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# Journal of Psychological Inquiry

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## FROM THE EDITOR'S DESK

Almost two years ago, in the Spring 2020 issue, my dear friend and previous editor for this journal, Julianne Wright, was reflecting on the rise of Covid-19 in her Editor's Desk notes. She asked a simple question, "Will things every really be normal again?" Her answer was no, but she was also caught in the very beginning of the pandemic. Since then, a lot has changed, and the research presented in this issue represents that.

In some ways, normalcy seems to be returning, as students settle back down into attending in-person classes and seeing each other on a daily basis. At the same time, it sometimes feels like there is more distance between people than there used to be, and I think a lot of people are still struggling to adapt to returning to in-person life. This seems particularly salient for the students who began their college careers as the Covid-19 pandemic began, and are

just now recently experiencing college how it was meant to be for the first time. Those same students are the ones who are likely beginning to work on undergraduate research now.

With that having been said, this issue contains some incredibly thorough and detailed research. It has been a great honor for me to work on this journal, and I look forward to seeing the research in the Spring 2023 Issue.

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## A REVIEW OF MEDICATION-ASSISTED TREATMENT FOR OPIOID ADDICTION

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**Abstract** – The United States is in the midst of an opioid crisis. Pursuing effective treatment for opioid addiction to combat the adverse health and socioeconomic impact associated with the opioid crisis is a national emergency. Currently, the Food and Drug Administration has approved three medications (methadone, buprenorphine, and naltrexone) to treat opioid addiction. Although previous reviews of medication-assisted treatment of opioid addiction provide a useful guideline to health care providers, keeping the information updated as new evidence emerges is necessary. Using data from 46 studies, the current review compares the three medications used for opioid addiction, provides updates regarding new evidence, discusses the selection of an optimal treatment plan, and discusses unresolved problems associated with the medication-assisted treatment.

*Keywords:* opioid, addiction, medication-assisted treatment

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Opioids are a class of drugs that include prescription opioids, heroin, and fentanyl (Centers for Disease Control and Prevention [CDC], 2018a). Opioids act on opioid receptors of the nerve cell and produce various effects, including relief of pain, relaxation, and euphoria, which make opioids highly addictive and lead to opioid abuse, opioid overdose, and even death (National Institutes of Health, 2018). Opioid misuse often results in opioid use disorder (OUD). OUD is a mental illness recognized by the Diagnostic and Statistical Manual of Mental Disorders (DSM) as problematic opioid use, meeting two or more criteria that show clinically significant impairment within 12 months, such as unsuccessful efforts to reduce opioid use, craving opioids, repeatedly failing to fulfill major obligations due to opioid use, persistent interpersonal problems caused or worsened by opioid use, opioid use in dangerous situations, developing tolerance to opioids, and experiencing withdrawal (American Psychiatric Association [APA], 2013). The severity of OUD is rated as mild, moderate, and severe based on the number of criteria met, and the criteria are not considered met if the opioids are only taken under appropriate medical supervision (APA, 2013). OUD is closely associated with opioid overdose, which occurs after the intake of a high dose of opioids. Opioid overdose is a life-threatening

condition, as opioids act on the neurons of the brainstem that regulate breathing and can cause respiratory failure.

The United States (U.S.) is in the midst of an opioid crisis, which is directly related to the increased misuse of prescription opioids as pain relievers. People usually make a transition from using opioids as pain relievers to using heroin after their prescription opioid pain reliever is no longer available or becomes too expensive to afford. Data show that 80% of people who use heroin first abused prescription opioids (National Institute of Drug Abuse [NIDA], 2018a). A series of health issues including a surge of infectious diseases, especially HIV and hepatitis C, have been associated with the current opioid misuse crisis due to intravenous opioid use (Schwetz et al., 2019), escalating rates of accidental opioid overdose death (CDC, 2018b), and increased incidents of pediatric opioid ingestion (Kane et al., 2018). The rate of opioid overdose death continues to increase, and an average of 130 Americans die every day from an opioid overdose (CDC, 2018b). Additionally, maternal opioid use disorders have dramatically increased, and every 15 minutes, a baby is born in the United States suffering from opioid withdrawal (NIDA, 2019).

The American opioid crisis inflicts not only serious health concerns but also breeds devastating social and economic consequences. The financial burden of the opioid crisis was about 504 billion dollars, which was

2.8% of GDP in 2015 (Ryan, 2018). The increased cost of treatment, cost of lost productivity due to addiction and incarcerations, and cost of criminal justice system involvement all contribute to the current financial burden of opioid crisis (Ryan, 2018). Regarding the social aspect, common negative social impacts of the ongoing opioid crisis include an increased opioid-related crime rate and overcrowded foster care system, which occurs as more children are placed in a foster home because of parental opioid abuse (Swartz, 2018).

Taken together, identifying, developing, and providing effective treatment for OUD to combat the adverse health and socioeconomic impact associated with the opioid crisis is a national emergency. Currently, medication-assisted treatment (MAT) is one of the most effective treatments for OUD and is critical for reducing opioid-related fatalities (Scott et al., 2019). Common medications used in MAT include methadone, buprenorphine, and naltrexone, which the FDA approved for treating OUD (Oesterle et al., 2019). Although previous reviews of medication-assisted treatment of OUD provide a useful guideline to health care providers, keeping the information updated as new evidence emerges is necessary for the best treatment outcome. The purpose of this review is to compare current medication used in MAT of OUD, provide updates regarding new evidence, and discuss unresolved problems associated with the MAT of OUD.

## Methadone

### Background

Oesterle et al. (2019) review that methadone was historically used as a pain medication and was first used for opioid addiction treatment in a pilot study conducted among a group of 22 patients with heroin addiction in 1965. In that study, Dole and Nyswander (1965) found that patients with heroin addiction had significant improvement and were able to return to school and job after a comprehensive program with methadone. The result of this study showed that methadone dramatically decreased the craving of heroin and blocked the euphoric effects of heroin (Dole & Nyswander, 1965). Methadone was approved for opioid addiction treatment under the Narcotic Addict Treatment Act of 1974, but strict medical supervision is required (Oesterle et al., 2019).

Methadone is a synthetic, white, and water-soluble analgesic, which acts as a full  $\mu$ -opioid receptor agonist with a high affinity to the  $\mu$ -opioid receptor and is similar to morphine structurally. The binding of the  $\mu$ -opioid receptor affects the central nervous system and makes methadone share many similar effects of other opioids, including heroin, oxycodone, and morphine. Methadone displays a longer duration of action and half-

life when compared to other opioids, and exerts its effect more slowly than other opiates even though it activates the same opioid receptors. In this way, methadone helps to relieve drug craving and reduce withdrawal symptoms. However, methadone does not produce euphoria in opioid-dependent individuals thus it eliminates the reinforcing effects of opioids (NIDA, 2018b). Consequently, methadone becomes an ideal substitution of opioids for detoxification and maintenance in opioid addiction treatment (Drug Bank [DB], 2020a; Stotts et al., 2009). Furthermore, methadone also disturbs the major excitatory pain pathway within the central nervous system as an N-methyl-D-aspartate (NMDA) receptor antagonist, but the contribution of NMDA receptor antagonism to methadone's efficacy in opioid addiction remains unknown (DB, 2020a).

