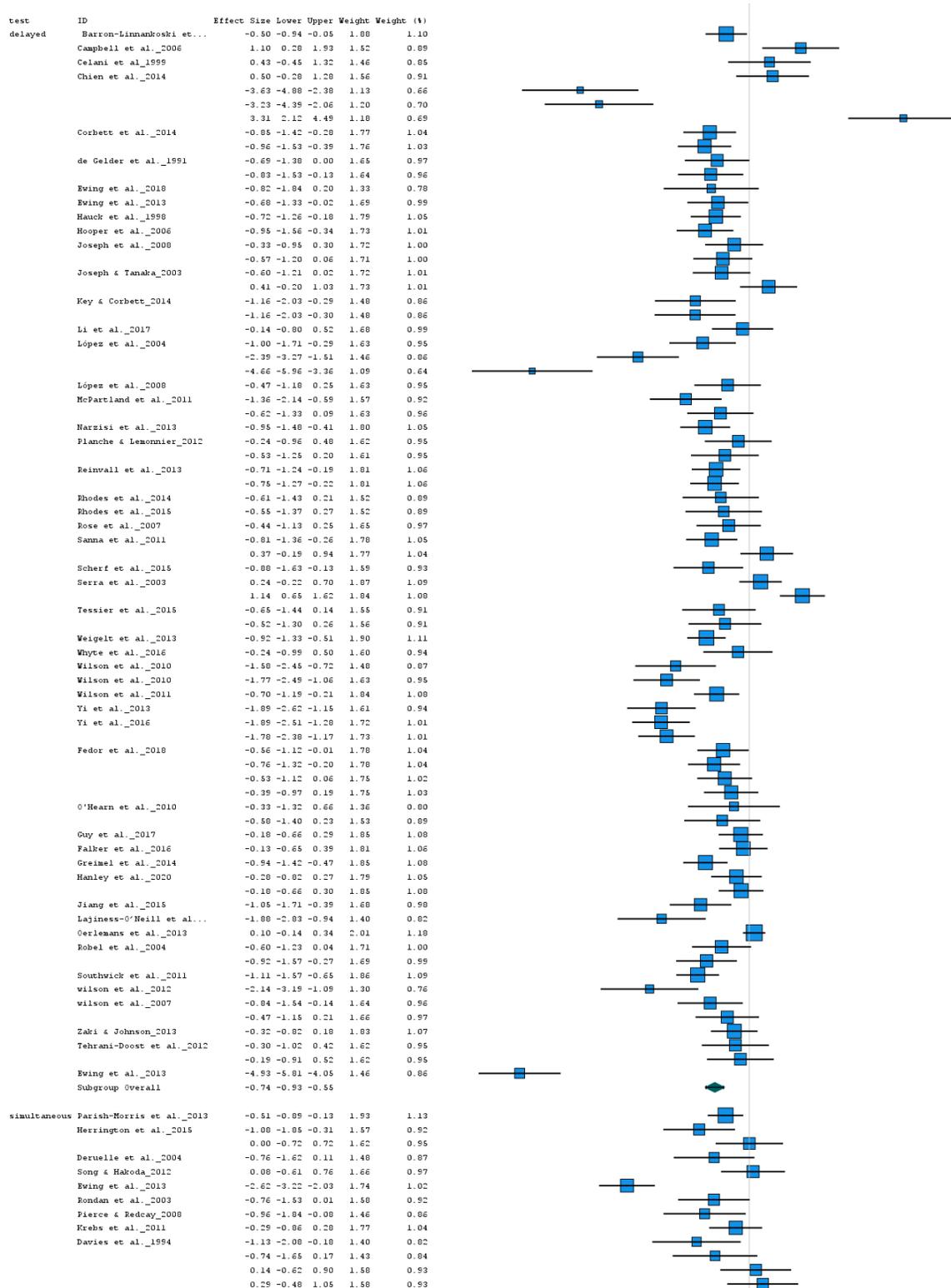
Figure 5*Funnel Plot of Overall Studies with Adult Participants*

Note. Egger's Regression-based test with an overall result of $t=0.169$, $p=.867$, indicated an overall symmetric funnel plot.

ASD AND FACE IDENTITY RECOGNITION DEFICIT

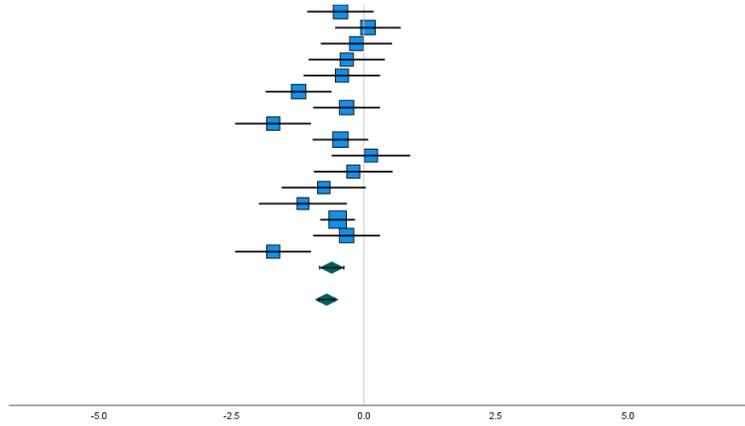
Figure 6

Forest Plot of Overall Identity Recognition Performance in Children with ASD and TD



SONG

Riby et al._2008	-0.44	-1.07	0.19	1.71	1.00
	0.00	-0.54	0.70	1.72	1.01
Rosset et al._2010	-0.14	-0.81	0.53	1.67	0.98
Tehrani-Doost et al._2012	-0.32	-1.04	0.40	1.62	0.95
	-0.42	-1.14	0.31	1.62	0.95
Leonard et al._2011	-1.23	-1.06	-0.61	1.72	1.01
Dimitriou et al._2015	-0.33	-0.96	0.30	1.71	1.00
	-1.71	-2.43	-1.00	1.63	0.95
Yerys et al._2018	-0.44	-0.97	0.08	1.61	1.06
Ozonoff et al._2010	0.13	-0.61	0.88	1.60	0.94
	-0.20	-0.94	0.54	1.60	0.94
	-0.76	-1.55	0.04	1.55	0.91
	-1.15	-1.98	-0.32	1.51	0.89
Herrington et al._2016	-0.50	-0.83	-0.17	1.96	1.15
Annaz et al._2009	-0.33	-0.96	0.30	1.71	1.00
	-1.71	-2.43	-1.00	1.63	0.95
Subgroup Overall	-0.61	-0.84	-0.38		
Overall	-0.70	-0.85	-0.55		



Model: Random-effects model
 Heterogeneity: Tau-squared = 0.48, I-squared = 5.76, H-squared = 8.83
 Homogeneity: Q = 601.67, df = 103, p-value = 0.00
 Test of between-subgroup homogeneity: Q = 0.78, df = 1, p-value = 0.38

ASD AND FACE IDENTITY RECOGNITION DEFICIT

Figure 7

Funnel Plot of Overall Studies with Children Participants

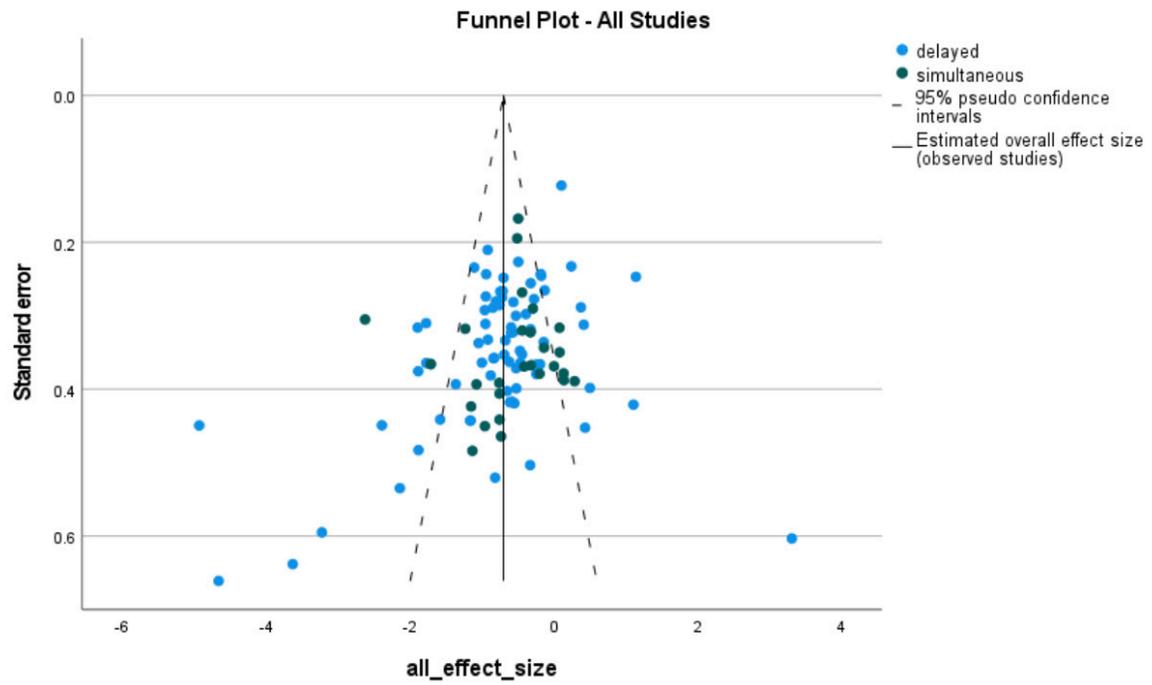
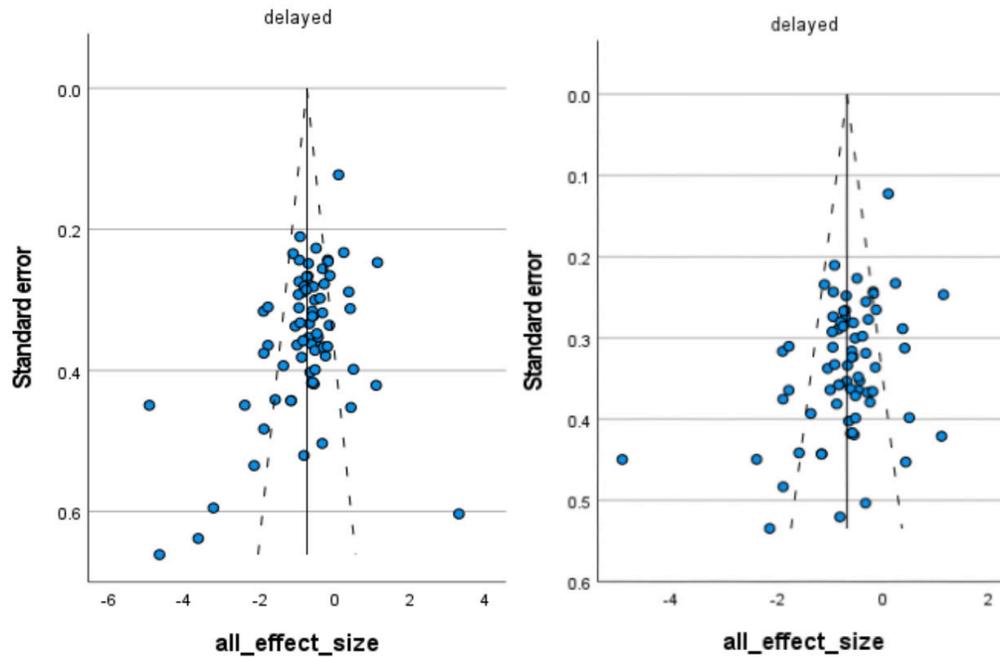


Figure 8

*Funnel Plot of Studies on Children with Delayed Face Identity Recognition Test Before and After
(Extreme Data were Removed)*



Note. The plot on the left showed the funnel plot prior to modification. The plot on the right showed the funnel plot after five studies' data with extreme effect sizes removed.

The Impact of a Brief Humanizing Intervention on Prejudice Towards Transgender Individuals

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Transgender individuals face an abundance of stigma and prejudice from society, making them vulnerable to discrimination, violence, increased stress, and mental health deterioration (Hughto et al., 2015). This study looked at the extent to which a brief humanizing intervention can decrease prejudice against transgender individuals using methods designed to reduce social desirability bias. Unlike past work, the current study implemented a control group that was not subjected to any intervention. Participants ($N=302$) were randomly assigned to one of three conditions: the control condition, the transman letter condition, and the musician letter condition. Only cisgender participants within the gender binary were used in the analysis ($N=293$). The humanizing intervention involved having participants read a letter written by a transgender man in which he comes out to his parents. The musician letter condition involved having participants read a letter written by a young man telling his parents that he is quitting college to pursue a career in music. The control condition did not include any letter. Participants then responded to various dependent measures such as attitudes towards transgender individuals and empathy. Few effects of the intervention were observed, which were inconsistent with past research. However, the results of this study showed an impact on participants' perception of how parents should react to their children coming out and a decrease in the standard gender differences in empathy. Thus, the results offer a nuanced understanding of the extent to which humanizing interventions can reduce prejudice towards transgender individuals.

Keywords: Social Psychology, Prejudice Reduction, Humanizing Intervention, Transgender

Transgender is an umbrella term used to describe people's experiences with gender identity. Transgender individuals are people whose sex assigned at birth does not align with their true gender identity. Transgender men are men who were assigned female at birth and transgender women are women who were assigned male at birth (National Center for Transgender Equality, 2016).

The limited body of literature surrounding people in this community and their experiences has been growing over recent years. This literature consistently demonstrates that transgender individuals face an abundance of stigma and prejudice from society, making them vulnerable to discrimination and violence (Pellicane & Ciesla, 2022). Prejudice is defined as a negative attitude or negative behavior towards a person or a group of people based on their belonging to a certain social group (Allport & Lindzey, 1954). Transgender people are twice as likely to be unemployed compared to the larger population because of laws and policies that allow employment discrimination (National LGBTQ Task Force, 2022). The 2022 National Survey by The Trevor Project showed that 71% of transgender and non-binary youth reported having been discriminated against based on their gender identity. In addition, transgender folk are four times more likely to be sexually assaulted, raped, or assaulted in comparison to their cisgender counterparts (Williams Institute, 2021). Thirty-seven percent of transgender and non-binary youth have reported being physically

threatened or harmed because of their gender identity (The Trevor Project, 2022). Seventy-three percent of these youth experience symptoms of anxiety and 58% experience symptoms of depression and 1 in 5 transgender or non-binary youth have attempted suicide in the past year (The Trevor Project, 2022). Moreover, discrimination restricts transgender individuals from receiving healthcare (Hughto et al., 2015). For example, in Minnesota, around 20% of transgender folk reported that they had been denied healthcare completely and many others said that they have had poor healthcare experiences (Health Partners, 2017).

This discrimination affects the quality of life that transgender individuals have, especially affecting the mental health of transgender folk. Minority stress theory can be used to better understand the rates of mental health hardships that transgender individuals face. Minority stress theory states that marginalized communities experience unique and constant exposure to harsh stressors because of their identity. Due to the presence of such chronic stress and continuous discrimination which stigmatizes these individuals, they are at a higher risk of developing mental health issues (Meyer, 2003). The hardships that transgender folk experience have caused high rates of suicide ideation and attempts among transgender youth (Grossman & D'Augelli, 2010). For example, being misgendered and discriminated against by society can cause transgender individuals to experience significant psychological distress. Additionally, due to high levels of

discrimination, transgender individuals are more likely to experience loneliness and a lack of belongingness to a community. This triggers transgender folk to engage in negative self-appraisal and have low self-esteem and low self-worth. In turn, this leads to higher levels of suicidal ideation and attempts within the transgender community (Hendricks & Testa, 2012). Although society can negatively affect transgender individuals' health, social support, in comparison, can mitigate the presence of psychological distress (McLemore, 2018).

Reducing Transphobia

Although it can be helpful to provide transgender individuals with support and resources to cope with societal discrimination, this support does not directly address nor decrease discrimination. Because the transgender community is subject to higher rates of discrimination and violence, it is imperative to study prejudice reduction methods that can ameliorate the quality of life of trans folk (Tompkins et al., 2015). Although the body of literature in this field has been growing recently, there is still relatively little research looking at the efficacy of interventions that reduce transphobia, or prejudice towards transgender folk.

The existing body of research surrounding this topic investigates a number of different types of interventions that reduce prejudice. Educational interventions involve giving participants scientific information about the lives of transgender individuals to increase the former's awareness of transgender lives and decrease transphobia (Chan et al., 2009). One study aimed to measure the efficacy of an educational webinar training by subjecting participants to three awareness trainings: an anti-stigma training, a panel training, and a webinar, each of which provided educational information about transgender lives such as the effect of transphobia on transgender lives and the different forms of gender affirmation (Mizock et al., 2017). Participants' transphobic attitudes were tested before and after the training. Although all the training showed a reduction in transphobia, the webinar proved to be an especially valuable tool for spreading awareness because of the flexibility it offered being internet-based. This finding is consistent with previous literature which suggested webinar training, in general, was more effective in disseminating information than other forms of educational training (Mizock et al., 2017). Furthermore, another study focusing on healthcare workers also suggested that educational

training increased awareness about the needs of transgender individuals and led to better healthcare for the transgender community (McDowell et al., 2020).

Although educational training is effective at reducing transphobia, they tend to focus mainly on the scientific explanation of transgender lives, highlighting the biological and definitional framework of being transgender. These trainings fail to include the valuable layer of humanizing transgender individuals by showing the lived experiences of transgender folk and inciting empathy. In order to humanize transgender individuals, researchers thought to broaden transgender awareness beyond just the biological explanation by sharing information about personal transgender experiences. Sharing these experiences is meant to not only educate people about transgender lives but to also incite empathy, which can reduce bias (Whitford & Emerson, 2019). Empathy is the act of understanding another person's thoughts and feelings. Previous literature indicates that empathy has played a significant role in decreasing prejudice against the Lesbian, Gay, and Bisexual community provoking participants to imagine what other people's lives may be like (Hodson et al., 2009). Past studies looked at how prejudice reduction affected a specific marginalized community and ran studies to see if the same effect would occur in a separate minority community. Thus, researchers saw how empathy affected prejudice against the LGB community and hypothesized that it could have that desired effect on the transgender community.

Intergroup contact theory has been used to humanize transgender folk and incite empathy. Intergroup contact theory states that, under the right conditions, the interaction of one group with another can lead to more positive attitudes between the two groups (Allport, 1954). Participants in one study on intergroup contact were randomly assigned into two groups: one which received a panel presentation by a transgender person followed by a lecture presentation two days later, and another which received the same presentations but in reverse order (Walch et al., 2012). The group who received the transgender panel presentation first showed less stigma against transgender individuals compared to those who received the lecture first. Thus, it can be inferred, experiencing humanizing contact with a transgender person before learning more factual information about them primes participants to respond more positively to learning informa-

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

tion about transgender individuals. This study showed that although brief, meaningful contact with the transgender presenter resulted in more stigma reduction that lasted for a prolonged period in comparison to the other condition. Although contact can reduce transphobia, it puts a lot of pressure, burden, and responsibility on transgender folk, and it may not be logistically feasible. To address these concerns, a follow-up study explored whether imagined intergroup contact can have the same effect as actual intergroup contact (Moss-Racusin & Rabasco, 2017). Participants either engaged in imagined intergroup contact with a cisgender person or with a transgender person and were then asked to rate how they felt about these people and whether transgender folk were likable and hireable. Imagined intergroup contact reduced transphobia and eliminated the difference previously present around hireability and likeability between cisgender and transgender persons. In other words, imagined intergroup contact was an efficacious intervention to decrease transphobia. Inspired by this work, the effect of virtual contact with transgender individuals has also been studied (Boccanfuso et al., 2020). In this follow-up, participants were randomly assigned into two groups that had virtual contact through a text-chat program with someone who either told them that she was a cisgender woman or that she was a transgender woman. Participants were then asked to respond to a questionnaire that assessed transgender stigma. Results showed that this intervention successfully reduced transphobia in cisgender men but not in cisgender women. The reason behind this effect is the fact that cisgender men typically have more prejudice towards transgender individuals. Contact with transgender folk more heavily affects “prejudice-prone populations” and can alter their prejudice the most (Hodson, 2011).

The aforementioned literature focused on studying the efficacy of education and contact interventions alone as opposed to comparing them to one another and testing their efficacy. Case & Stewart (2013) intended to fill in some of the gaps in the literature by designing a study made of three experimental interventions and comparing their efficacy. Participants were recruited from different social science courses in a state university in Texas and assigned to one of three interventions: providing participants with a list of facts about transgenderism (educational intervention), providing participants with a letter from a transgender

adolescent to his parents (humanizing intervention), and showing participants a snippet of a documentary about transgender students in college (humanizing intervention). The documentary included the parents’ reactions to the letter. The humanizing interventions were meant to incite empathy from participants toward transgender individuals. Participants were instructed to answer a questionnaire before and after the interventions that measured their attitudes toward transgender individuals. No intervention was more effective than the other. Motivated by the comparison of humanizing and educational interventions, Tompkins and colleagues (2015) also randomly assigned participants to experience either a humanizing or educational intervention. The humanizing condition showed participants that transgender folk are actual people with lives and incited empathy towards their struggles by having them watch a documentary about a transgender child who was supported by her parents in her transition. In the education condition, participants read about the diagnostic criteria for Gender Identity Disorder and then watched an interview with an expert who explained the process of transitioning and provided factual information about transgender individuals devoid of emotions. After participating in one of these two interventions, the participants completed self-report measures of feelings and attitudes towards transgender individuals. Participants in the humanizing condition endorsed less transphobic attitudes than those in the education condition. This finding suggests that humanizing interventions may be most effective at reducing transphobia among participants (Tompkins et al., 2015).

The Present Study

Although past research has compared the efficacy of different interventions designed to reduce transphobia, it has not employed strong control conditions. The current study focused on a humanizing intervention, as some research suggests they are more successful at reducing transphobia than education interventions (Tompkins et al., 2015). Specifically, the current study was encouraged to use one of the humanizing interventions from Case and Stewart (2013). Their letter intervention involved participants reading a letter written by an adolescent who came out to his parents as a transgender man. The letter’s goal was to invoke a sense of empathy within participants when they completed a transphobia questionnaire and the

results of this group were compared to the results of other types of interventions. Both this study and others (e.g. Case & Stewart, 2013; Tompkins et al., 2015; Mizock et al., 2017) lacked independent control conditions that could have provided them with a baseline and would have strengthened their ability to assess the efficacy of the interventions. Researchers did use a pretest measure, but pretest measures can increase participants' awareness about the true purpose of the study and lead participants to artificially give less transphobic answers. While previous research was an important initial step in studying approaches to transphobia reduction, these prior studies also shared the weaknesses of having a small sample size and utilizing college student samples, who typically have a less conservative outlook on gender identity than the general population (Campbell & Horowitz, 2015). The current work seeks to extend prior research by addressing some of their potential weaknesses. Thus, this study will primarily look at the extent to which a brief empathetic intervention can decrease prejudice against transgender individuals while also reducing social desirability bias. Social desirability bias is the tendency of research participants to answer questions in a manner they assume the researchers desire (Crowne & Marlowe, 1960). This study often refers to transphobia as prejudice towards transgender individuals. The current work supplements past research by using a separate control group that was not subjected to any intervention and then completed the same questionnaire as participants in the other groups. This condition provides an independent baseline to compare with the results of the interventions. Participants in the key intervention condition were instructed to read a letter written by a young man coming out to his parents as a transgender man, which was brought about by the letter presented in Case & Stewart (2013). This intervention is meant to instigate empathy towards him and reduce transphobia. The current work also extends prior research by testing another condition, a parallel version of the transman letter condition about a young adult telling his parents that he will be dropping out of college to pursue music. This intervention intends to instill empathy in participants towards the young adult to study if empathy in general affects individuals' prejudice against transgender folk. After completing one of the three conditions, participants answered self-report measures of transphobia and a number of

other dependent variables related to prejudice and intergroup attitudes.

We expected to find a significant main effect of our manipulation such that participants in the transman letter condition would have more positive reactions across all of our dependent variables, including lower levels of transphobia and prejudice, compared to participants in the control group (Hypothesis 1). This prediction is consistent with prior research which shows that implementing a humanizing intervention (transman letter condition) that incites empathy can decrease prejudice against transgender individuals (Tompkins et al., 2015). Additionally, we explored whether participants in the musician letter condition would differ from participants in the control and transman letter conditions. This letter about a young man dropping out of college to be a musician was meant to incite empathy from the participants toward his difficult situation. This condition enabled the current study to look at whether transphobia can be decreased solely by enticing empathy generally, as opposed to empathy about trans lives specifically. Previous literature shows that humanizing interventions are able to reduce prejudice towards minority groups such as people from different racial groups, people with mental illness, and people in the LGB community (Whitford & Emerson, 2019). If these effects hold true for transphobia, then participants in the musician letter condition may have less negative opinions towards transgender folk versus the control condition. However, since the empathy produced from the musician letter condition is not inspired by the vulnerability of the transgender man's experience, it was predicted to have less of an impact on transphobia compared to the transman letter condition (Hypothesis 2).

Although the current work focuses on the effect of our manipulation, this study also explored the role of participant gender. This study explored whether cisgender men would generally have more negative responses across dependent variables, including higher levels of transphobia, compared to women (Hypothesis 3). Men tend to hold more power in society compared to other gender identities, benefit from maintaining the status quo, and therefore feel more threatened by non-normative experiences (West & Borrás-Guevara, 2021). Indeed, previous research has shown that men have more negative attitudes toward transgender individuals than women (Tebbe & Mora-

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

di, 2012; Tompkins et al., 2015). This study also explored whether our manipulation would interact with participant gender (Hypothesis 4).

Methods

Participants

This study was conducted through Amazon's Mechanical Turk (MTurk) which is a website used by researchers to recruit and compensate participants for a variety of kinds of tasks including psychological studies (Buhrmester, Kwang, & Gosling, 2011). Three hundred and two participants were recruited from the United States only and completed the study. They were compensated \$2.50 for their participation. We ran an a priori power analysis using G*Power to determine sample size (Faul, Erdfelder, Buchner & Lang, 2009). Given our design, we set alpha to .05 and assumed a small effect size of partial eta squared .035. The analysis indicated that 270 participants would provide us with 80% power. We decided to run up to 300 participants in case we needed to exclude any participants, and due to an MTurk glitch, 302 participants responded.

195 participants indicated that they identify as female, 98 identified as male, 2 identified as transgender men, and 3 identified as non-binary individuals. The remaining 4 either chose not to respond or added a category of their own. As our analyses required roughly equal groups of participant gender, we only had the statistical power to analyze cisgender male and cisgender female participants ($N = 293$). The participants' average age was 35.53 years old ($SD = 12.04$). The majority (70.9%) of participants identified as White/Caucasian, 13.6% identified as African American, 7.5% identified as Asian/Pacific Islander, and 6.4% identified as Hispanic. The rest of the participants indicated they identified with another racial category or selected multiple identifications (for more information about demographics see Table 1 and Table 2).

Design

The study used a 3-letter condition (no letter group vs. musician letter group vs. transgender letter group) x 2 participant gender (male participants vs. female participants) between-subjects design.

Procedure and Manipulation

The study was conducted using the web survey software, Qualtrics. Participants were asked to complete a survey called "Other People's Stories." They were then randomly assigned to one of three groups:

one with no letter, one instructed to read a letter about an individual coming out to his parents as a transgender man, and one with a letter about a student who is telling his parents he wants to drop out of college to pursue music. The transgender letter was taken from Case & Stewart (2013); originally, the letter was found in "True Selves: Understanding Transsexuality" (Brown & Rounsley, 1996). This book includes real-life experiences of transgender people to provide insight into their families and help them better understand the hardships that transgender people go through. This is a real letter from a transgender man coming out to his parents. For this study, the letter was slightly edited: due to ethical concerns, parts that mentioned suicide/suicidal ideation were removed so as to not expose the participants to such topics. The musician's letter was based largely on the transgender letter. It was created to make sure there was a group of participants who were exposed to a letter simulation that did not involve transgender experiences. The musician and transgender letters were intended to be as parallel as possible, but with the musician's letter involving a child disclosing something difficult to their parents unrelated to gender. An example of the difference between these two letters can be seen here: in the musician's letter the following was said "For the longest time, I had been deeply unhappy with my major- the life plan I am supposed to want," whereas the transgender letter said, "For the longest time, I had been deeply unhappy with the body I am in- the body I am supposed to feel comfortable in." See Appendices A and B for the complete letters.

After reading the transgender letter, musician letter, or no letter, the participants were all instructed to answer the same series of questions. The questionnaire included variables detailed in the dependent measures section below, as well as filler questions such as the big five personality measure (Morizot, 2014). All scales included a prefer not to respond option. Finally, participants were debriefed regarding the true purpose of the study, which was to understand the effect of empathy on prejudice against transgender individuals. Participants were asked to re-consent given this information and offered the opportunity to have their data discarded. All participants re-consented and allowed for the use of their data.

Dependent Measures

Transphobia. Participants were asked to respond to nine questions regarding their attitudes towards gen-

der-diverse and transgender individuals on a scale from 1 (strongly disagree) to 7 (strongly agree) (Nagoshi et al., 2008). An example question is “I believe that a person can never change their gender” ($\alpha=.93$).

Attitudes Towards Transgender Individuals. Participants were asked to respond to 20 questions measuring the way people feel about transgender individuals on a scale of 1 (strongly disagree) to 5 (strongly agree) (Walch et al., 2012). An example question is “I avoid transgender individuals whenever possible” ($\alpha=.97$).

Feelings Thermometer. Participants completed an adapted version of the Feelings Thermometer (Murphy et al., 2011) which asked them to rate how warm they felt towards groups on a scale of 0 to 100 (0 being not warm at all and 100 being completely warm). The groups they were asked to rate their feelings towards were transgender men, transgender women, and non-binary individuals ($\alpha=.98$).