### Benefits

Methadone effectively reduced opioid misuse, and preliminary data demonstrated a consistent, statistically significant relationship between methadone maintenance treatment and the reduction of illicit opiate use (Marsch, 1998). A recent study further confirmed the efficacy of methadone in reducing illegal opiate use by the fact that methadone effectively reduces opioid craving, withdrawal, and reinforcing effects of other opioids (Connery, 2015). Due to the high efficacy of methadone in reducing opioid misuse, methadone maintenance treatment is currently the most effective treatment for severe and chronic opioid dependence (Stotts et al., 2009).

Methadone treatment is also associated with many social benefits, including reduced criminal behaviors and HIV risks. Gowing et al. (2006) compared the criminal behaviors between the criminal addicts with enrollment in the methadone program and the criminal addicts without admission in the methadone program. They found that the criminal addicts treated with methadone had a significantly lower conviction of new crimes than the criminal addicts without any treatment. This study indicated that methadone reduced illegal activities among addicts. On the other hand, the number of infectious diseases such as HIV and hepatitis tends to grow as opioid use increases due to intravenous drug injection (Schwetz et al., 2019). One review examined the data from 28 studies involving methadone and found that methadone maintenance significantly reduced drug injection and the sharing of syringes/needles (Gowing et al., 2006). This reduction of intravenous drug injection directly relates to lower HIV risks and links reduced HIV risk with methadone treatment.

## Risks

Several risk factors for methadone have been identified. They include high abuse liability, potential overdose, cardiac arrhythmia, and the incomplete cross-tolerance between methadone and other opioids. Incomplete cross-tolerance occurs when the use of one drug leads to the development of tolerance of another drug that is structurally similar. As a result, the starting dose of the new drug is often reduced to prevent overdosing. As methadone acts as a long-acting full  $\mu$ -opioid receptor agonist and mimics the effects of other opioids, tolerance and dependence can quickly develop after repeated use of methadone (DB, 2020a). Compared to the other opioid addiction medications to be discussed in this review, methadone has the highest abuse risks (Oesterle et al., 2019). One study found that 40% of the prescription opioid abusers misused methadone, which is often prescribed as pain medication (Rosenblum et al., 2007). As a result, this high abuse liability of methadone leads to significant controversy about the use of methadone for opioid addicts (Oesterle et al., 2019).

Another risk factor of methadone is potential overdose incidents, which are closely associated with increased methadone abuse. Since methadone is a synthetic opioid, excessive methadone use can cause severe respiratory depression and eventually death if the administration of methadone is not carefully monitored (DB, 2020a). Opioid overdose killed more than 47,000 people in 2017, and 36% of those deaths involved prescription opioids (Scholl et al., 2019). Methadone is one of the most common drugs involved in prescription opioid overdose deaths (CDC, 2018b).

The concurrent use of methadone and other medication may contribute to potential overdose incidents. As methadone is mainly metabolized by the cytochrome P450 in the liver, many drugs such as ciprofloxacin, fluconazole, and fluoxetine that inhibit P450 may interact with methadone, increasing the chance of unintentional overdosing of methadone (Treece et al., 2018). Additionally, many patients undergoing methadone maintenance are on high doses of methadone, with some on over 150mg daily, which is a much higher dose than the lethal dosage (70mg-75mg daily) for nontolerant individuals (Oesterle et al., 2019; Stotts et al., 2009). This high dose methadone use in treatment may also contribute the increased overdose incidents.

Cardiac severe arrhythmia is also one common risk factor of methadone and is often associated with high doses of methadone, especially when the dosage is over 200mg daily (DB, 2020a). Methadone can also induce QTc prolongation and life-threatening cardiac arrhythmia (Treece et al., 2018). Furthermore, another

study found that patients who regularly use methadone have the highest rate of sudden death among opioid-dependent patients with typical heart structure (Chugh et al., 2008). The fact that methadone is also an inhibitor of the cardiac ion channel may cause a dangerous, rapid heart rate and irregular cardiac rhythm that is assessed via QTc prolongation in a dose-dependent manner (Mujtaba et al., 2013, van Noord et al., 2010). The risk of fatal cardiac arrhythmia limits the utilization of methadone among patients who requires high doses of methadone.

The last common risk factor of methadone is the incomplete cross-tolerance between methadone and other opioids. Patients with tolerance to other opioids, more specifically, other  $\mu$ -opioid receptor agonists, may have incomplete tolerance to methadone. This incomplete cross-tolerance makes it challenging to determine the appropriate dosage of methadone when patients with tolerance to other opioids are switched to methadone treatment. Accordingly, death may occur during the switch from other opioids to methadone if the starting dose of methadone is higher than what the patients can tolerate (DB, 2020a).

## Administration

Current methadone products used in opioid addiction treatment approved by the FDA include Dolophine (methadone hydrochloride) tablets and Methadose (methadone hydrochloride) oral concentrate (FDA, 2019). The liquid form of methadone (Methadose) is often used in a methadone clinic for opioid addiction treatment. In contrast, the tablet form of methadone is the most common formulation used in pain clinics (Oesterle et al., 2019).

The administration of methadone is required to be strictly monitored by a methadone program or clinic. A screening procedure is needed for enrollment in a methadone program, and a patient must have a documented one-year history of opioid dependency to be qualified. After enrolling in a methadone program, patients usually begin with a daily dosage of 20-30mg, and the dosage is increased by 5-10mg each day until the optimal dosage is reached. Although the dosage needed varies in different patients, the adequate daily dosage usually ranges from 80-150mg, and lower doses are typically less effective (Stotts et al., 2009).

To minimize the abuse potential and safety risks, methadone clinics have strict regulations towards the administration of methadone. Patients are often required to attend the methadone treatment program for six days a week, with one take-home dose in the first three months of treatment. Once the patients prove their commitment to the methadone treatment program by

attending the treatment and following the instructions for three months, they are allowed to participate in the program three days a week with four take-home doses. After one year, patients are eligible for attending the program one day a week with six take-home doses. The methadone clinic often supervises patients' progress via urination drug screening during the treatment to prevent potential abuse. This strict regulation seems to be effective because more methadone overdose death is strongly tied to illicit methadone use than methadone clinic use (Oesterle et al., 2019).

## **Buprenorphine**

### **Background**

Buprenorphine was first discovered in 1966 by John Lewis (Oesterle et al., 2019). After the FDA approved buprenorphine for opioid addiction in October of 2002, it has been commonly used as an alternative to methadone for severe opioid addiction (Stotts et al., 2009).