Inclusion of Other in Self. Participants completed an adapted version of the Inclusion of Other in the Self Scale (Aron et al., 1992). Participants were presented with seven sets of increasingly overlapping circles, one labeled ‘self’ and the second labeled “other.” These sets of circles began with no overlap and got progressively more overlapping. Participants were asked to choose the circle that best represents their relationship with a group, with “self” being themselves and “other” representing: transgender men, transgender women, and non-binary individuals. They were asked to do so three times for the three different groups ($\alpha=.95$).

Exploratory Dependent Measures

Interpersonal Reactivity Index (IRI). Participants were asked to respond to 16 questions measuring levels of empathy on a scale from 1 (does not describe me well) to 5 (describes me very well) (Davis, 1980) ($\alpha=.81$). This scale is made up of four different subscales, each comprised of four items. Example questions of the four subscales perspective taking, fantasy, empathetic concern, and personal distress respectively are: “I try to look at everybody’s side of a disagreement before I make a decision” ($\alpha=.81$). “I really get involved with the feelings of the characters in a novel” ($\alpha=.84$). “I often have tender, concerned feelings for people less fortunate than me” ($\alpha=.77$). “In emergency situations, I feel apprehensive and ill-at-ease” ($\alpha=.78$).

Privilege and Oppression Inventory (POI). This scale was included as an exploratory measure to observe the effect that the intervention had on partici-

pants’ perception of their social power and other people’s marginalization within society. Participants were asked to respond to 22 questions regarding their awareness of privilege and oppression in society on a scale from 1 (strongly disagree) to 6 (strongly agree) (Hays et al., 2007). An example question is “Being White and having an advantage go hand in hand” ($\alpha=.97$).

Ambivalent Sexism Inventory. This scale was included in order to observe whether the intervention could impact participants’ levels of ambivalent sexism. Ambivalent sexism is made up of two sub-groups: benevolent sexism and hostile sexism. Benevolent sexism is characterized by seemingly positive comments that are actually damaging to a person. Hostile sexism is characterized by blunt and negative comments that adhere to harmful gender stereotypes. Participants were asked to respond to 22 statements concerning their views on men and women within society on a scale of 1 (disagree strongly) to 6 (agree strongly) (Glick & Fiske, 1996) ($\alpha=.88$). This scale is divided into two subscales each comprised of eleven items. An example of the first subscale, benevolent sexism, is “In a disaster, women ought not necessarily to be rescued before men” ($\alpha=.84$). An example of the second subscale, hostile sexism, is “Women are too easily offended” ($\alpha=.83$).

System Justification. This scale was added to observe the effect of the intervention on how fair participants believe social systems are and whether or not they support the current social system. Participants were asked to respond to 8 items measuring how fair participants feel that social systems are on a scale of 1 (strongly disagree) to 9 (strongly agree) (Kay & Jost, 2003). An example item is “In general, you find society to be fair” ($\alpha=.86$).

Need for Closure. This scale was added as an exploratory measure of how this intervention could impact participants’ need for certainty and order and measure participants’ ability to accept uncertainty. Participants were asked to respond to 15 questions regarding their need for certainty and how much they value order on a scale from 1 (strongly disagree) to 6 (strongly agree) (Neuberg et al., 1997). An example question is “I don’t like to be with people who are capable of unexpected actions” ($\alpha=.87$).

Reactions to Coming Out. Participants were asked to rate the degree to which they *should respond* with five different reactions parents could have to their son coming out to them on a scale of 1 (strongly disagree) to 7 (strongly agree). The potential reactions to coming

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

out were based on data from an article that reported first-person reports of parents dealing with their kids coming out as transgender (Wren, 2002). An example item is: "Take Adam to see a specialist and change his mind" ($\alpha=.75$). Using the same scale, participants were then asked to respond to the same five reactions, except this time, they were asked to imagine how they *would respond* if they were in the shoes of those parents. An example item is "Get the proper professional help to support Adam and his decisions" ($\alpha=.76$).

Manipulation Checks and Demographics

Participants were asked four questions and all items had a "Prefer not to respond" option. The first manipulation check asked participants "Did you read a letter at the beginning of this study" with answer options: "Yes", and "No." The second manipulation check asked participants: "If yes, what was this letter about?" and had answer options: "Someone telling their parents that they are actually a man and will be going through a gender transition", "Someone telling their parents that they will be dropping out of college to pursue music", and "I did not read a letter." The third manipulation check asked participants: "Who wrote the letter that you read" with answers: "A transgender man (a man assigned female at birth)", "A transgender woman (a woman assigned male at birth)", "A cisgender man (a man assigned male at birth)", "A cisgender woman (a woman assigned female at birth)", "The gender of the letter was not specified", and "I did not read a letter." Finally, the fourth manipulation check asked: "If you read a letter, how did it end?" with answer options: "with love, Adam", "with love, Alice (soon to be known as Adam)", and "I did not read a letter."

Demographics. After completing the questions, participants were asked to answer a few demographic measures such as gender, age, and race.

Results

Manipulation Checks

Chi-square tests of independence were performed on each manipulation check. Participants' responses to the first manipulation check regarding whether or not they read a letter were significantly associated with the actual letter condition, $\chi^2(2, N = 292) = 211.56, p < .001$. All participants in both the transman letter condition and the musician letter condition reported that they read a letter at the beginning of the study. 80.00% of participants in the control condition re-

ported that they did not read a letter at the beginning of the study. This could be due to the fact that early in the study participants were told that other participants would be reading a letter. Thus, participants were instructed to answer the questionnaire knowing that other participants have read a letter.

Participants' responses to the second manipulation check that asked them what the letter was about were significantly associated with the actual letter condition, $\chi^2(4, N = 292) = 471.76, p < .001$. 98.9% of participants in the transman letter condition correctly reported that they read a letter about a transman coming out to his parents. 99.01% of participants in the musician condition correctly reported that they read a letter about an aspiring musician. 81.00% of participants in the control condition correctly reported that they had not read a letter.

Participants' responses to the third manipulation check that asked them about the gender identity of the person writing the letter were significantly associated with the actual letter condition, $\chi^2(10, N = 290) = 470.51, p < .001$. 87.91% of the participants in the transman letter condition reported that the person writing the letter was a transgender man. 98.02% of participants in the musician letter condition reported that the person writing the letter was either a cis-gender man or they indicated that the gender identity was not disclosed. Both of these options were considered to be correct because the letter's author used a name that is stereotypically male and did not specify their gender identity explicitly. 81.63% of the participants in the control condition indicated that they did not read a letter.

Participants' responses to the fourth manipulation check that asked them how the letter ended were significantly associated with the actual letter condition, $\chi^2(4, N = 290) = 445.00, p < .001$. 91.3% of the participants in the transman letter condition reported that the letter ended with "With love, Alice (soon to be known as Adam)." 100.00% of participants in the musician letter correctly reported that their letter ended with "With love, Adam." Finally, 81.82% of the participants in the control condition correctly indicated that they did not read a letter.

Primary Analyses

Between-subjects 3 (letter condition: no letter group vs. musician letter group vs. transgender letter group) x 2 (participant gender: male vs. female) ANOVAs were conducted on each of our dependent varia-

bles. Follow-up Tukey tests were conducted on significant main effects of letter condition. Although our pre-registration focused primarily on the effects of letter condition only, the analysis with participant gender is reported here since consistent participant gender effects emerged, and this analysis was also outlined in the pre-registration.

Transphobia. A significant effect of participant gender emerged such that men reported greater overall transphobia ($M = 3.51, SD = 1.49$) than women ($M = 3.03, SD = 1.54$), $F(1, 287) = 6.07, p = .014, \eta_p^2 = .02$. There was no main effect of letter condition on transphobia, $F(2, 287) = 0.60, p = .549, \eta_p^2 = .00$, nor was there a significant interaction, $F(2, 287) = 1.16, p = .316, \eta_p^2 = .01$.

Attitudes Towards Transgender Individuals. There was no main effect of participant gender on attitudes towards transgender individuals, $F(1, 285) = 3.42, p = .065, \eta_p^2 = .01$. There was also no main effect of letter condition on attitudes towards transgender individuals, $F(2, 285) = 1.37, p = .256, \eta_p^2 = .01$, nor was there a significant interaction, $F(2, 285) = 1.89, p = .153, \eta_p^2 = .01$.

Feelings Thermometer. A significant effect of participant gender emerged such that women reported warmer feelings towards transgender men ($M = 70.50, SD = 31.19$) than did men ($M = 60.82, SD = 33.34$), $F(1, 287) = 5.48, p = .020, \eta_p^2 = .02$. Similarly, a significant effect of participant gender emerged such that women reported warmer feelings towards transgender women ($M = 69.49, SD = 32.27$) than did men ($M = 60.71, SD = 33.76$), $F(1, 287) = 4.38, p = .037, \eta_p^2 = .02$. There was no main effect of letter condition on feelings towards transgender men, $F(2, 287) = 0.26, p = .755, \eta_p^2 = .00$, nor towards transgender women, $F(2, 287) = 0.04, p = .964, \eta_p^2 = .00$. Additionally, nor was there a significant interaction between participant gender and letter condition when it came to transgender men, $F(2, 287) = 1.80, p = .168, \eta_p^2 = .01$ and transgender women $F(2, 287) = 1.37, p = .256, \eta_p^2 = .01$.

There was no significant effect of participant gender on feelings towards non-binary individuals, $F(1, 287) = 3.69, p = .056, \eta_p^2 = .01$. There was no main effect of letter condition on feelings towards non-binary individuals, $F(2, 287) = 0.28, p = .754, \eta_p^2 = .00$, nor was there a significant interaction, $F(2, 287) = .69, p = .503, \eta_p^2 = .01$.

Inclusion of Other in Self. There was no significant effect of participant gender on how close they felt

towards transgender men, $F(1, 279) = .08, p = .785, \eta_p^2 = .00$. There was no main effect of letter condition on feelings towards transgender men, $F(2, 279) = 0.71, p = .491, \eta_p^2 = .01$, nor was there a significant interaction, $F(2, 279) = .211, p = .810, \eta_p^2 = .00$.

There was no significant effect of participant gender on how close they felt towards transgender women, $F(1, 278) = .01, p = .925, \eta_p^2 = .00$. There was no main effect of letter condition on feelings towards transgender women, $F(2, 278) = 0.36, p = .698, \eta_p^2 = .00$, nor was there a significant interaction, $F(2, 278) = .28, p = .756, \eta_p^2 = .00$.

There was no significant effect of participant gender on how close they felt towards non-binary individuals, $F(1, 278) = .01, p = .924, \eta_p^2 = .00$. There was no main effect of letter condition on feelings towards non-binary individuals, $F(2, 278) = 0.46, p = .630, \eta_p^2 = .00$, nor was there a significant interaction, $F(2, 278) = .27, p = .767, \eta_p^2 = .00$.

Interpersonal Reactivity Index (IRI). A significant effect of participant gender emerged such that women scored higher on perspective taking ($M = 4.12, SD = 0.73$) than men ($M = 3.86, SD = 0.77$), $F(1, 286) = 7.14, p = .008, \eta_p^2 = .02$. There was no main effect of letter condition on perspective taking, $F(2, 286) = 0.52, p = .595, \eta_p^2 = .00$. However, a significant interaction between letter condition and gender emerged, $F(2, 286) = 4.35, p = .014, \eta_p^2 = .03$. Women scored higher on perspective taking ($M = 4.23, SD = 0.67$) than men ($M = 3.88, SD = 0.86$) in the control condition, $F(1, 286) = 5.04, p = .026, \eta_p^2 = .02$. Women also scored higher on perspective taking ($M = 4.22, SD = 0.73$) than men ($M = 3.70, SD = 0.70$) in the musician letter condition, $F(1, 286) = 10.90, p = .001, \eta_p^2 = .04$. However, there was no gender difference in the transman letter condition, $F(1, 286) = 0.64, p = .424, \eta_p^2 = .00$ ($M_{women} = 3.89, SD = .75; M_{men} = 4.02, SD = 0.73$) (See Figure 1). When broken down the other way, analyses show that there was no effect of letter condition among men, $F(2, 286) = 1.42, p = .244, \eta_p^2 = .01$, but there was an effect of letter condition among women, $F(2, 286) = 4.45, p = .013, \eta_p^2 = .03$. Follow-up Tukey tests indicate that women in the control condition and women in the musician letter condition scored higher on perspective taking than women in the transman letter condition ($p = .010$ and $p = .009$ respectively). There was no difference in perspective taking between women in the control and musician letter conditions,

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

$p = .980$.

A significant effect of participant gender emerged such that women scored higher on fantasy ($M = 3.86$, $SD = 0.90$) than men ($M = 3.53$, $SD = 1.04$), $F(1, 287) = 6.72$, $p = .010$, $\eta_p^2 = .02$. There was no main effect of letter condition on fantasy, $F(2, 287) = 1.08$, $p = .341$, $\eta_p^2 = .01$. However, a significant interaction between letter condition and gender emerged, $F(2, 287) = 6.45$, $p = .002$, $\eta_p^2 = .04$. Women scored higher on fantasy ($M = 3.99$, $SD = .80$) than men ($M = 3.17$, $SD = 1.18$) in the control condition, $F(1, 287) = 17.58$, $p < .001$, $\eta_p^2 = .06$. However, there was no gender difference in the musician letter condition, $F(1, 287) = 2.19$, $p = .140$, $\eta_p^2 = .01$. ($M_{women} = 3.91$, $SD = .96$; $M_{men} = 3.62$, $SD = .87$). There was also no gender difference in the transman letter condition, $F(1, 287) = .99$, $p = .319$, $\eta_p^2 = .00$ ($M_{women} = 3.65$, $SD = .91$; $M_{men} = 3.86$, $SD = 0.92$) (See Figure 2). When broken down the other way, analyses show that there was no effect of letter condition among women, $F(2, 287) = 2.30$, $p = .103$, $\eta_p^2 = .02$, but there was an effect of letter condition among men, $F(2, 287) = 4.57$, $p = .011$, $\eta_p^2 = .03$. Follow-up Tukey tests indicate that men in the transman letter condition scored higher on fantasy than men in the control condition ($p = .003$). There was no difference in fantasy between men in the control and musician letter conditions nor was there a difference between the men in the musician letter condition and the transman letter condition, ($p = .052$ and $p = .317$).

There was a significant effect of participant gender such that women scored higher on empathetic concern ($M = 4.26$, $SD = 0.70$) than men ($M = 3.91$, $SD = 0.77$), $F(1, 286) = 14.64$, $p < .001$, $\eta_p^2 = .05$. There was no main effect of letter condition on empathetic concern, $F(2, 286) = 0.02$, $p = .976$, $\eta_p^2 = .00$, nor was there a significant interaction, $F(2, 286) = .05$, $p = .951$, $\eta_p^2 = .00$.

A significant effect of participant gender was observed such that women scored higher on personal distress ($M = 2.88$, $SD = 1.01$) than men ($M = 2.52$, $SD = 0.93$), $F(1, 287) = 9.58$, $p = .002$, $\eta_p^2 = .03$. There was no main effect of letter condition on personal distress, $F(2, 287) = 0.05$, $p = .952$, $\eta_p^2 = .00$, nor was there a significant interaction, $F(2, 287) = 1.84$, $p = .160$, $\eta_p^2 = .01$. **Privilege and Oppression Inventory (POI).** A significant effect of participant gender emerged such that women reported greater awareness of privilege and oppression ($M = 4.49$, $SD = .97$) than men ($M = 4.10$, $SD = 1.16$), $F(1, 287) = 8.96$, $p = .003$, $\eta_p^2 =$

.03. There was no main effect of letter condition on awareness of privilege and oppression, $F(2, 287) = .41$, $p = .665$, $\eta_p^2 = .00$, nor was there a significant interaction, $F(2, 287) = .67$, $p = .511$, $\eta_p^2 = .01$. **Ambivalent Sexism Inventory.** There was no significant effect of participant gender on benevolent sexism, $F(1, 287) = 1.98$, $p = .161$, $\eta_p^2 = .01$. There was no main effect of letter condition on benevolent sexism, $F(2, 287) = 1.84$, $p = .161$, $\eta_p^2 = .01$. However, a significant interaction between letter condition and gender emerged, $F(2, 287) = 3.80$, $p = .023$, $\eta_p^2 = .03$. Men scored higher on benevolent sexism ($M = 3.60$, $SD = .95$) than women ($M = 3.07$, $SD = 1.09$) in the control condition, $F(1, 287) = 6.30$, $p = .013$, $\eta_p^2 = .02$. There was no gender difference in the musician letter condition, $F(1, 287) = 1.75$, $p = .187$, $\eta_p^2 = .01$ ($M_{women} = 3.35$, $SD = 1.10$; $M_{men} = 3.06$, $SD = 0.90$), nor in the transman letter condition, $F(1, 287) = 1.63$, $p = .203$, $\eta_p^2 = .01$ ($M_{women} = 3.37$, $SD = 1.00$; $M_{men} = 3.66$, $SD = 0.91$) (See figure 3). When broken down the other way, analyses show that there was no effect of letter condition among women, $F(2, 287) = 1.72$, $p = .181$, $\eta_p^2 = .01$, but there was an effect of letter condition among men, $F(2, 287) = 3.30$, $p = .038$, $\eta_p^2 = .02$. Follow-up Tukey tests indicate that men in the musician letter condition scored lower on benevolent sexism than both men in the control condition ($p = .030$) and men in the transman letter condition ($p = .023$). There was no difference between men in the control condition and the transman letter conditions, $p = .836$.

A significant effect of participant gender emerged such that men reported more hostile sexism ($M = 3.32$, $SD = .91$) than women ($M = 2.82$, $SD = .97$), $F(1, 285) = 17.75$, $p < .001$, $\eta_p^2 = .06$. There was no main effect of letter condition on hostile sexism, $F(2, 285) = .20$, $p = .822$, $\eta_p^2 = .00$, nor was there a significant interaction, $F(2, 285) = .07$, $p = .933$, $\eta_p^2 = .00$. **System Justification.** A significant effect of participant gender emerged such that men reported more support for the status quo ($M = 4.06$, $SD = 1.67$) than women ($M = 3.5$, $SD = 1.58$), $F(1, 286) = 7.86$, $p = .005$, $\eta_p^2 = .03$. There was no main effect of letter condition on system justification, $F(2, 286) = 2.72$, $p = .067$, $\eta_p^2 = .02$, nor was there a significant interaction, $F(2, 286) = 2.19$, $p = .114$, $\eta_p^2 = .02$. **Need for Closure.** A significant effect of participant gender emerged such that women reported more need for closure ($M = 4.13$, $SD = .82$) than men ($M = 3.92$, SD

= .79), $F(1, 287) = 4.12, p = .043, \eta_p^2 = .01$. There was no main effect of letter condition on the need for closure, $F(2, 287) = .72, p = .490, \eta_p^2 = .01$, nor was there a significant interaction, $F(2, 287) = .37, p = .690, \eta_p^2 = .00$. **Reactions to Coming Out.** A significant effect of participant gender emerged such that women reported more positive reactions to how parents should react to their kids coming out ($M = 5.75, SD = 1.17$) than men ($M = 5.18, SD = 1.33$), $F(1, 283) = 13.06, p < .001, \eta_p^2 = .04$. There was a significant main effect of letter condition, $F(2, 283) = 4.93, p = .008, \eta_p^2 = .03$. Follow-up Tukey tests indicate that participants in the transman letter condition reported more positive reactions to how parents should react to their kids coming out ($M = 5.77, SD = 1.43$) than participants in the control condition ($M = 5.29, SD = 1.32$) ($p = .019$). There was no difference between participants in the control condition and the musician letter condition ($M = 5.63, SD = 0.95$) nor was there a difference between participants in the transman letter condition and the musician letter condition ($p = .121$ and $p = .694$ respectively). There was no significant interaction, $F(2, 283) = 1.61, p = .201, \eta_p^2 = .01$.

A significant effect of participant gender emerged such that women reported more positive reactions to how they would react to their kids coming out ($M = 5.83, SD = 1.28$) than men ($M = 5.20, SD = 1.40$), $F(1, 283) = 13.46, p < .001, \eta_p^2 = .05$. There was no main effect of letter condition, $F(2, 283) = 2.22, p = .111, \eta_p^2 = .02$. However, a significant interaction between letter condition and gender emerged, $F(2, 283) = 3.09, p = .047, \eta_p^2 = .02$. Women scored higher on positive reactions to how they would react to coming out ($M = 5.85, SD = 1.20$) than men ($M = 4.72, SD = 1.46$) in the control condition, $F(1, 283) = 16.55, p < .001, \eta_p^2 = .06$. However, there was no gender difference in the musician letter condition, $F(1, 283) = 3.66, p = .057, \eta_p^2 = .01$ ($M_{women} = 5.92, SD = .95; M_{men} = 5.38, SD = 1.22$). There was also no gender difference in the transman letter condition, $F(1, 283) = .22, p = .641, \eta_p^2 = .00$ ($M_{women} = 5.70, SD = 1.65; M_{men} = 5.57, SD = 1.39$) (See Figure 4). When broken down the other way, analyses show that there was no effect of letter condition among women, $F(2, 283) = .45, p = .638, \eta_p^2 = .00$, but there was an effect of letter condition among men, $F(2, 283) = 3.85, p = .022, \eta_p^2 = .03$. Follow-up Tukey tests indicate that men in the transman letter condition and men in the musician letter condition

scored higher on positive reactions than men in the control condition ($p = .010$ and $p = .039$ respectively). There was no difference between men in the transman and musician letter conditions, $p = .582$.

Discussion

The current study extends past research by further testing how efficacious a brief humanizing intervention is in reducing transphobia. In contrast to our hypothesis, we did not see a main effect of our manipulation on most of our dependent variables. The only dependent variable that was significantly affected by our manipulation was how participants reported parents should respond to their children coming out as transgender. Specifically, participants in the transman letter condition reported more positive responses on how parents should react to their child coming out than participants in the control condition. This positive influence could be caused by the explicitness of the transman letter condition in describing a transgender man's journey of self-discovery and the importance of having his parents support him. In turn, this could have motivated participants to acknowledge the ideal way in which a parent should react to their kid coming out. However, this manipulation may have not shifted participants' intrinsic beliefs about how they should act if their own child came out to them (Reiss, 2012). Additionally, the effectiveness of the manipulation may have not been extended to the other dependent variables because they were numerous. Although the questionnaire did include some filler questions, there was an abundance of transphobia questions which may have signaled to participants the true purpose of this study, thus leading to relatively low transphobia regardless of condition. Future research could decrease the number of prejudice-related items and add more filler questions which would lessen the likelihood of the participants figuring out the true purpose of the study.

Our exploratory hypothesis which expected differences between the musician letter condition and both the control condition and the transman letter condition was not supported. The musician's letter did not explicitly mention transgender issues in any way. Although it did highlight a difficult time that the character was going through, it did not describe the specific hardships that transgender individuals face when coming out to their parents. This piece could have been integral to triggering empathy towards transgender indi-

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

viduals. Thus, in this case, general empathy did not instigate a decrease in transphobia. In turn, the musician letter condition did not show the decrease in transphobic attitudes that was hypothesized to occur in comparison to the control condition.

As expected, men exhibited higher levels of transphobia, hostile sexism, and system justification than women. In addition, women exhibited higher awareness of privilege and oppression and more need for closure in comparison to men. Women also scored higher than men on all facets of the Interpersonal Reactivity Index including perspective-taking, fantasy, empathy, and personal distress. Women had warmer feelings towards transgender men and transgender women than men. In contrast to men, women reported more positive reactions to how parents should react to their kid coming out as well as how they would react to their kid coming out. These results are in alignment with our hypothesis and previous literature (Tompkins et al., 2015; Tebbe & Moradi, 2012; Glick & Fiske, 1996) that men would have more negative responses across all dependent variables than women. These findings are consistent with the fact that men tend to hold more power in society compared to other gender identities, benefit from maintaining the status quo, and therefore feel more threatened by non-normative experiences (West & Borrás-Guevara, 2021). However, there was no gender difference between men and women when it came to feelings towards non-binary individuals, attitudes towards transgender individuals, and inclusion of others in self. The lack of difference in feelings towards non-binary individuals might be due to a lack of awareness, interaction, and knowledge about non-binary folk (Fiani & Serpe, 2020). Additionally, participants may have had a difficult time with answering the inclusion of others in the self scale as it asks them to rate how close they are to transgender individuals without clarifying what closeness refers to. Participants could have thought that this question asked them to signify how close they feel to the transgender identity, or how closely they feel towards transgender people. The attitudes towards transgender individuals scale might have not triggered a gender difference because it was the second scale measuring transphobia within the survey. Thus, perhaps some participants were made aware of the true purpose behind the study, making them concerned about social desirability.

No interaction between participant gender and

letter condition was obtained on transphobia, attitudes towards transgender individuals, feelings towards transgender individuals, inclusion of self, empathetic concern and personal distress, hostile sexism, system justification, need for closure, or how parents should react to their kid coming out. In contrast, a significant interaction between participant gender and letter condition emerged on the perspective-taking subscale of the IRI which measures the tendency to imagine oneself in another person's situation and see things from their perspective. Women reported higher perspective-taking than men in both the control condition and the musician letter condition but not in the transman letter condition. This suggests that the transman letter condition affected perspective-taking such that it eliminated the standard gender differences obtained in the control condition and the musician letter condition. The transman letter condition explicitly explains how difficult it had been for the transgender man to go through life without being seen as a man. Male participants may have related to that feeling which encouraged them to put themselves in another person's shoes. Furthermore, there was a significant interaction on the fantasy subscale of the IRI which measures people's tendency to imagine themselves in fictional situations. Women scored higher than men in the control condition but there was no difference in the other two conditions. This finding suggests that both the musician and transman letter conditions are able to affect the gendered differences between men and women and their ability to imagine themselves in a situation they would usually not be in. The vulnerability present in both these letters may have encouraged men to step into a fictional situation. In addition, an interaction between participant gender and letter condition emerged on how participants would react to their kids coming out. Women reported more positive reactions in the control condition than men, but there was no gender difference in the other two conditions. This finding again suggests that the musician letter and the transman letter conditions eliminate the gender differences obtained in the control condition. Both the musician and transman letters showcased vulnerable experiences which may have influenced participants to take into consideration the characters' hardships and eliminated typically seen gender differences in would reactions to coming out. A similar interaction was also obtained on benevolent sexism, which is a subtler form

of sexism expressed in a seemingly positive light, there is an interaction between gender and letter condition. Men scored higher on benevolent sexism in the control condition than women but there was no gender difference in the musician letter condition and the transgender letter condition. The results suggest that the levels of benevolent sexism decrease in men when subjected to reading a letter. Both letter conditions highlighted the vulnerability of two young men during a hard time in their lives which could have consequently decreased men's benevolent sexism scores. Since both letters showcased the struggle of two men, they may have led male participants to be less likely to endorse traditional gendered beliefs that are seemingly positive towards women (Manzi, 2019).

Overall, the current work has a number of strengths. Firstly, it is important to test the efficacy of brief humanizing interventions with the presence of an independent control condition. The control condition acts as a reference to the other two conditions and is essential to get an understanding of the true effect of interventions like reading a coming-out letter on transphobia outside of studies with set pre- and post-tests. Previous literature (Tompkins et al., 2015; Case & Stewart, 2013; Mizock et al., 2017), uses pre-tests that tells participants something about the purpose of the study and increases social desirability bias. This study did not have a pretest condition, thus reducing the likelihood that participants are aware of the purpose of the study before experiencing the manipulation, and thus motivated to answer questions in a particular manner that is desirable to researchers. Moreover, an appropriately large sample size ($N=302$) was determined by running a priori power analysis and recruitment. This study was able to obtain a larger and more diverse sample than prior research by using MTurk recruitment. In comparison to previous studies (Walch et al., 2012; Tompkins et al., 2015), which utilized students as their participants, our participants had more varied life experiences. The mean age of our participants was approximately 35 and 37.1% of our participants had completed some level of college, 30.8% had various educational levels, and 14.9% had a Master's degree. Our sample reported relatively moderate political views ranging from conservative (26.2%) to moderate (37.8%) to liberal (56%). Previous literature used undergraduate samples (Tompkins et al., 2015; Case & Stewart, 2013; Walch et al., 2012), which

typically skew more liberal politically (Campbell & Horowitz, 2015). Thus, this study offers a more politically diverse participant sample. Another strength of our current work was our manipulation check data, which showed that participants were generally attentive and understood their respective letter conditions.

Although the current study had a number of important strengths, there are also weaknesses that can be addressed in future research. The current sample was not racially diverse. 65.2% of our participants identified as White/Caucasian. Previous research (Case & Stewart, 2013) has demonstrated higher rates of transphobia in people of color prior to interventions. Thus, future research may explore the interaction of racial identity with humanizing interventions intended to reduce transphobia. Future studies may find that humanizing interventions have a greater effect on people of color who previously had higher rates of transphobia. Cisgender men have previously had higher levels of transphobia than cisgender women. Humanizing interventions were able to eliminate some of the gendered differences between them (Hodson, 2011). Thus, a similar effect may occur with participant race. Also, the vast majority (97.1%) of our participants identified as either men or women; there were few non-cisgender and non-binary participants. Further research may attempt to recruit a more gender-diverse participant population and study potential internalized transphobia. Internalized transphobia is when transgender individuals internalize the negative outlook and normative gender attitudes that society has put in place (Scandurra et al., 2018). Future research could look into the effect of humanizing interventions on internalized transphobia and whether empathy can decrease internalized transphobia. Transgender individuals might empathize with the representations in humanizing interventions and see that their own struggles are valid. This empathy might extend to themselves thus decreasing their internalized transphobia. Additionally, future studies could explore the efficacy of a humanizing intervention by comparing the effect of letters written by people of different gender identities: transgender women, transgender men, and non-binary individuals. Participants may have different preconceived biases towards people with these gender identities and the humanizing intervention could affect participants differently depending on what condition they are exposed to. Although there

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

is not much research on whether attitudes towards transmen, transwomen, and gender non-binary people differ, there is good reason to expect their lived experiences to be different, as transgender women have been subjected to higher rates of gender-based violence (Gyamerah et al., 2021). Additionally, people have less awareness of non-binary individuals (Fiani & Serpe, 2020) which could increase people's transphobia. People are generally wary of the concepts and things that they do not know (Carleton, 2016) which in turn may affect people's attitudes towards non-binary individuals. Humanizing interventions that would include these gender identities might elicit greater reductions in transphobia levels towards transgender women versus transgender men and non-binary individuals because of the high rates of violence towards them. Moreover, future research could decrease the number of dependent variables within the study and add more filler questions in order to decrease potential social desirability bias. It would also be beneficial to also look at how long the effects of a humanizing intervention last through a longitudinal study. Brief humanizing interventions might have a temporary effect on people's prejudice towards transgender individuals, especially if the intervention was only administered once.