Unlike methadone, a full  $\mu$ -opioid receptor agonist, buprenorphine acts as a partial  $\mu$ -opioid receptor agonist with a high affinity for the receptor antagonist (Oesterle et al., 2019). As a partial  $\mu$ -opioid receptor agonist, buprenorphine competes with other opioids for the binding receptors and replaces the lower affinity opioids without fully activating the receptors. Consequently, buprenorphine has a slow onset, longer duration of action, and ceiling effects, which is a phenomenon in which buprenorphine's effects decrease once a certain dose is reached. Since buprenorphine is a partial  $\mu$ -opioid receptor agonist, patients do not experience euphoria at the same rate as the other more potent opioids (DB, 2020b).

### **Benefits**

Buprenorphine is often used in agonist replacement therapy, which effectively reduces heroin intake (Jordan et al., 2019). Previous evidence showed that patients given buprenorphine requested fewer dose changes and used less illicit opioids than patients given a placebo (Johnson et al., 1995). This result was consistent with a randomized, double-blind, 12-week study, which found that patients receiving buprenorphine have significantly larger decreases in reported opioid use when compared to the patients receiving placebo (Krook et al., 2002). More importantly, another study reviewed the controlled trials, meta-analysis, and large observational studies on buprenorphine from 1980 to 2009. They concluded that buprenorphine is a safe and effective treatment for opioid addiction (Kahan et al., 2011).

Another benefit of buprenorphine is its lower abuse liability and fewer overdose incidents compared to

methadone (Barnett et al., 2001). Buprenorphine is a partial agonist and causes euphoric effects to plateau once a certain dose is reached, which reduces the risk of unintentional overdose relative to full agonist medications such as methadone. Preliminary data showed that single doses of buprenorphine up to 70 times the recommended dose are well tolerated by nondependent individuals (Walsh et al., 1994). These partial agonist properties of buprenorphine are associated with not only reduced risk of overdose but also other benefits. One study found that the partial agonist properties of buprenorphine reduce the risks of potential abuse and withdrawal symptoms. To further minimize abuse liability and reinforcing effects of buprenorphine, buprenorphine can combine with naloxone at a 4:1 ratio, which is also commercially known as Suboxone (Stotts et al., 2009). Jordan et al. (2019) found that this combination of buprenorphine and naloxone significantly reduces opioid craving, withdrawal symptoms, and relapse.

In addition, buprenorphine can be prescribed by primary care physicians, while methadone can only be prescribed in a methadone clinic. The use of buprenorphine in primary settings improves patients' access to effective treatment for opioid addiction and reduces social harm (Stotts et al., 2009).

### **Risks**

Despite its relative efficacy, safety, and easy access in the treatment of opioid addiction, buprenorphine has been linked with several risk factors. Limited maximum efficacy of buprenorphine due to its partial agonist properties is one of the risk factors (Stotts et al., 2009). This study showed that the maximal effects of buprenorphine at doses ranging from 4 to 8mg have no greater effect than the higher dose. On the other hand, the methadone dose-effect curves were linear across the range of doses tested (Walsh et al., 1995). As a result, buprenorphine may not be as effective in treating patients with severe opioid addiction.

Another concern with buprenorphine is its potential abuse liability. Although buprenorphine has lower potential liability than most full opioid agonists such as methadone, the abuse of buprenorphine has been increasing due to the increased use of buprenorphine (Oesterle et al., 2019). Yokell et al. (2011) demonstrated that buprenorphine produces euphoric effects in non-opioid dependent individuals and has positive reinforcement properties like other opioids. Nevertheless, another study argued that the abuse liability of buprenorphine is low in heroin-dependent individuals possibly due to its weak reinforcing effects caused by the



longer duration of action of buprenorphine compared to other medications (Comer et al., 2008).

Another challenge with buprenorphine is its poor tapering outcome. In a 14-week randomized clinical trial comparing the outcome between the patients on buprenorphine maintenance therapy and the patients on buprenorphine taper therapy, taper therapy, in which the dosage of opioids is reduced slowly to prevent significant withdrawal symptoms, was less effective than maintenance therapy in patients who received buprenorphine in primary care for the treatment of opioid addiction (Fiellin et al., 2014). Therefore, buprenorphine taper should not be used regularly in primary care.

### **Administration**

Buprenorphine must be dissolved sublingually due to its poor bioavailability when taken orally (Oesterle et al., 2019). Common FDA approved buprenorphine medications include combination product Suboxone (buprenorphine and naloxone) sublingual film of tablet, and mono-product Subutex (buprenorphine) sublingual tablet (FDA, 2019). The mono-product contains 2mg or 8mg buprenorphine, while the combination produce contains 2mg or 8mg buprenorphine and 0.5mg or 2mg naloxone, respectively (Ling, 2012).

A screening procedure is required before the initiation of buprenorphine treatment, and physicians need to make a diagnosis of opioid dependence and thoroughly review the risks and benefits of the treatment. Patients usually are required to abstain from opioids for at least 12 hours before the induction of buprenorphine. For induction, patients often begin with 2-4mg after at least 12 hours abstinence, and physicians may increase the dose by 2-4mg every 2 hours as needed for withdrawal symptoms with a dose of up to 8-16mg on the first day, 8-16mg on the second day and 12-24mg on the third day. Buprenorphine is also effective when taken three times a week, but it is often administered once or twice a day (Ling, 2012). The average dose of buprenorphine is 16mg daily, and the recommended maximum sublingual dose is 24 or 32mg daily (Stott et al., 2009; Oesterle et al., 2019).

## **Naltrexone**

### **Background**

Naltrexone was first synthesized in 1963 by Dr. Harold Blumberg at the Long Island-based Endo Laboratories and purchased by DuPont Pharmaceuticals in 1969. Later in 1984, the FDA approved naltrexone as a non-addictive treatment for opioid addiction. Naloxone is similar to naltrexone, but naloxone was first synthesized in 1961 by Drs. Jack Fischman and Mozez Lewenstein of

the Memorial Sloan Kettering Institute for Cancer Research based on Dr. Harold Blumberg's proposal that a novel drug, similar to Naltrexone, but that would take effect faster might exist. Although both naltrexone and naloxone block the effects of opioids, naloxone is commonly used to reverse an opioid overdose, while naltrexone is often used for opioid dependence treatment (Srivastava & Gold, 2018).

Unlike methadone and buprenorphine, which are both opioid agonists, naltrexone is a pure opioid antagonist. It acts as a competitive antagonist at the  $\mu$ -opioid receptor in the central nervous system, with high affinity for the  $\mu$ -opioid receptor. As naltrexone actively binds to the  $\mu$ -opioid receptor, it blocks the effects of opioid agonists, including respiratory depression, euphoria, and drug craving (DB, 2020c). Compared to naloxone, naltrexone has greater potency, longer duration of action, and more oral bioavailability (Oesterle et al., 2019).

### **Benefits**

Research has demonstrated that Naltrexone is effective for treating opioid addiction when patients comply with the treatment plan. Johansson et al. (2006) performed a meta-analysis that included fifteen studies with 1,071 patients to determine the efficacy of naltrexone in reducing opioid use and the role of treatment retention. The authors found that naltrexone was much more effective than control in reducing opioid use in the high retention subgroup, and concluded that retention was necessary for the effect of naltrexone in treating opioid addiction. This finding was consistent with the results of a previous study. Navaratnam et al. (1994) conducted a double-blind clinical experiment to evaluate the efficacy of naltrexone among thirty-eight adult males by assigning subjects to receive an intravenous injection of heroin or placebo after the naltrexone dose. Physiological and subjective parameters were measured, and the result indicated that naltrexone was effective in blocking the physiological and psychological effects of heroin for at least 48 and 72 hours, respectively. However, this particular study may not be representative since all participants were Asian.