In sum, this brief humanizing intervention did not have the direct impacts on transphobia that were initially predicted. Unlike prior research which found more support for the effectiveness of brief humanizing interventions, this study included the general population instead of university students. Additionally, this study reduced participant suspicion by implementing a control condition. Thus, our findings suggest that prior research may have painted a rosier picture of the ease with which humanizing interventions can reduce transphobia. However, our findings still suggest that humanizing interventions may have promising effects. For example, we found that our manipulation influenced participants' outlook on how they think parents should react to their kid coming out to them, signifying that participants believed parents should react in less transphobic ways to their kid coming out. Thus, future research using humanizing interventions is needed to better understand the extent to which they can be effective in reducing transphobia and improving the livelihoods of transgender individuals.

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TOUMA SAWAYA & McCARTY

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INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

Table 1

Demographics of Participants

	Percentage
Gender	
Cisgender Male	32.5
Cisgender Female	64.6
Transgender Male	0.7
Transgender Female	0.0
Gender Non-Binary	1.0
Other	0.3
Age	
	$M=35.53; SD= 12.04$
Race/Ethnicity	
White/Caucasian	70.9
African American	13.6
Asian/Pacific Islander	7.5
Hispanic	6.4
Native American/Native Alaskan	0.3
Other	0.3
Sexual Orientation	
Asexual	1.7
Bisexual	12.3
Heterosexual	74.4

TOUMA SAWAYA & McCARTY

	Other	0.7
<hr/>		
Political affiliation		
	Republican	22.5
	Independent	30.0
	Democrat	39.2
	Other	6.5
<hr/>		
Education Level		
	Some High School	1.0
	High School/GED	12.6
	Some College	37.2
	Bachelor's Degree	31.1
	Master's Degree	14.7
	Advanced Graduate work or Ph.D.	3.4
<hr/>		

INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

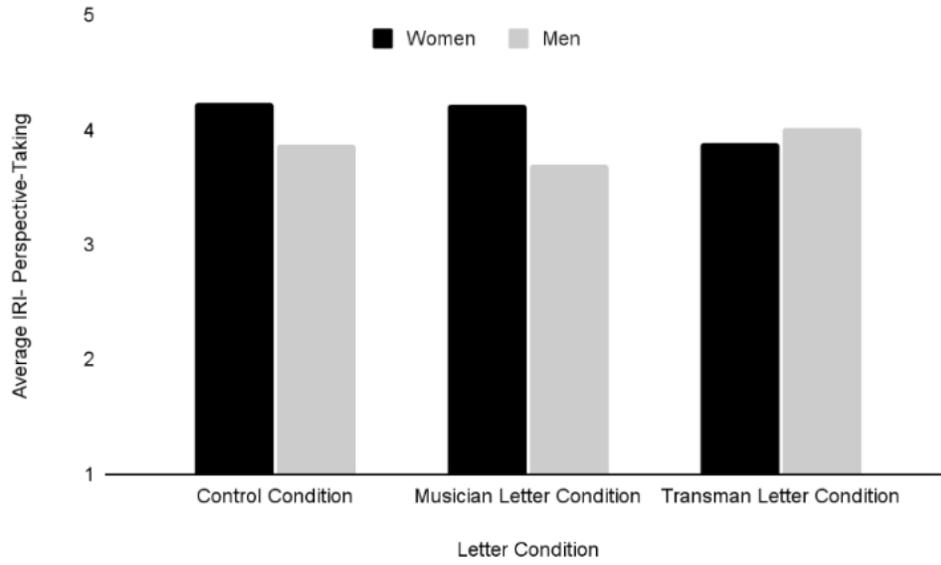
Table 2

The Distribution of Male and Female Participants in Each Condition

Condition	Number of participants	Male Percent	Female Percent
Control Condition	101	36.7	33.3
Musician Letter Condition	101	32.7	35.4
Transman Letter Condition	91	30.6	31.3

Figure 1

The Effect of Gender and Letter Condition on IRI-Perspective-Taking



INTERVENTION ON PREJUDICE TOWARDS TRANSGENDER INDIVIDUALS

Figure 2

The Effect of Gender and Letter Condition on IRI-Fantasy

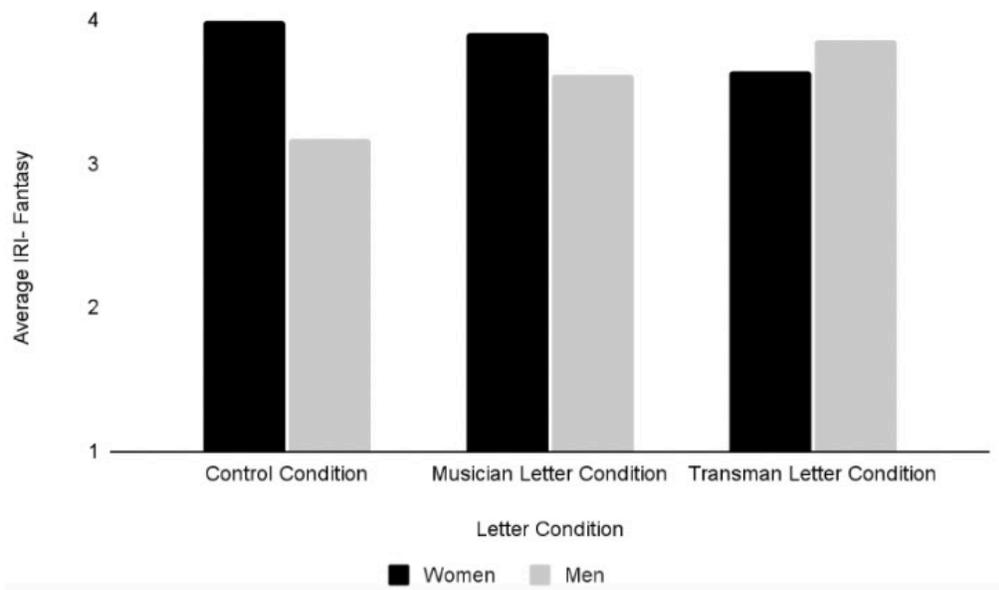


Figure 3

The Effect of Gender and Letter Condition on Ambivalent Sexism

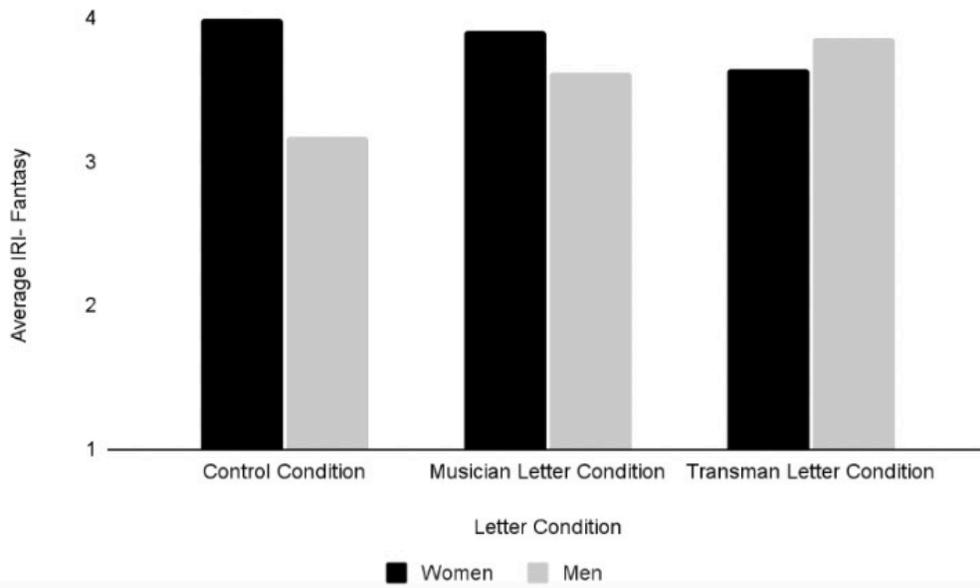
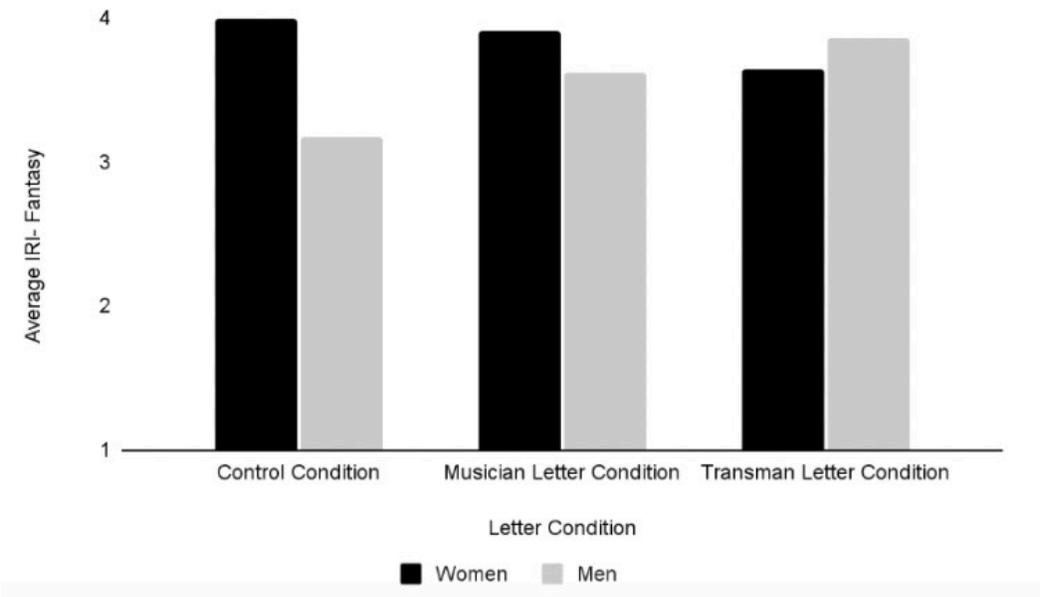


Figure 4
The Effect of Gender and Letter Condition on Would Reactions



Appendix A

Musician Letter

Dear Mom and Dad,

I have something very important to tell you about myself. You might not approve of it, but please try to keep an open mind as I try to explain this. Also, please understand that what I'm about to tell you is not your fault. So whatever you do, please don't blame yourselves.

I know you've wondered why I've never had a girlfriend. You might have noticed that I spend most of my time with my "buddies." Well, I'm not slacking off, but I have actually been in a band. You see, my current major doesn't match the way I see myself. Mom and Dad, I feel that I am a musician. You might not see this for me, but I know I am a musician. It's what comes naturally to me. I have felt this way for as long as I can remember. I know you thought I was just messing around with my guitar, but it went much deeper than that.

At the age of four, I remember thinking that I was a rockstar. Then, I learned that musicians make music for a living. So I waited for the opportunity to pursue music. Obviously, it never came. So every night, I asked God to please let me become a musician. It hasn't happened yet.

Up until age twelve, things were just OK. I had some really good times with my buddies, but I was very sad and lonely knowing that I would soon have to give this all up to go to college. Then in high school, things got a lot worse. There were so many things I wanted to do but couldn't. There were band practices that I had to miss, but I had to keep my feelings locked up inside. I always had to pretend to be someone I wasn't. I couldn't just be myself. You have no idea how hard it was for me to try to act like I wanted to become a doctor. It was extremely difficult for me! To this day, it really tears me up inside! For the longest time, I had been deeply unhappy with my major- the life plan I am supposed to want. But no matter what I did or how hard I worked, I could never feel passionate about medicine. At one time, I felt so unhappy that I had to call an emergency hotline because I didn't know what else to do.

Every day is a struggle for me because I know I have to play a role I'm not comfortable in. It stresses me out so much! I'm sick and tired of the whole charade! At school, I present a cheerful image. So they expect me to be all dedicated to my academic journey and happy. They're used to seeing me with a smile on my face all the time. If only they knew the pain and torture I'm going through!

Well, Mom and Dad, what I'm trying to say is that I am going to quit college and start my music career. Now, you don't have to understand me, but please try to accept me. I can't be who you want me to be. I've got to do what I know is right for me—not what anyone else might think is right. Your support during this chapter of my life would mean the world to me.

Mom and Dad, you've been so good to me. I just want to thank you for all you've done for me. I feel truly blessed to have parents like you. I love you. Please don't ever forget that, no matter what.

With love,
Adam

Appendix B

Transgender Letter

Edited from Case, K. A., Stewart, B. (2013)

Dear Mom and Dad,

I have something very important to tell you about myself. You might not approve of it, but please try to keep an open mind as I try to explain this. Also, please understand that what I'm about to tell you is not your fault. So whatever you do, please don't blame yourselves.

I know you've wondered why I never had a boyfriend. You might have noticed that all of my guy friends are more like my "buddies." Well, I'm not a lesbian, but I am very much attracted to women. You see, my body doesn't match the way I see myself. Mom and Dad, I feel that I am a man. My body might tell you the opposite, but I know I am a man. It's what comes naturally to me. I have felt this way for as long as I can remember. I know you thought I was just a tomboy, but it went much deeper than that.

At the age of four, I remember thinking that I was a boy. Then I learned that boys have a penis. So I waited for mine to grow. Obviously, it never did. So every night, I asked God to please change my body into a male body. It hasn't happened yet.

Up until age twelve, things were just OK. I had some really good times with my buddies, but I was still very sad and lonely. Then in high school, things got a lot worse. There were so many things I wanted to do but couldn't. There were girls that I really liked and cared about, but I had to keep my feelings locked up deep inside. I always had to pretend to be someone I wasn't. I couldn't just be myself. You have no idea how hard it was for me to try to act like a girl. It was extremely humiliating for me! To this day, it really tears me up inside! For the longest time, I had been deeply unhappy with the body I am in- the body I am supposed to feel comfortable in. But no matter what I did or how hard I worked out, I could never feel at home in my own skin. At one time, I felt so unhappy that I had to call an emergency hotline because I didn't know what else to do.

Every day is a struggle for me because I know I have to play a role I'm not comfortable in. It stresses me out so much! I'm sick and tired of the whole charade! At work, I present a cheerful image. So they expect me to be all feminine and happy. They're used to seeing me with a smile on my face all the time. If only they knew the pain and torture I'm going through!

Well, Mom and Dad, what I'm trying to say is that I am going to begin my gender transition into the body that I truly feel comfortable in. Now, you don't have to understand me, but please try to accept me. I can't be who you want me to be. I've got to do what I know is right for me—not what anyone else might think is right. Your support during this chapter of my life would mean the world to me.

Mom and Dad, you've been so good to me. I just want to thank you for all you've done for me. I feel truly blessed to have parents like you. I love you. Please don't ever forget that, no matter what.

With love,

Alice (soon to be known as Adam)

Appendix C

**Reactions to Coming Out
(Using data from Wren, 2002)**

Rate the following statements according to your degree of agreement or disagreement using a 7-point scale ranging from 1= strongly disagree to 7 strongly agree

Adam's parents should...

- Support Adam completely- even if they do not understand him
- Tell Adam that he is not mature enough to make such major decisions
- Take Adam to see a specialist and change his mind
- Get the proper professional help to support Adam and his decisions
- Accept Adam

If you were Adam's parent, you would...

- Support Adam completely- even if you do not understand him
- Tell Adam that he is not mature enough to make such major decisions
- Take Adam to see a specialist and change his mind
- Get the proper professional help to support Adam and his decisions
- Accept Adam

Understanding Migration and Resettlement Experiences of Uzbek Immigrants in the United States

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This qualitative study utilized a thematic six-step analysis process of interview data to identify prominent themes in the life experiences of 20 Uzbek immigrants regarding their migration to and resettlement in the United States; it also examined gender differences in their experiences. The results indicated that at the time of migration, most Uzbek participants were well-educated, middle class, and in their mid-20s. The primary reasons for their migration were limited socioeconomic and employment opportunities, and the declining educational quality in Uzbekistan. Uzbek participants reported some difficulties in their resettlement, including language barriers, cultural challenges, and financial stress. Most participants felt welcomed by the host community, believed in the “American dream,” considered themselves successful, and envisioned their future in the US rather than in Uzbekistan. Across all interview questions, women tended to focus on their children’s well-being and the opportunity to gain personal freedom in terms of education and employment, whereas career aspirations and achievement of financial stability were the focus for men. The results from this study provide much-needed information about the life experiences of Uzbek immigrants in the US and have implications for future research with this understudied population from Central Asia.

Keywords: Uzbek immigrants, migration, resettlement, cultural adjustment, gender differences

The immigrant population in the United States (US) is the largest in the world; more than 40 million people living in the US were born in another country (Budiman, 2020). With future waves of immigration, the demographics of the US population will continue to change, resulting in increased diversity and awareness of new immigrant groups. Over the past two decades, the number of Uzbek immigrants in the US increased from 22,800 in 2000 to 65,126 in 2019 (US Census Bureau, 2020), making them the largest group of immigrants from Central Asia. For most Uzbeks who migrated to the US after 2000 (US Department of Homeland Security, 2021), the pathway for legal immigration has been the Diversity Immigrant Visa Program (DV Program) or Green Card Lottery. Among Central Asian countries, Uzbekistan is the country with the highest number of DV Program lottery winners (4,494), followed by Tajikistan (1,209), Kazakhstan (1,020), Kyrgyzstan (753), and Turkmenistan (306) (US Department of State, 2018). Over the last decade, researchers have explored migration and cultural adjustment of immigrants from post-Soviet countries but with a limited number of participants from Uzbekistan (Birman & Taylor-Ritzler, 2007; Birman & Trickett, 2001; Roytburd & Friedlander, 2008). Therefore, the primary goals of this qualitative study were to address this gap in the research literature and to identify the prominent themes related to the migration and resettlement of Uzbek immigrants in the US. In addition, we placed particular emphasis on exploring potential gender differences across these experiences.

Migration of Uzbek Immigrants to the US

The first wave of migration from Uzbekistan to the US began in 1991, after perestroika (refers to the restructuring of the Soviet political and economic system during the 1980s; for more information, see e.g., <https://www.history.com/topics/cold-war/perestroika-and-glasnost>) and the breakup of the Soviet Union. The Uzbek community in the US has grown quickly (Jackson, 2010; Kordunksy et al., 2012; Moskin, 2006), and currently, Uzbek immigrants reside in more than nineteen states (US Census Bureau, 2020). However, it is difficult to precisely quantify the number of Uzbek immigrants living in the US because prior to 2000, Uzbek immigrants were recorded as originating from the former Soviet Union. Official routes of migration employed by Uzbeks include the DV Program, student and tourist visas, and asylum (US Department of Homeland Security, 2021). However, the fastest way to come to the US remains the DV Program. In 2020, the number of Uzbeks who applied for the DV Program was 1,674,787 (2,572,653 with derivatives or 8% of the Uzbek population), making Uzbekistan the nation with the second-highest application rate after Ghana (US Department of State, 2022).

Uzbek migration is influenced by both push and pull factors, where push factors (e.g., political repression, lack of education, poverty) impact citizens’ motivation to leave Uzbekistan, and pull factors (e.g., better opportunities, employment, safety, political stability, psychological and physical well-being) attract people to relocate (Castles, 2013; Lee, 1966). The primary

reasons Uzbeks migrate to other countries are the lack of job opportunities, followed by low life satisfaction, job insecurity, and unemployment (Seitz, 2019). Researchers also noted that outdated education in Uzbekistan negatively impacts the quality of training, making Uzbeks less suited for the current job market, leading to unemployment and low life satisfaction (Library of Congress, 2007; Ruziev & Burkhanov, 2018). Uzbekistan's slow transition to a market economy also has been challenging for Uzbek citizens to adapt successfully under the new political and economic system (Batsaikhan & Dabrowski, 2017). These various push factors may reflect the pre-migration stress experienced by Uzbeks prior to their migration to the U.S.

For many immigrants, regardless of their status or reasons for migration, the relocation process is challenging and stressful (Dinh, 2009; Heleniak, 2004; Vinokurov et al., 2020; Yakushko, Watson et al., 2008). Immigrants experience depression, isolation, and homesickness both during and after migration. Immigrants may also experience pre-migration stress and face additional challenges after their relocation (American Psychological Association [APA], 2012, 2013).

Resettlement of Uzbek Immigrants in the US

Uzbek immigrants reside primarily on the West and East Coasts (US Census Bureau, 2020) and live in Russian-speaking ethnic enclaves (Vinokurov et al., 2020). For example, many Uzbeks living in New York City have recreated makhallas (neighborhoods or local communities), built thriving environments for the Uzbek community (e.g., supermarkets, restaurants, offices with bilingual staff), and replaced well-known post-Soviet Jewish neighborhoods, such as Brighton Beach, Sheepshead Bay, Bensonhurst in Brooklyn (Kordunsky et al., 2012), Forest Hills, Rego Park, and Kew Gardens in Queens (Jackson, 2010; Moskin, 2006).

Approximately 59% of Uzbek immigrants are proficient in English, and 53% have bachelor's degrees or more advanced degrees (US Census Bureau, 2020). However, most Uzbek immigrants prefer to speak Russian at home and maintain their customs, traditions, and post-Soviet values (Birman et al., 2005; Birman et al., 2014). Although most recent Uzbek immigrants are blue-collar workers, established immigrants have pursued careers in the arts, business, academia, and medicine. Additionally, Uzbek immigrants have established nonprofit organizations to raise awareness and serve the needs of the Uzbek and Central Asian com-

munities in the US (e.g., Turkestanian American Association, Uzbek American Association of Chicago).

The resettlement of immigrants and their adjustment to new social and cultural norms can be stressful, a process that can last from several months to several years or more (Dinh, 2009; Schwartz et al., 2006). Immigrants experience acculturative stress from various factors, including language barriers, social and cultural challenges, trauma-based problems, hostile attitudes from host communities (e.g., anti-immigrant comments), and discrimination (APA, 2012, 2013; Dinh & Le, 2019; Roytburd & Friedlander, 2008; Vinokurov et al., 2020; Yakushko, Backhaus et al., 2008). Many immigrants from post-Soviet countries, including Uzbekistan, value ethnically dense communities within the US (Vinokurov et al., 2020), where they can receive social support and maintain many facets of their pre-migration lifestyle (Birman & Trickett, 2001; Birman et al., 2005).

Gender Differences in Uzbekistan

Central Asian cultures are generally considered collectivistic and have traditional gender roles. Like other Central Asian countries, Uzbekistan is patriarchal: Men serve as "breadwinners" while women fulfill the primary duties as homemakers and family caregivers (Kamp, 2018). In Uzbekistan, early marriages, where one or both spouses enter marriage at the age of 18 or under, vary from 46% to 61%, depending on the region of the country (The State Committee of the Republic of Uzbekistan on Statistics, 2019). Typically, women tend to enter marriage earlier than men. Even though the literacy rate among school-age girls (7-15 years old) in Uzbekistan is 99.9%, young married women are limited in their access to higher education; they also face other risks associated with early marriage, including depression and domestic violence (Bacchus et al., 2018; Buzi et al., 2015; Chandra-Mouli et al., 2015). Additionally, girls and women in Uzbekistan have restricted freedom of choice, including reproductive rights (Kamp, 2018), especially after marriage. These gender disparities in education enable Uzbek men to further leverage the benefits of a patriarchal society and leave fewer opportunities for women in both education and employment.

The Current Study

Although there has been interest in understanding the experiences of Asian immigrants in the US, little research has explored the lives of immigrants

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

from Central Asia, especially those from Uzbekistan. This study, the first of its kind, was designed to address this gap. Using a thematic six-step analysis process (Braun & Clarke, 2006; Braun et al., 2019), this study identified common themes in the Uzbek migration and resettlement narratives, including the reasons for emigration from their homeland and the experiences of establishing a new life in the US. In addition, we explored potential gender differences in these migration and resettlement experiences.

Research Team

In qualitative research, it is important to present the research team's background information that is relevant to the current research work. The research team for this study was comprised of three researchers at the master's or doctoral level in their training and academic career. The first and third authors were born in Uzbekistan. They are fluent or proficient in English, Russian, and Uzbek languages and familiar with Uzbek culture and immigration issues. The second author was born in Vietnam and has conducted extensive research with Asian and Latinx immigrant and refugee populations in the U.S.

Method

Participants

Twenty Uzbek immigrants residing in the US (10 female participants and 10 male participants, according to participants' self-identification and pronouns preference), ranging in age from 20–48 years old ($M = 32$; $SD = 6.88$), participated in the study. Nineteen participants were born in Uzbekistan, and one was born in Russia but arrived in Uzbekistan by the age of one and was raised there. Most participants identified as Uzbek ($n = 14$) or mixed ethnicity ($n = 3$; Uzbek-Russian, Uzbek-Korean-Russian, Uzbek-Greek). 90% of participants achieved a bachelor's degree or higher and 10% were in the process of completing a bachelor's degree. Regarding socioeconomic status, 70% identified as middle class, 20% as lower class, and 10% as upper-middle class. In terms of living accommodations, 65% rented a house or apartment and 35% owned a house. Please see Table 1 for a summary of participants' demographic information.

Migration and Resettlement-Related Demographic Information

The participants' year of immigration ranged from 1993 to 2017, with an average of 8.55 years of res-

idence in the US. The mean age of participants at the time of migration was 23.25 years old, ranging from 8 to 42 years old. 30% of participants migrated through the DV Program, 20% via student visa, 15% via tourist visa, 15% via work and travel program, 15% via unification with family, and 5% did not specify visa type. All participants were US citizens or permanent residents at the time of their interview. Most participants migrated to the US alone, while other participants migrated with parents, siblings, or spouses and children. At the time of their migration, 10 participants had relatives in the US and 18 had friends from Uzbekistan who were living in the US. At the time of their interview, participants were residing in 10 states and the District of Columbia. The primary languages in participants' homes in Uzbekistan were a mix of Uzbek and Russian ($n = 13$), Uzbek alone ($n = 4$), and Russian alone ($n = 3$). After migration, many Uzbeks used a mix of English and Russian at home ($n = 8$), followed by English ($n = 4$), Russian ($n = 3$), a mix of Uzbek, English, and Russian ($n = 3$), a mix of English, Russian, and Croatian ($n = 1$), and a mix of Uzbek and English ($n = 1$). None of our participants used Uzbek as their primary language at home after migration. An equal number of female and male participants learned English in Uzbekistan ($n = 16$). Please see Table 2 for additional migration and resettlement-related demographic information.

Procedure

Following approval by the Institutional Review Board to conduct this research study, we recruited participants through social media posts on Facebook, LinkedIn, and Instagram (please see Appendix A: Recruitment Invitation for Social Media Posts- English version). The recruitment invitation, in Russian and English, was posted on Uzbek immigrant Facebook groups (e.g., Uzbeks in USA, American Uzbekistan Association, Uzbek Cultural Garden of Cleveland) and on the first author's LinkedIn and Instagram pages and was reposted by the members of these social groups 65 times within the first 72 hours. Interested participants contacted the first author through social media messaging platforms who then confirmed their eligibility through follow-up emails. To be eligible, the study required participants to be at least 18 years old, have been born in Uzbekistan or the Uzbek Union of Soviet Socialist Republic (Uzbek USSR), and reside in the U.S. as U.S. citizens or permanent residents. Excluded from study participa-

tion were Uzbek individuals on student or work visas.

A total of 63 individuals expressed an interest in participating in the study. Those eligible for the study were scheduled for an individual interview on a “first come, first serve” basis until the 20-interview goal was reached for the study, with 10 female and 10 male participants. We decided on 20 interviews because according to Guest et al. (2006) and Morgan et al. (2002), the first five-six interviews produce most of the information for qualitative research and after the 20th interview, there is little new information to be gained from additional interviews. Prior to the scheduled interview, each participant received an email reminder that provided interview instructions and an informed consent form (please see Appendix B). Study participants received no financial compensation or other incentives.

Each participant took part in a one-hour audiotaped interview and had the option to be interviewed in English or Russian. The selection of language options was based on the first author’s experiences in the Uzbek primary and secondary educational systems, in which students have more exposure to the teaching of the Russian language than the Uzbek language. The language options were also based on the first author’s stronger fluency in the Russian language over the Uzbek language, making it easier to conduct the interviews and do the transcription and translation work. However, during the interview participants were not restricted from using the Uzbek language, so they were free to add specific words or phrases related to cultural context (e.g., gap – gathering). Interviews in English ($n = 11$) were transcribed by a transcribing service (TEMI). Interviews in Russian ($n = 9$) were translated and transcribed by the first author, who is fluent in English and Russian, and proficient in Uzbek languages. The first author checked these interviews for cultural nuances, such as noting the specific vocabulary used by participants (e.g., *kelin* – bride, *makhalla* – community, neighborhood).

Measures

Participants responded to demographic questions about their age, gender, place of birth, ethnicity, current residence, educational level, marital status, spoken languages, socioeconomic status, and year of migration. After the completion of demographic questions, the interviewer asked participants a set of open-ended questions related to migration and resettlement experiences. In relation to their migra-

tion, we were interested to learn about their reasons for migration to the US (e.g., Why did you leave your home country?). In relation to their resettlement, we explored their adjustment to the US (e.g., Did you feel welcomed? Did you have any challenges? What were your expectations about life in the US?) For the full set of interview questions, please refer to Appendix C.

Data Analysis

A thematic analysis approach was used for coding and analysis to identify the most common themes across participant interviews (Braun & Clarke, 2006; Braun et al., 2019; Clarke & Braun, 2015). The primary goal was to explore the lives of Uzbek immigrants in the context of migration and resettlement. Therefore, a data-driven approach was used to generate the themes inductively (Braun & Clarke, 2006). To ensure analyst triangulation (Patton, 2015), two coders (first and third authors) individually coded interviews and then reviewed the findings. The coders reached inductive thematic saturation on the eleventh interview when no new codes or themes emerged from the data (Saunders et al., 2018). To reduce errors in translation or loss of cultural nuances, the coders paid close attention to interviews in which the participant spoke in both Russian and Uzbek. To accurately capture meaning across different languages, both coders were fluent or proficient in all three languages (English, Russian, and Uzbek) and were familiar with Uzbek culture and practices.