Another benefit of naltrexone is that it has little or no potential tolerance and dependency when compared to the other opioid medication since naltrexone is an opioid antagonist (Stotts et al., 2009). Naltrexone blocks the effects of many opioid agonists, including euphoria, so it does not have any reinforcing effects like the other opioid agonists do. This lack of positive reinforcement of naltrexone makes it impossible for patients to become addicted to it. Since many medications used in opioid addiction are addictive, this

nonaddictive property of naltrexone becomes one of its apparent advantages compared to methadone and buprenorphine.

Furthermore, naltrexone can serve as a deterrent to combat overdose and abuse because naltrexone is an opioid antagonist, which has the opposite functions as the opioid agonist such as methadone and buprenorphine (Oesterle et al., 2019). Normally, the opioid agonists like methadone and buprenorphine activate the  $\mu$ -opioid receptor, which causes disinhibition of the dopaminergic neurons, thus leading to the increased dopamine release in the striatum, a critical brain structure for the neural reward pathway and experience of euphoria (Bull et al., 2017). In general, using opioid antagonists like naltrexone together with opioid agonists are not recommended due to their opposite effects. However, some studies found the co-treatment of naltrexone and opioid agonists could be beneficial. Carin and Shen (1990) discovered a paradoxical effect of enhancing opioid analgesia and reducing dependence when an ultra-low dose of antagonist like naltrexone is used with other opioid agonist. Backonja et al. (2016) performed a randomized, double-blind, placebo-controlled, three-way crossover study to determine the abuse potential of intravenous oxycodone combined with naltrexone, compared with intravenous oxycodone in nondependent, recreational opioid users. They concluded that the combination of intravenous oxycodone and naltrexone led to significantly lower abuse potential than intravenous oxycodone alone in nondependent, recreational opioid users. This study demonstrated the benefit of naltrexone to reduce abuse liability. However, other studies found conflicting results. One double-blind, placebo-controlled study found the addition of an ultra-low-dose of naltrexone to oxycodone did not reduce abuse liability of opioid abusers (Tompkins et al., 2010). Another study found the benefit of such combination was inconsistent (Burns & Wang, 2010). As a result, the combination of opioid agonists and opioid antagonist remains controversial and its mechanism of actions needs further investigation.

Unlike opioid agonist medications, naltrexone has few side effects. As mentioned above, methadone can lead to fatal cardiac arrhythmia, which has not been observed among patients who used naltrexone (Stotts et al., 2009).

### Risks

Despite the benefits associated with naltrexone, several risk factors have been identified. One risk factor is that discontinuation of naltrexone may lead to increased fatal overdose incidents. Although naltrexone has been used to prevent overdose, this prevention of overdose is

effective only when naltrexone is taken promptly after the potentially fatal overdose of the opioid is administered. One study conducted a retrospective case review of the extended-release injectable naltrexone (Vivitrol) on 52 fatal overdoses and found that 84.6% of those fatal overdoses occurred within two months of the last Vivitrol injection. This result suggested that there is a potential link between the fatal overdose and the discontinuation of naltrexone (Saucier et al., 2018).

Another risk factor of naltrexone is patients' poor compliance with the treatment. Preliminary data showed that most patients failed to take naltrexone regularly, and this poor compliance of the medication directly related to poor treatment outcomes. Consequently, naltrexone is much more effective among patients who are highly self-motivated and committed to the treatment plan. Johansson et al. (2006) found that naltrexone is more effective than control in reducing opioid use only in the high retention subgroup and concluded that high treatment retention was required for the effect of naltrexone in treating opioid addiction. One study showed that the poor compliance of naltrexone is related to the lack of incentive to continue this medication because naltrexone has little reinforcing effects when compared to other opioid addiction medications (Oesterle et al., 2019). Thus, improving patients' compliance becomes one of the biggest challenges of naltrexone.

Additionally, some studies argue that naltrexone might lead to acute hepatitis or liver failure, however, there is little direct evidence of this risk (McDonough, 2015). Marrazzi et al. (1997) investigated the effects of high dose naltrexone on liver function by measuring liver function parameters in response to high doses of naltrexone using a double-blind experiment. The results showed that no adverse clinical changes in liver function occur due to high dose naltrexone, even though the liver enzyme level increased. Most cases of liver failure occur when naltrexone is used to treat alcohol dependency, and a few cases of liver failure have been reported when naltrexone is used for opioid addiction treatment. Further evidence is needed to determine whether a liver failure is a risk factor of naltrexone.

### Administration

Naltrexone acts as a long-acting opioid antagonist with a high affinity to the  $\mu$ -opioid receptor. The administration of naltrexone often starts with 25mg daily, and then increases to 50mg daily, which is the standard dosage for opioid addiction. A typical daily dose of 50mg naltrexone will block the pharmacologic effects of 25mg IV heroin for 24 hours, a 100mg naltrexone for 48 hours, and a 150mg naltrexone for 72 hours (Kleber,

1985). However, the daily dosing of naltrexone has been associated with poor compliance because patients need to take naltrexone voluntarily every day to remain opioid-free. Two methods have been developed to improve compliance.

The first method is to change daily doses to three doses a week. Instead of taking naltrexone every day, patients are given 100mg naltrexone on both Monday and Wednesday, and 150mg naltrexone on Friday. This method appeared to improve compliance because patients did not have to decide to take the naltrexone every day (Kleber, 1985). The second method is to change the daily formulations to long-acting “depo” formulations, which is also called extended-release injectable naltrexone (XR-NTX). XR-NTX is also known as Vivitrol, and the FDA approved it for opioid addiction treatment. Compared to the traditional naltrexone, which is taken orally daily, XR-NTX is injected once a month in a clinic and gives a relatively constant level of naltrexone to the patients (Oesterle et al., 2019). A pilot study was conducted to test the ability of XR-NTX to treat and retain opioid-dependent offenders in 5 sites. A total of 61 opioid-dependent individuals received six-monthly injections of XR-NTX and completed a six-month follow-up interview. The result showed that the patients who completed treatment had significantly less opioid use and a lower incarceration rate than the patients who failed to complete the treatment (Coviello et al., 2012).

Even though XR-NTX seems to be a promising and effective option for opioid addiction treatment, its efficacy is limited by low adherence. Jarvis et al. (2018) reviewed 34 studies on extended-release naltrexone (XR-NTX). They concluded that XR-NTX appeared to reduce opioid use, but it had a low adherence rate and a higher success rate in patients already detoxified from opioids. As a result, initial inpatient detoxification before the treatment of naltrexone is often required.