The data analysis employed Braun and Clark’s (2006, 2016) six-step process of thematic analysis to measure reliability, especially when codes were derived inductively. First, the coders read all interviews multiple times to familiarize themselves with the data. In this initial stage, they did not develop any codes nor analyzed any themes. However, the first author wrote casual memos on potential insights and observations (Boyatzis, 1998; Denzin & Lincoln, 2000). The second phase included the completion of the initial coding of the transcripts by the first author, who recorded these codes in a codebook. The coders used *in vivo* coding and assigned labels to sections of data (e.g., sentences or paragraphs) by using a specific word or short phrase. After the first author coded all interviews, the second coder coded 20% of the interviews (four interviews) as recommended to meet the saturation and accuracy criteria (Boyatzis, 1998; Guest et al., 2006). In the third phase, the coders categorized the most common codes, based on both coders’ responses, and identified

potential themes. Any discrepancies in coding were discussed and resolved through consensus. During the fourth phase, the coders reviewed the themes and the relationships between them. The coding and analysis yielded four main themes in two categories that highlighted participants' experiences. Once the themes and the overall structure of the analysis have been identified, the fifth phase focused on defining these themes and extracting quotations from the interviews to illustrate the data. In the final sixth phase, in the Results section of this paper, we contextualized our analysis, presenting the major themes, and in the Discussion section, we highlighted the main contributions and limitations of our study (Clarke et al., 2015).

Results

The interview data yielded four key themes (Table 3): (a) migration for better opportunities under the migration category; and three themes under the resettlement category, (b) support and challenges in new home, (c) expectations and adaptation, and (d) "American Dream" and future plans. We also presented our findings on gender differences within each category.

Migration for Better Opportunities

Most participants ($n = 19$) migrated to the US voluntarily, excluding one participant who responded that their migration was involuntary due to their age (the participant was a minor at the time of relocation). 95% of participants stated that the main reason for their migration was an overall lack of opportunities in Uzbekistan in concert with financial stability in the US. For example, a 31-year-old male participant reported, "I saw more opportunities here [US]. I decided to leave because I had no future prospects in there [Uzbekistan]; [laughing] our generation, come on, they all left, the majority left." Overall, push factors for many participants were critical in their decision to migrate, including unemployment and financial instability ($n = 4$) and limited opportunities for their children, such as poor educational quality ($n = 8$). Among pull factors, participants mentioned employment opportunities ($n = 5$), ability to travel ($n = 1$), unification with family ($n = 1$), and furthering their education ($n = 1$).

Regarding gender differences, twice as many women (80%) as men (40%) highlighted push factors as their primary reason for migration. Of the four male participants who responded that push factors were their primary reasons for migration, three were minors at the

time of their relocation but only one mentioned involuntary migration. Women ($n = 8$) reported limited economic opportunities to sustain a family and limited educational opportunities for their children, whereas men highlighted limited job opportunities as their primary reasons for migration. Among pull factors, one woman reported unification with a spouse and another woman mentioned furthering education as their primary reason for migration, whereas men's responses focused on employment opportunities in the US.

Familiarity with the host country dictated the migration pattern for participants. Before permanent relocation to the US, three female participants had studied in the US as exchange students. No male participants studied in the US prior to migration. Ten participants visited the US to familiarize themselves with the host country before relocation; these participants held a nonpermanent visa at the time of their visit (e.g., student, work-travel, tourist visa), of whom, six (all women) stayed in the US one month or longer. All six women and two men returned to Uzbekistan before migrating to the US permanently. The other two male participants pursued permanent visas while visiting the US (i.e., they changed a student visa to a green card application).

Resettlement

Support and Challenges in New Home

Relating to resettlement experiences, 75% of participants ($n = 15$) reported feeling welcomed and receiving support from the host community (e.g., neighbors, teachers). Additionally, 10% of participants ($n = 2$) reported receiving support from a Russian-speaking immigrant community where they were living. Despite participants highlighting the host community as welcoming and open-minded toward learning about their experiences and home country, a 33-year-old male participant recalled being bullied in school because he did not speak English, "The first probably 2 years were difficult at school, the adjustment period because we're, we didn't speak the language...we did not fit in very well." Another male participant also faced discrimination but from a Russian-speaking person. One female participant who felt unwelcome for several years responded that she had no access to communication with either a Russian-speaking community or an American community due to her isolated residential area and inability to drive. Regarding gender differences, more women (90%) than men (60%) reported feeling welcomed

and supported by the mainstream host community.

50% of participants ($n = 10$) reported experiencing difficulties in their resettlement process. Five participants noted the language barrier and cultural differences as the most difficult aspects of their adjustment, followed by financial struggles ($n = 3$), paperwork ($n = 1$), and separation anxiety ($n = 1$). For some women ($n = 2$) and men ($n = 3$), language and cultural differences played a role in their adjustment, "When I came over, I did speak no English at all. It was difficult transition because, you know, different culture, different traditions, different way of life, different pace" (26-year-old male participant). Two female participants and one male participant faced financial difficulties. However, the former associated these difficulties with the pressure of having to financially support their family in Uzbekistan:

I somehow had to convince them [parents] that if I go to the US, I will be working and I will be sending money. Moreover, um, that was the only thing I think my mother liked about going to the US that I would be supporting them financially. That was the only reason how she allowed me to go. (28-year-old female participant).

Expectations and Adaptation

70% ($n = 14$) of participants had expectations before they migrated to the US; 65% ($n = 13$) thought that adaptation and achieving goals would be faster and easier. For example, a 32-year-old male participant stated, "I thought... everything is easy, and money grows on the trees...I did not expect it to be that challenging...." A few other participants also highlighted the notion of money growing on trees. Many participants, even those who did not have expectations, noted that social media and movies influenced their perception of life in the US and cultivated the idea of easy goal achievements

I have never heard about the state where we came [to]. All that [I] heard was New York, Los Angeles, Miami, three cities that everyone knows, unfortunately... When you watch movies, you watch it from the lens of Hollywood, and of course, movies are movies, but you have this notion like, 'Oh, OK, so America is like this.' Unfortunately, when I came, reality hit me, everything what I expected fell down because it was tough, especially when I came to Ohio, and I saw 2 meters of snow. (24-year-old female participant).

In relation to gender, more men ($n = 8$) than women ($n = 6$) reported having expectations about

life in the US; one woman expected more freedom of expression and five women stated that life would be easier in professional and personal matters, but eight men expected that the process of adaptation itself would be easier. Only two participants, both men, mentioned hard work as a factor in achieving their goals, "without effort, you won't even pull a fish out of a pond." Five participants shared that they did not have any expectations due to their age. Four women noted maturity and preparedness to migrate. For example, a 41-year-old female participant stated, "I'm actually a person with my experience and age [old enough], and whatever lessons I learned in my life, I don't have any expectations." One male participant shared that he had no expectations because he was underage at the time of his migration. Another male participant did not respond to this question.

"American Dream" and Future Plans

Nearly all participants (90%) believed in the "American Dream," and more than half (55%) considered themselves successful. Also, more than half of the participants ($n = 13$) described the "American Dream" as an opportunity to achieve goals, as exemplified in a statement by a 33-year-old male participant, "[The] 'American Dream' means whatever you dream of that you want to do in life, you can do it by working very hard, by committing time, by committing effort that you can accomplish those." Regarding gender differences, fewer women (80%) than men (100%) believed in the "American Dream." 90% of men ($n = 9$) but only 10% of women ($n = 1$) described their "American Dream" as the achievement of professional goals and financial stability. 40% of women ($n = 4$) associated the "American Dream" with freedom of choice and expression. For 30% of the women ($n = 3$) and 10% of the men, the "American Dream" was linked to family goals, such as raising children and balancing their professional and personal life.

All participants defined what success meant to them; while 90% of the men defined success as achieving goals and gaining financial stability, only 10% defined it as having a family. For 70% of the women, success was an ability to work and study the subject of their choice, whereas 30% of the women defined success as creating and building family relationships. When asked about success, of the 55% of participants who defined themselves as successful, six were women and five were men.

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

Regarding future plans, reverse migration was not an option for 13 participants (65%). Although six participants (two women and four men) considered returning to Uzbekistan permanently, they all discussed the importance of first achieving their life goals in the US. Because of close family bonds back home, only one participant was confident in their decision to return to Uzbekistan permanently. Regarding gender, seven women and six men expressed their desire to stay and build their future in the US. Most female participants ($n = 7$) stated they would like to stay as an “independent woman,” or “wanted to escape living in Uzbek mentality.” Some male participants ($n = 4$) also expressed similar sentiments about not wanting to return to Uzbekistan, as shown in the following statement, “I feel like my outlook and values have become different, perhaps even my mentality has changed. It is most likely that I will struggle adapting to that life and my profession allows to live more comfortably here” (35-year-old male participant).

Discussion

Our study sought to explore the life experiences of Uzbek immigrants in relation to their migration and resettlement in the US. Particularly, we aimed to explore the reasons for their migration, understand various aspects of their resettlement, and examine potential gender differences in their experiences.

Migration and Resettlement Experiences

Similar to the experiences of other immigrants (e.g., Marcus, 2009; Paat, 2013), there were various push and pull factors underlying the reasons for Uzbek immigrants to start a new life in the US. Many participants shared that limited socioeconomic and employment opportunities and a declining level of educational quality in their homeland influenced their decision to migrate to the US. Concurrently, pull factors, such as their expectations for a better life in the US (i.e., improved socioeconomic, employment, and educational opportunities), unification with family members, and perceived opportunities to experience more personal freedom and liberties (e.g., freedom to make decisions for themselves, freedom to pursue their life interests, freedom to travel) further reinforced their conviction to leave their home country. These migration narratives of Uzbek immigrants contribute to the rich history of voluntary and involuntary migrations of various cultural groups to the US (e.g., Barkan, 2013; Takaki, 1998).

The resettlement process of Uzbek immigrants encompassed positive and negative experiences, pointing to the complex dynamics of adjusting to a new cultural context like the US. For example, most participants felt welcomed by the host community, but some experienced discrimination and bullying. Most participants also reported proficiency in English, but some described considerable language and cultural difficulties. These factors, either positive or negative aspects, can have major influences on subsequent adjustment and adaptation to U.S. society. In this study, most participants migrated to the U.S. alone, meaning they left much of their family and social network in Uzbekistan, so the extent of support they received from the host or existing Russian-speaking communities may be crucial in their resettlement and consequently in navigating any related challenges, including language, cultural, economic, employment, educational, or other difficulties. Findings from previous research have shown the importance of social support from the host and existing immigrant communities in the resettlement process and the well-being of various immigrant groups (e.g., Jasinskaja-Lahti et al., 2006; Msengi et al., 2015). Furthermore, the degree of discrepancies in the expectations they had about life in the US pre-migration and their actual life in the US post-migration also may have influenced the quality of their resettlement experiences (Negy et al., 2009).

Despite the various challenges in the migration and resettlement processes, nearly all participants expressed a belief in the “American Dream” and stated that freedom of choice, financial stability, and the ability to provide for their families represent the primary pillars of their “American Dream.” Although various scholars have written about the myth of the “American Dream” (e.g., Tittenbrun, 2015), for Uzbek immigrants, their positive belief and hopefulness in this dream might have buffered some of the stresses and challenges they faced in the resettlement process. Previous research has shown the connection between positive attitudes toward migration and positive adjustment to a host country (Gong et al., 2011; Vinokurov et al., 2020). Indeed, half of the participants in this study reported little or no difficulties in their resettlement process and more than half considered themselves successful. However, it is also important to note that most participants in this study reported high levels of education, English proficiency, and so

cioeconomic status, as well as having opportunities to visit the US prior to their permanent relocation, which all can facilitate more positive resettlement outcomes for immigrants (e.g., Zlobina et al., 2006).

Like many immigrant groups before them, most participants envisioned their future in the US rather than returning to their homeland, citing various economic, social, and cultural reasons. Because most participants often linked achieving their life goals and being successful to financial stability and personal freedom, this connection may be a primary reason as to why they did not imagine their future life in Uzbekistan where they perceived limited economic and educational opportunities and individual rights. This is not to say there are not limited opportunities or individual rights in the US, but rather this reflects the participants' perceptions of life in their home country versus life in the US. Additionally, many participants mentioned their "change in mentality" and newly adopted values in the US. These changes may be related to the number of years they have spent in the US, as supported by the findings of Kwak and Berry (2001), showing that time spent in a host country is positively associated with changes in identity development, assimilation, and the development of new cultural and personal values.

Gender Differences

There were patterns of gender differences across interview questions regarding migration and resettlement experiences. For most women, push factors were the primary reasons for their migration (limited economic and educational opportunities for themselves and their children in Uzbekistan), whereas pull factors were the primary reasons for men (employment and economic opportunities in the US). More women than men felt welcomed by their host community, whereas more men than women expressed a belief in the "American Dream." These differences may have a differential impact on subsequent adjustment for women and men in US society (Dion & Dion, 2002). Additionally, women tended to define success as the freedom to pursue educational and employment opportunities and to attend to their family's well-being, whereas men's definition of success focused on individual goal achievements and financial stability. These differences in migration and resettlement experiences appear to reflect gender socialization and gender roles of women and men in Uzbekistan (e.g., Kamp, 2018), which can play out in the process of their adaptation to US society.

Limitations of the Present Study

We recognize several limitations in our study. Although we carefully tried to recruit Uzbek immigrants from diverse educational and socioeconomic backgrounds, most participants reported having a bachelor's degree or higher, English proficiency prior to migration, and middle-class status at the time of the interview. Therefore, the study results may reflect sample selection bias; immigrants of differing socioeconomic and educational backgrounds from those in our study may have other perspectives on migration and resettlement. Future work should consider the experiences of Uzbek immigrants from diverse educational, social, and economic backgrounds, as these factors would provide a more comprehensive and nuanced understanding of the life experiences of Uzbek immigrants in the US. A second limitation was the languages in which the interviews were conducted, either English or Russian, although many participants used a few Uzbek words or phrases in their interviews. We recognize these language options might have restricted participation by immigrants from rural Uzbekistan, where the majority speak the Uzbek language. Future studies should consider including Uzbek immigrants from rural areas and interviewing them in Uzbek, as it may reveal more diverse perspectives on migration and resettlement experiences. In addition, we recruited participants through social media platforms predominantly used in the United States (e.g., Facebook, LinkedIn, Instagram) and therefore reached individuals who have high English language proficiency and have adjusted well in the US. The results may be different for those with less English proficiency and less exposure to the host community where the primary language is English. Similar to conducting participant interviews in Uzbek, recruitment on Uzbek-speaking platforms (e.g., Telegram) may also bring additional perspectives and insights into the life experiences of Uzbek immigrants.