### Other medication

Other than the three main medications (methadone, buprenorphine, and naltrexone), some other drugs such as alpha-2-adrenergic agonists have been used to manage opioid withdrawal symptoms (Stotts et al., 2009). Alpha-2-adrenergic receptor agonists have been used for decades to treat hypertension, attention-deficit/hyperactivity disorder, various pain and panic disorders, opioid withdrawal, and alcohol withdrawal. Biologically,  $\alpha$ -2 agonists produce effects within both the central and peripheral nervous systems and moderate the symptoms of noradrenergic hyperactivity, which is a process underlying opioid withdrawal. Additionally,  $\alpha$ -2 agonists can provide sedation, analgesia, and euphoric effects and block the

acute withdrawal symptoms partially in patients with opioid use disorders (Giovannitti et al., 2015).

Clonidine was the first  $\alpha$ -2 agonist discovered to relieve the withdrawal symptoms of opioids, and recently has been used to treat anxiety (Stotts et al., 2009). Anxiety can be induced by stress, which is closely related to the opioid craving in patients with opioid use disorders. One article examined stress and its relationship to opioid use, opioid craving, and treatment outcomes by reviewing 21 studies, considering stress may contribute to inadequate medication-assisted treatment (MAT) retention (MacLean et al., 2019). MacLean et al. (2019) found that elevated stress with opioid use disorder was associated with greater opioid craving and suggested that pharmacological treatment target stress may increase MAT retention and decrease relapse. As a result, clonidine can be an effective medication to manage withdrawal symptoms by reducing stress and anxiety. On the other hand, clonidine lowers systemic blood pressure and is frequently used in the management of hypertension. This property limits the use of clonidine due to significant hypotension side effects (Giovannitti et al., 2015).

Other  $\alpha$ -2 agonists, such as lofexidine has been frequently studied in the hope of replacing clonidine. Preliminary data showed that lofexidine had little hypotension side effects compared to clonidine, and lofexidine can a feasible approach to replace clonidine (Stotts et al., 2009).

Another drug commonly used for opioid withdrawal in the past was Levomethadyl acetate (LAAM). LAAM and methadone are both full  $\mu$ -opioid receptor agonists and reduce opiate dependency effectively (Clark et al., 2002). Compared to methadone, LAAM has a longer duration of action, which allows 2-3 times a week dosing, while methadone requires daily dosing (Clark et al., 2002). LAAM is typically administered on a Monday-Wednesday-Friday schedule, starting with a daily dosage of 20mg (Stotts et al., 2009). It is not sold in the United States currently because it has been withdrawn from the market following a few cases of life-threatening cardiac arrhythmias and QTc prolongation. Nonetheless, no direct evidence shows that there is a significant difference between LAAM and methadone on cardiac risks (Clark et al., 2002).

Clark et al. (2002) performed a meta-analysis comparing the efficacy of LAAM and methadone maintenance for heroin dependence using data from eighteen studies. The result showed that there was no difference in safety outcomes between the two medications, and LAAM appeared more effective than methadone at reducing heroin use. Also, most patients

who experienced both LAAM and methadone preferred LAAM as it provided a smoother duration of action. However, LAAM patients stopped taking LAAM more than methadone patients stopped taking methadone, and the reason for this phenomenon remains unknown.

### **MAT in special populations**

#### **MAT in adolescents**

The current opioid crisis in the U.S. affects not only adults, but also adolescents. In 2016, 3.6% of American adolescents ages 12 to 17 years and 7.3% of emerging adults ages 18 to 25 years misused an opioid. Prescription opioids are the most commonly misused opioids among adolescents, and a total of 153,000 adolescents (0.6%) met the criteria for opioid use disorder (OUD) in 2016 (Yule et al., 2018). To combat this crisis, seeking effective treatment for adolescents with OUD is essential.

Treatment for adolescents with OUD includes medication, therapy, family, and community support. Medication-assisted treatment (MAT) has been one of the most recommended ways of treating opioid addiction in adolescents due to the risks of overdose. Although the FDA approved three medications for the treatment of opioid addiction in adults (methadone, buprenorphine, and naltrexone), only buprenorphine and naltrexone have been frequently studied since methadone is rarely used in adolescents in the U.S. (Yule et al., 2018). Previous evidence suggested that the MAT used in adults can be used in adolescents with similar efficacy. Smyth et al. (2018) measured changes in drug use among adolescents receiving opioid substitution treatment and outcome during the first 12 months of the treatment. The authors found that heroin-dependent adolescent patients reduced heroin use significantly within the first three months of treatment, and the improvement continued after a year. This study concluded that medication-assisted treatment had similar efficacy in reducing opioid use in adolescents as compared to adults.

Compared to MAT for adults with OUD, MAT for adolescents with OUD often required additional documents before the initiation of the treatment. The Drug Enforcement Administration (DEA) waiver is required for the use of buprenorphine/naloxone in adolescents, and written parental consent is needed for the use of methadone in adolescents.

#### **MAT in pregnant women**

Under the opioid crisis, maternal opioid use disorders also dramatically increased, and every 15 minutes, a baby is born suffering from opioid withdrawal (NIDA, 2019). To reduce the risk of pregnancy complications, MAT is effective and recommended for

pregnant women with OUD. Common medications used for pregnant women with OUD include methadone and buprenorphine, and it appears that these two medications have similar efficacy and risk levels for treating OUD in pregnant women. Zedler et al. (2016) conducted a meta-analysis of eighteen studies to compare the safety of buprenorphine with the safety of methadone as a treatment for pregnant women with opioid use disorder. The authors found no treatment differences for safety concerns and concluded that buprenorphine treatment of maternal opioid use disorder during pregnancy was not linked with higher risks than methadone treatment.

Although MAT is effective for treating OUD in pregnant women, over 44% of pregnant women received no MAT between 2009 and 2015. The prevalence of methadone use decreased from 31.6% in 2009 to 25.2% in 2015, while the prevalence of buprenorphine use increased from 15.8% to 30.9% according to a retrospective study using Pennsylvania Medicaid administrative data. In sum, the buprenorphine use among Medicaid enrolled pregnant women with OUD increased significantly over time, but methadone use declined (Krans et al., 2019). The reason behind this trend remains unknown, but it may be caused by the increased access of primary care MAT to pregnant women.

### **Discussion**

Overall, MAT significantly reduces opioid abuse and craving and relieves opioid withdrawal symptoms. All three FDA approved medications (methadone, buprenorphine, and naltrexone) for MAT are effective based on current evidence. How to select the treatment with MAT for the patient with OUD becomes an important question, which can be answered from an individualized standpoint and public standpoint.

From an individualized standpoint, many factors should be taken into consideration, including accessibility of treatment options, safety concerns, prior medication history, motivation, and social environment for an individualized care plan. The access to treatment differs among the three medications; buprenorphine and naltrexone are more available than methadone because buprenorphine and naltrexone can be given in a primary care setting, but methadone is only offered in a methadone clinic. Patient preference for treatment options and location should be considered as well, since patients may have a different preference based on their culture and possible stigma associated with particular medication such as methadone.

Other than the access to treatment options, safety concerns and prior medication history should be

thoroughly reviewed to minimize the risk factors. Providers should consider possible comorbid medical and psychiatric conditions. For instance, a patient with co-occurring alcohol use disorder and OUD may benefit the most from opioid antagonist therapy, such as naltrexone, because naltrexone has also been approved by the FDA to prevent relapse to alcohol misuse. However, methadone or buprenorphine should be the first consideration if the patient is pregnant or has chronic pain. Patient motivation for quitting should be assessed as well. If the patient is highly motivated, antagonist therapy is preferred despite its low adherence compared to agonist therapy. The patient's strong motivation may compensate for the poor overall retention rate associated with antagonist therapy. On the contrary, agonist therapy is recommended when the patient's motivation is low because agonist therapy shows the highest patient retention rates across all studies.

Agonist therapy includes both methadone and buprenorphine; selecting between the two medications requires a detailed discussion with the patient. Several studies compared the two drugs. Kinsky et al. (2019) examined the adherence, outcomes, and cost of opioid use disorder patients treated with buprenorphine and methadone using Medicaid claims data. The result showed that elderly patients and women had a significantly lower risk of non-adherence, and that non-adherence to methadone was associated with significant increases in the total cost of care. Another study compared the effectiveness of buprenorphine and methadone using the data from five randomized clinical trials (Barnett et al., 2001). The result showed that 8-12mg/day dose buprenorphine was more effective than low dose methadone (20-30mg/day) but less effective than high dose methadone (50-80mg/day). The difference between buprenorphine and methadone was small in both studies, and no long-term studies have compared the taper outcomes between buprenorphine and methadone. Which treatment is more effective for opioid addiction remains unknown, and more research is needed for a more conclusive answer.

The social environment of patients is often overlooked, but it can affect the treatment outcome. For example, patients with extensive drug-using networks, drug-related legal charges, and socially disadvantaged patients may benefit from intensive social services in addition to MAT to maximize the treatment outcomes.

From a public standpoint, public health impact should be taken into consideration in addition to individual preferences. Patients who have a recent history of opioid diversion or overdose may be better served through placement in a structured inpatient care setting

such as mental health clinic instead of a primary outpatient care setting. This can minimize the potential danger imposed on patients themselves while they begin their sobriety and others in the community through crime and transmission of infectious diseases such as HIV and hepatitis. To further relieve the public health concern of opioid overdose, all patients with OUD and their family members should be provided with basic education about overdose, and patients should have naloxone in their possession to treat a fatal overdose.

Generally speaking, all three primary medications used in MAT have benefits and risks, and each offers some advantages over the others depending on the patients' situations. An individualized, comprehensive evaluation is required for each patient. There is no perfect MAT for treating opioid addiction, each have some negatives and none address the full context of an individual's addiction. To optimize treatment outcome, a collaborative treatment plan including both MAT and nonmedical treatment, such as behavioral therapy, should be developed for managing withdrawal symptoms and preventing future relapse.

### **Future directions**

Given the comprehensive overview of the current MAT for opioid addiction, several recommendations are given for future direction. First, more research is needed to understand the efficacy of MAT in nondependent patients with opioid addiction. Most of the current studies examined the MAT in patients with physical dependence symptoms. However, impulsive patients may misuse opioids even without being physiologically dependent on the opioid. Logically, opioid antagonist therapy, such as naltrexone, may be favored compared to opioid agonist therapy, which may induce opioid dependency. Also, the medications that decrease patients' impulsivity can be incorporated into the treatment to control opioid misuse behavior.

Another recommendation for future research is to investigate novel community service programs that increase the accessibility of the MAT. One challenge in the opioid crisis is the limited access to medication-assisted treatment. One study demonstrated that the evidence-based medical treatment in the U.S. and Canada was limited due to inadequate treatment access, restriction on office-based methadone treatment, and the high cost of treatment (Nosyk et al., 2013). To improve the public access of MAT, a few models have been tested in the community recently. Ashford et al. (2019) presented a new model of pharmacotherapy: The Recovery Community Center Office-Based Opioid Treatment model (RCC-OBOT). The RCC-OBOT model included two event scenarios (Overdose event and Non-

overdose event) and incorporated elements from community organizations that utilize both MAT and peer support service like narcotics anonymous meetings, office-based opioid treatment programs, emergency department buprenorphine induction programs, and low-threshold treatment programs. The new model aims to address current barriers to OUD treatment, including patient access, program capacity, and a lack of individual demand for OUD pharmacotherapy.

In addition to novel community service programs, timely accommodation of current treatment programs based on emerging evidence should be stressed in future research. For instance, the incorporation of medication treatments into local 12-step based treatment programs has effectively increased the accessibility of MAT, but most 12-step based treatment programs still resist MAT. Klein and Seppala (2019) demonstrated the resistance many 12-step based treatment programs have with the use of medication due to philosophical conflicts and studied a combination of OUD specific group therapy and the use of medication with standard 12-step based treatment program. The result showed that the incorporation of medication within the context of 12-step based treatment was associated with a better outcome when the medications were taken as prescribed. Although these few new or adjusted models have been tested recently, more future research is needed to improve the accessibility of MAT.

Lastly, future research on MAT should focus on the development of non-opioid treatment. The development of non-opioid therapy is possible through a better understanding of the neurobiological interaction with opioid addiction pathways. Many current medications used in MAT are opioids themselves, and it is controversial to replace one opioid with another opioid because of the addictive potential of opioids. The addictive properties of opioid treatment may be associated with a wide range withdrawal symptoms including treatment-resistant anxiety, severe opioid craving, and contribute to high relapse and dropout rate. Novel non-opioid treatment may improve retention rate and relieve treatment-resistant withdrawal symptoms.

## Conclusion

There are multiple effective medications available for the medically assisted treatment of opioid use disorder. Methadone remains the most effective drug in treating severe opioid dependence due to its high efficacy in reducing opioid withdrawal and reinforcing effects. However, methadone is associated with the highest abuse liability compared to the other drugs, which limits its practicality. Buprenorphine is effective in treating mild to moderate opioid dependence due to its

weaker efficacy compared to methadone, but buprenorphine is generally safer than methadone because of its lower abuse liability and fewer overdose incidents. Lastly, naltrexone can be used to reverse opioid overdose and has little potential dependency and side effects compared to methadone and buprenorphine, but has limited efficacy due to poor compliance with treatment. Society and individuals would benefit from increased accessibility to treatment with these drugs as well as availability to access the particular drug that may be most effective for each individual's needs.