Implications for Future Research

Despite the limitations, the results from this study have implications for future research with Uzbek immigrants and other groups from Central Asia. Our study identified specific push and pull factors for Uzbek migration to the US, but we suggest that future research examines more in-depth the contextual aspects surrounding these factors. For example, a focus on the family context and dynamics would provide richer data for understanding the reasons underlying

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

their decision to start a new life in a new country far from their homeland. Additionally, an examination of the current sociopolitical context of Uzbekistan, a post-Soviet country, would provide a more macro understanding of the reasons for Uzbek migration to the US. Similarly, we also identified some prominent themes in their resettlement experiences that can inform future research to replicate and expand on the current findings. For example, our understanding of resettlement experiences would benefit from future inquiries on the elements that constitute a welcoming host or receiving society as they can determine subsequent life outcomes for Uzbek immigrants. Furthermore, because Uzbek immigrants comprise the largest group from Central Asia to receive the DV Program status in the US, this provides opportunities to conduct longitudinal research, utilizing both qualitative and quantitative methodologies to delve into the processes of pre-migration, migration, and post-migration over time. Finally, we suggest any future research with immigrants from Uzbekistan or Central Asia to attend to gender issues as they may play a role in aspects of migration and resettlement. Altogether, these future research directions would yield a more complete picture of the life experiences of Uzbek immigrants.

Conclusion

This qualitative study is the first of its kind to explore the life narratives of Uzbek immigrants in the US, focusing on their migration and resettlement experiences. Through a six-step thematic analysis, the participants' narratives highlighted four major themes, as well as the push and pull factors that compelled them to leave their home country and establish a new life in a new cultural context. Although there were some challenges in their experiences, many perceived their new life as part of the "American Dream," full of possibilities to achieve the educational, economic, and career goals they had for themselves and their family. Their new country is where they envisioned their future and thus, they have become a part of the rich and complex tapestry of immigration to the US.

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MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

Table 1

Participant Demographic Information

Characteristics	Women (<i>n</i> =10)		Men (<i>n</i> =10)		Full Sample (<i>N</i> =20)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Country of Birth						
Uzbekistan	9	90	10	100	19	95
Russia	1	10	0	0	1	5
Ethnicity						
Uzbek	7	70	7	70	14	70
Mixed Race	2	20	1	10	3	15
Russian	0	0	1	10	1	5
Uyghur	0	0	1	10	1	5
Kazakh	1	10	0	0	1	5
Highest Educational Level						
Incomplete Bachelor's	0	0	2	20	2	10
Bachelor's	4	40	6	60	10	50
Master's	5	50	2	20	7	35
Doctoral	1	10	0	0	1	5
Socioeconomic status						
Low	4	40	0	0	4	20
Middle	5	50	9	90	14	70
Upper middle	1	10	1	10	2	10
Living Accommodation						
Rent	6	60	7	70	13	65
Own	4	40	3	30	7	35

Table 2

Migration and Resettlement-Related Demographic Information

Characteristics	Women (<i>n</i> =10)		Men (<i>n</i> =10)		Full Sample (<i>N</i> =20)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Accompanying Immigrant Member						
Alone	6	60	6	60	12	60
Parents and siblings	2	20	1	10	3	15
Parents	0	0	2	20	2	10
Siblings	0	0	1	10	1	5
Children	1	10	0	0	1	5
Spouse and children	1	10	0	0	1	5
Region of Residence						
Northeast (NY, NH, CT, ME)	4	40	4	40	8	40
South (NC, VA, GA, DC)	4	40	3	30	7	35
Midwest (OH, MO)	2	20	2	20	4	20
West (CA)	0	0	1	10	1	5
Visa upon Arrival						
Diversity visa (Green card)	2	20	4	40	6	30
Student visa	4	40	0	0	4	20
Tourist visa	2	20	1	10	3	15
Work and travel visa	1	10	2	20	3	15
Unification with a family	1	10	2	20	3	15
Unspecified	0	0	1	10	1	5
Spoken Languages						
Before Migration:						
Uzbek, Russian	6	60	7	70	13	65
Uzbek	2	20	2	20	4	20
Russian	2	20	1	10	3	15
After Migration:						
Uzbek	0	0	0	0	0	0
Uzbek, English	1	10	0	0	1	5
English, Russian	3	30	5	50	8	40
English	3	30	1	10	4	20
Russian	1	10	2	20	3	15
Uzbek, English, Russian	1	10	2	20	3	15
English, Russian, Croatian	1	10	0	0	1	5

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

Table 3

Participants Themes

Themes	Sample Quotations	Women (<i>n</i> =10)	Men (<i>n</i> =10)	Full Sample (<i>N</i> =20)
Migration for Better Opportunities				
Limited opportunities for children	<p>“I was divorced with 3 children. Since a doctor’s salary was very low in Uzbekistan, I wasn’t able to pay for their (kids’) education. Both of my girls got accepted into a university at the same time, and I thought from the financial standpoint that I was in America because I was here before and [I knew] it was very easy to find a job and pay for their education. That’s how I decided to make this step, I just had a strong desire to give proper education to my children.” (47 years old female participant)</p> <p>“So, um, main reason was, (pause) main reason was, it was an opportunity to move to U.S. and to, I think it was the mainly uncertainty off the state that I lived in. Basically I think resulted corruption and that you couldn’t achieved anything on your own. Um, you either have to know someone or like corrupt someone, bribe someone and stuff like that. [...] he got exposed to kind of a western lifestyle and then he looked into it, he looked into the opportunities for the future for his kids.” (33 years old male participant)</p>	5	3	8
Unemployment and financial instability	<p>“I grew up in a very poor community and my parents are also still, they still live in village where I’m from. Um, they don’t have</p>	3	6	9

(seeking employment opportunities in the U.S.)	to say, we were not granted too much. Um, people have hard lives. You have to work really hard for like, for literally for a small amount of money. And so, I couldn't, I didn't want to go back to that community again, work in some kind of school in the village, um, either want out.” (29 years old female participant)			
	“It was just economic, economic that's been my mother was divorced and um, she was economically doing not well in Uzbekistan, and so at the time my aunt, my uncle were living in United States and there were opportunities to, um, you know, have a better life for herself and then as well as um, her children – me.” (33 years old male participant)			
Unification with family	“Love, love (laughing) I fall in love, get married (laughing). Honestly speaking if not my husband, I would stay in Uzbekistan, I had everything in there especially my parents are there.” (33 years old female participant)	1	0	1
Ability to travel	“Um, initially it was to travel and explore, you know, and experienced the life in U.S. and work, I participated in this work and travel program, and after being here for a while and decided to stay.” (33 years old male participant)	0	1	1
Further education	“I first it came from pursued of further education, to further my higher education, to be specific to get my master's degree, and then once I was here, I decided that it was the right decision, and I basically stayed to improve my life conditions, to seek, seek better professional opportunities.” (29 years old female participant)	1	0	1

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

Resettlement

Supported by the host community	<p>“People always, like offering their help with everything basically. Teaching me to drive, helping with different, like, questions I have about the application process to get my green card and all of those this, yes, very welcomed because people extended their genuine hand of help if we can call it so.” (29 years old female participant)</p>	9	6	15
	<p>“[...]the American community, they were very curious to hear our stories, how we came about, coming here making the choices. And, they were more than happy to help us out get settled. And my dad’s job as well, there were a lot of individuals who donated a lot of items to help us get settled and, you know, uh, started up.” (21 years old male participant)</p>			
Supported by immigrant community	<p>“My parents made everything possible, so we can have impression from the U.S. I did not feel myself as a stranger. Also, we have a large Russian-speaking community in Cleveland, and I never feel myself as a stranger.” (35 years old male participant)</p>	0	2	2
Did not receive support	<p>“We lived in an apartment complex where neighbors don’t really talk to each other. I didn’t have a job because I was in a small town in Louisiana and didn’t work. Besides my husband I didn’t really talk to anyone.” (32 years old female participant)</p>	1	2	3
	<p>“We didn’t have all the money to, enough money to get to the airport [...] so he dropped us off right in the middle of highway. And so, it was me, my mom and two young children with number of</p>			

suitcases and it was um, you know, we none of us spoke the language. None of us knew the country and the culture. And we couldn't believe that Russian person who spoke our language just left us in the middle of the street. So, we, we felt, I mean, we were very scared at that time.” (33 years old male participant)

Challenges

Language barrier and cultural differences

“I would say just not knowing the language was my difficulty. I do recall, you know, going through ESL classes and basically not knowing English at all but other than that, it was just my father and my brothers trying to, you know, work two to three jobs and survive.” (34 years old female participant)

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“I came here, I was 16 [...] I knew only like two or three people. All of them are adults that my father knew. And it was kinda, it was kinda of a culture shock I guess. It was not what I was expecting that I saw in the movies [...] I started working when I was 16 years old, so it was mixture of not knowing anyone, mixture of finding, a tough time, finding a job and even if you did, tough time of working at the age of 16, like 16 hours a day and stuff like that to make some money support yourself, support your family, it's like not doing what you planned for and just like going to college and stuff like that [...] I took me about like two years, start understanding what, I start understanding what people are saying by like year, year and a half, and for a full conversation took me about 2-3 years.” (33 years old male participant)

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

Financial struggle	<p>“Financial part was problem [...] I’m from very conservative family. My parents didn’t seem to like the idea of, um, like young girl going to different country [...] So, I somehow had to convince them that if I go to U.S., I’ll be working and I’ll be sending money. And, um, that was the only thing I think my mother liked about going to U.S. that I would be supporting them financially. That was the only reason how she allowed me to go.” (29 years old female participant)</p> <p>“Obviously it was difficult in the beginning because everything was new, um everything was unknown. It was difficult financially and also, I had to get used to a new city, new environment.” (28 years old male participant)</p>	2	1	3
Paperwork	<p>“The process itself was lengthy. We were not in rush, so we did everything by ourselves, no lawyers. So, that’s why it took a little bit longer. Also, because we did not know the process, sometimes, we spent too much time in preparing documents. Um, I can say that the procedure was not easy but not super challenging.” (32 years old male participant)</p>	0	1	1
Separation anxiety	<p>“But the most difficult thing for me was separation from my big family. My parents worry so much, and of course, it is one of the layer of struggles being here.” (33 years old female participant)</p>	1	0	1
Expectations and Adaptation				
Expected easier transition	<p>“Honestly speaking, I had a lot of classmates who moved to the U.S. and at that time, I was thinking so if everyone leaves, then</p>	5	8	13

everything is perfect there, money is on the left and the right [meaning: money everywhere and easy to earn], easy to find a job, easy to earn, everything is easy, life is easier, no bureaucracy like here, everything is much easier.” (24 years old female participant)

“The money grows on trees. So, I mean, even now when I go back to Central Asia, a lot of people think that they, you come to the United States and money grows on trees and I, when I, when I was, you know, young and in, in Uzbekistan that's what I was saying, you know, you, because of Hollywood, we watch, we watch movies and we assume it's one thing. In reality it's, it's, it's different.” (33 years old male participant)

Expected freedom	“Freedom of expression I would say of my views, of any kind freedom to be myself basically and especially like my rights as a woman, having equal rights and equal faith with men. That's especially would I value here, and I can't really have 100% back home.” (29 years old female participant)	1	0	1
No expectations	“I have no expectations [...] I did not rely on America, didn't have expectations that America would give me a wealthy life, my diploma would be approved and I would be a doctor here and would make lots of money [...] I came with no such expectations.” (47 years old female participant)	4	1	5
	“I didn't know anything back then when I first started or when we first moved in I didn't know what to expect. I've just heard stories of just better opportunity, more			

MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

opportunity but I honestly, I didn't know what that meant [...]I had no expectations.”
(33 years old male participant)

“American Dream”
and Future Plans

Goals
achievement
and financial
stability

“For me, it [American Dream] is an opportunity to achieve my goals in career, um, and work where I want to work, um, not only with the connections but also with my dedication and persistence.” (26 years old female participant)

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“American dream means (long pause) when people that I love are next to me and I am able to support them. American dream to me is when I am healthy, able to develop myself in both professional and personal ways, with a strong and loved family, and when I am able to support my family, um, financially, physically, emotionally, um it is also um when I can become a self-made person.” (31 years old male participant)

Freedom of
choice

“I feel like I have been oppressed because I'm a female, even back in Uzbekistan, like I grew up with the mentality like, father, your father came home, he is tired, he is tired, working all day long, go back to your, go back to kitchen, don't come out when your father is here or like don't talk when a man is talking. [...] I was introduced to this, a concept of like, I don't have to do that anymore [in the U.S.]. I am equal, I can be as good, maybe I am even better than them. So, which I love like you know, I've, I was never given that opportunity for us [...] so with American, I don't have to pretend, I can be whatever I want and they will just equally love me just, just the way I was

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presenting myself, you know?” (29 years old female participant)

Family goals	<p>“To have a house where kids might feel comfortable, help them to get an education, send them to good universities, have an ability to travel, also have a stability in the country, peace in the country, because you know all these racial conflicts, I am scared that they might affect my kids [...] American dream is to raise kids in a way where I could be proud of them one day.” (33 years old female participant)</p>	3	1	4
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“I think for us, it means to raise good children, kind children, children who appreciate, and make them educated and ready for life, and help them always, um, to have opportunities, opportunities to choose, I think creating this kind of atmosphere is a part of the American dream. Be able to create this atmosphere (pause) because there are countries where people have no choice at all. Um, here, um, yes, of course, there are some circumstances when you have no choice, but it is possible to create the atmosphere for children where they can grow up kind, intelligent, and ready for life, I think this is the main priority.” (32 years old male participant)

Future Plans

Do not consider reverse migration	<div style="text-align: right; margin-bottom: 5px;"></div> <p>“Despite the fact that women can work, after marriage they um people think in a very old and traditional way like if a man earns enough, why do you have to work, um you take care of your home. Because I live here for a very long time, and I get used to the fact that you are more independent, and no one tells you like the society when you</p>	7	6	13
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MIGRATION AND RESETTLEMENT OF UZBEK IMMIGRANTS

have to get married or give birth [...] and continue doing what you were doing, but there, they will not understand it. So, I think it will be more challenging for me to live there.” (24 years old female participant)

“I feel like my outlook and values have become different, perhaps even my mentality has changed. It is most likely that I will struggle adapting to that life and my profession allows to live more comfortably here.” (35 years old female participant)

Considering reverse migration

“Why not, but I want to go there after I achieve something here, let’s say, I do not want to go back right now without things that I plan to achieve here. Maybe in 10 or 20 years or maybe more.” (26 years old female participant)

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“Once I’m a little bit more closer to maybe retirement, my kids are, you know, on their own, that might be another, you know, I may consider going back. I mean there’s a lot of things that I like about, Uzbekistan, in Tashkent, I love the culture, I love the food, I love the people. I love the landscape [...] there’s just a lot of things that I really enjoyed about Uzbekistan, but (pause) you know, who knows maybe in the future later on once kids are on their own, and I’m closer towards to the end of my career.” (35 years old male participant)

Confident in reverse migration

“If not my husband, I would definitely go back... with my kids. I had a really good job there, I have parents there, a lot of relatives, also our values are different. Here, you always have to have your hand on pulse to protect them from this bad influence, of course, there is also a bad influence but

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because I know that system, I think it would be easier for me to navigate there. If I would have a chance to go back and have my old job, to be with my family, with my relatives, of course, I would go back. My husband would never do this for me.” (33 years old female participant)

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