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## THE EFFECT OF AUTHORITARIANISM AND MORTALITY SALIENCE ON SUPPORT FOR DONALD TRUMP

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**Abstract** – This research examined how authoritarianism and mortality salience influence support for Donald Trump. Authoritarians prefer the traditional way, obey authority figures, and often are aggressive to out-groups, particularly those who are nontraditional and are critical of authority figures. Mortality salience is the awareness of the inevitability of one's death. Participants from a nationwide online sample ( $N = 207$ ) completed measures of authoritarianism, death-related or pain-related anxiety, and support for Donald Trump. It was hypothesized that there would be a positive correlation between authoritarianism and increased support for Donald Trump. As predicted, authoritarianism was positively correlated with support for Donald Trump. It was also hypothesized that participants for whom death-related anxiety was made salient would evaluate President Trump more favorably than participants for whom pain-related anxiety was made salient. Contrary to past research (Cohen et al., 2017b), death-related anxiety did not increase support for Mr. Trump. Lastly, it was hypothesized that there would be an interaction between authoritarianism and death-related anxiety that would lead to increased support for Donald Trump. Specifically, it was predicted that following mortality salience, the magnitude of increased support for Donald Trump would be greater for high authoritarians than for low authoritarians. The results did not support this hypothesis. The limitations of the study and potential directions for future research are discussed.

*Keywords:* authoritarianism, mortality salience, terror management theory, political preferences

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Most well-known for his T.V. show *The Celebrity Apprentice*, Donald Trump announced his plan to run for president in June 2016. The 2016 Republican primary election marked the beginning of Donald Trump's run to be the leader of the U.S. It also became clear that he had quite a following. Thousands of people attended Trump rallies wearing "Make America Great Again" paraphernalia. As Bloom (2017) noted, Donald Trump has touched the hearts of millions with his slogan "Make America Great Again" because his supporters want to recapture the past. Bloom (2017) writes about the moments to which many Americans would like to return:

When the Allies had won the big war, the economy was thriving, we still had productive factories, our infrastructure was being built or was sound, black people stayed in their place, gay people remained hidden, women stayed home,

had babies, and shut up, and the pace of change wasn't nearly as rapid as it is today (p.2).

During this time in history, patriarchy was not being significantly challenged by any group. People who support Mr. Trump feel a power shift has taken place. The narrative is now they are losing their jobs to immigrants, and the government is allowing terrorists into the country. The only person able to resolve these issues was Republican candidate Donald Trump. He promised to "Make America Great Again" by revitalizing the economy, deporting immigrants, building a wall to secure the southern border, and enacting a Muslim ban (Cohen et al., 2017a).

Over the past few years, psychologists and political scientists have researched the causes behind Trump's victory in the 2016 Presidential election. A single

factor cannot explain how Trump gained the support of millions of people, but his popularity among many voters can be attributed to various factors. The current research focuses on three highly interrelated characteristics central to understanding the social-psychological analysis of Trump's rise: authoritarianism, Terror Management Theory, and mortality salience. The first section provides an overview of the research on authoritarianism. Authoritarianism refers to the favoring of absolute obedience, traditional values, and hostility toward out-groups. The second section explores Terror Management Theory and its relationship with political preference. Terror Management Theory focuses on the effects of mortality salience, awareness of the inevitability of one's death.

### **Authoritarianism**

Supporters of Mr. Trump tend to score high on measures of authoritarianism. Bakker, Roodujin, and Schumacher (2016) describe authoritarians as people that prefer social order, prefer hierarchy, and are triggered by fears. Whitley (1999) notes that right-wing authoritarianism (RWA) stems from stories ingrained in individuals through authority figures. Trump constantly tells his supporters that other nations are a threat and immigrants are the reason for increased crime rates in the U.S. to the point where it becomes their reality. His speeches constantly remind people of the potential dangers that out-groups pose to them. MacWilliams's (2016a) survey of South Carolina Republican voters determined authoritarianism was one of two variables that were statistically significant predictors of support for Mr. Trump. The second variable measured was the personal fear of terrorism. Mr. Trump's name and campaign have become associated with issues important to authoritarians: immigration and terrorism. He has been able to connect with authoritarians by exaggerating the percentage of immigrants who commit acts of terrorism.

### **Perceived Threat**

Twitter has allowed police agencies around the world to keep citizens updated and engaged within their environments (Van de Velde et al., 2015). In addition to informing the public of relevant information, researchers have found that police departments can increase their perceived legitimacy simply by using Twitter as a medium to communicate with citizens (Grimmelikhuijsen & Meijer, 2015). Despite the promising interactions that can ensue between police department Twitter accounts and the public, there have also been negative interactions between these two parties. For example, in 2014, the New York Police Department Twitter account asked users to use the hashtag "#MyNYPD" to inform the NYPD of

important events occurring in their policing areas. Responses to this hashtag varied; however, the majority of the interactions with this tweet were negative and disclosed the maltreatment of individuals by officers (Grimmelikhuijsen & Meijer, 2015).

### **Terror Management Theory**

Terror Management Theory (TMT) is based on the work of Ernest Becker, a cultural anthropologist. Becker was interested in understanding people's reasoning behind their behavior. TMT assumes that all animals, including humans, have an innate drive toward self-preservation. A central tenet of Terror Management Theory is that, unlike other species, humans can develop abstract thinking and self-reflection. These abilities make human beings capable of recognizing that one's death is inevitable and can occur at any time for reasons that cannot be anticipated or controlled.

When people think about the inevitability of their own death, they experience an aversive emotional state known as mortality salience (Cohen, Solomon, & Kaplin, 2017). TMT is based on the idea that when people are faced with mortality salience, they rely heavily on their cultural worldviews (Greenberg & Kosloff, 2008). These worldviews usually encourage people to believe that the world has meaning and a purpose in life. For example, in many religious traditions, adherents believe in literal immortality, like heaven or reincarnation. There is a sense that after death, the spirit can live on. Then there is symbolic immortality, which means that one's existence prevails by having children, achievements in society, or identifying with larger groups or causes. These specific perspectives reduce anxiety by keeping individuals from dwelling on thoughts of one's death. Terror management theory, as it applies to political preferences, implies that people will align with the candidate advocating their worldviews, regardless of political party affiliation, when mortality salience is present.

Several studies in TMT hypothesize that if cultural worldviews and self-esteem protect people from being concerned about their death, then reminders of death should motivate people to affirm faith in their culture and strive to feel like a contributor to it (Greenberg & Kosloff, 2008). TMT is supported by research on the effects of reminders of death on faith in one's worldview, the pursuit of self-esteem, and the impact of threats to one's cultural worldview (Cohen, Solomon, & Kaplin, 2017). Weise et al. (2008) summarized the data for over 350 studies that support TMT by the following effects:

- Mortality salience produces adverse reactions to those who threaten the individual's worldview

and positive responses to individuals with the same worldview.

- Agreement with one's worldview by others or increased self-esteem serves as a buffer against the threat posed by mortality salience.

When death-related ideas are present, there is an increase in prejudice, stereotyping, and discrimination. Contrarily, people try to connect with those who share their worldview to feel safe from death-related ideas.

### **Mortality Salience and Political Preferences**

When the terrorist attacks on September 11 led Americans to contemplate their mortality, both liberals and conservatives responded similarly. George Bush saw an increase in support after the terrorist attack took place, after years of low approval ratings before the attack (Landau et al., 2004). Bush was able to rally people from different political backgrounds together under one specific theme, "protect our nation." Like Mr. Bush, Mr. Trump has used this same political strategy to rally support for his political agenda to rid the U.S. of immigrants and protect its citizens from terrorist attacks. This study provided evidence to support the claim that when people are faced with mortality salience, they gravitate towards decisive leaders who promise to protect them from evildoers.

Trump has taken advantage of people's ability to understand that death is out of their control. Mortality salience increases Americans' support for Donald Trump. In a study by Cohen, Solomon, and Kaplin (2017), after participants were exposed to reminders of death, there was a slight shift in favorable attitudes towards Donald Trump but not for Hillary Clinton. The results indicated that support for Hillary Clinton was unchanged when mortality was salient. In a New Hampshire Republican primary voters survey, John Broder (2016) found that many Republicans remarked that Trump was "the best candidate to handle international crisis" compared to everyone else running. Nine in 10 said they were apprehensive about another terrorist attack occurring. When voters are concerned with the chance of dying from a terrorist attack, they experience mortality salience, which increases their levels of support for a charismatic and decisive leader who they believe will save them.

Threats to shared worldview increase mortality salience. Mortality salience leads to heightened hostility towards out-groups, which creates an environment for charismatic leaders like Mr. Trump to provide meaning, value, and security (Cohen, Thompson, et al., 2017). These types of political candidates make voters feel essential and needed (Cohen, Thompson, et al., 2017). Because the terrorist attacks on 9/11 increased death-related anxiety among a vast majority of Americans, this

event was a "real-life mortality salience induction" (Cohen, Solomon, & Kaplin, 2017, p. 350) After 9/11, Landau et al. (2004) found that support for George Bush increased when people were exposed to 9/11 reminders. This increased support for Mr. Bush following 9/11 reminders occurred among people from different political backgrounds. After mortality salience inductions (Landau, 2004, Study 1) and 9/11 reminders (Landau, 2004, Studies 2 and 3), support for George Bush increased for people who considered themselves conservative and for people who considered themselves liberal. After 9/11, George Bush began to be seen as a charismatic leader, someone who boosts citizens' morale to make them feel as if they have contributed to ridding the world of evil.

Charismatic candidates say statements like President George Bush after 9/11, "Our war that we now fight is against terror and evil. Our struggle is going to be long and difficult. But we prevail. We will win. Good will overcome evil" (Greenberg & Kosloff, 2008, p. 8). Similarly, in his acceptance speech at the Republican National Convention, President Trump proclaimed, "Our convention occurs at a moment in crisis for our nation. The attacks on our police, and the terrorism in our cities, threatens our very ways of life" (Staff, 2016, p. 1). Both leaders encourage their supporters to stand behind them as they, presidential leaders, bring about much-needed change. Bush's use of perceived threats of evil reminds people of the dangers outside of their control. His words produce dedication and loyalty for people searching to find a cause that will be meaningful to their lives (Cohen, Thompson et al., 2017). Bush is confident that winning against terrorism is a group effort that requires everyone to become part of a whole. By doing so, he makes people feel needed, wanted, and even believe there will be a victory by rallying with fellow Americans like him. Trump confidently advocates that the Republican National Convention is necessary during such turbulent times, as people feel the nation is threatened. Gathering with like-minded individuals to create change becomes important.

Mortality salience produces adverse reactions to groups that threaten one's worldview. When death-related cognitions are salient, people naturally gravitate towards groups with similar worldviews and condemn those with different opinions (Greenberg & Kosloff, 2008). In *The Denial of Death*, Becker (1973) describes the need for people to rally in groups with people with similar worldviews:

We don't want to admit that we do not stand alone, that we always rely on something that transcends us, some system of ideas and powers in which we

are embedded and support us. This power is not always apparent. It need not be overtly a god or openly a stronger person. Still, it can be the power of an all-absorbing activity, a passion, a dedication to a game, a way of life, that, like a comfortable web, keeps a person buoyed up and ignorant of himself, of the fact that he does not rest on his center. All of us are driven to be supported in a self-forgetful way, ignorant of what energies we draw on, of the kind of lie we have fashioned to live securely and serenely (pp. 55-56).

People yearn to be connected to those similar to them, which is being done at Trump's rallies. Studies have shown that mortality salience brings out different reactions than the consideration of pain, paralysis, or uncertainty (Greenberg & Kosloff, 2008). Anxiety during death-related thoughts decreases when intergroup contact increases. During Mr. Trump's presidency, groups with ties to White supremacy, such as the Proud Boys, held rallies and became more publicly visible, perhaps as a consequence of feeling emboldened by his rhetoric. Mr. Trump has gained support from authoritarians through perceived threats related to fear of immigrants and constant reminders of mortality salience.

Greenberg et al. (1990, Study 2) hypothesized that when mortality was made salient, there would be a difference between how high authoritarians and low authoritarians judged individuals with attitudes different than their own. Consistent with predictions, when mortality was made salient, high authoritarians liked others who expressed attitudes dissimilar to their own less than others who said similar attitudes. In contrast, for low authoritarians, mortality salience did not significantly affect the degree to which they liked people who expressed attitudes dissimilar to their own. These results are important because they demonstrate that authoritarianism is one of the personality characteristics that modulate interpersonal reactions to mortality salience (Greenberg et al., 1990).

### **Current Study**

Numerous factors led to increased support for Donald Trump during the 2016 Presidential election. The current study focuses on two of these factors. Specifically, the current research addresses the following questions: 1) "How does authoritarianism influence political preferences for Donald Trump?" and 2) "How does mortality salience affect political preferences for Donald Trump?"

Mr. Trump positioned himself as an anti-establishment candidate during his campaign and frequently made disparaging remarks about immigrants. Previous research suggests that these themes resonate with high authoritarians. For example, Bakker et al. (2016) found high authoritarians supported charismatic leaders who disparaged immigrants and people who were anti-establishment. In the current study, based on these results and those of MacWilliams (2016b), it was hypothesized that there would be a positive correlation between authoritarianism and support for Donald Trump. Based on the results of Cohen, Solomon, & Kaplin (2017), it was also hypothesized that the participants for whom death-related anxiety was made salient would evaluate President Trump more favorably than participants for whom pain-related anxiety was made salient. Finally, based on the findings of Greenberg et al. (1990, Study 2), it was hypothesized that there would be an interaction between authoritarianism and death-related anxiety that would lead to increased support for Donald Trump. Precisely, it was predicted that following mortality salience, the magnitude of increased support for Donald Trump would be more significant for participants who were high in authoritarianism than for participants who were low on authoritarianism.

### **Method**

#### **Participants**

A sample of 298 participants were randomly assigned to mortality salience (M.S.) or pain salient control conditions in a study of the relationship between personality attributes and current social issues. To increase diversity within the sample compared to that of a college setting, participants were recruited on Amazon's Mechanical Turk during February of 2018 (Buhrmester et al., 2011). Participants were certified Amazon Mechanical Turk users over the age of 18 years old. All participants ("workers") had a 95% HIT approval rate, which means they were approved by providers ("requesters") 95% of the time they submitted survey responses in previous studies on the platform. Participants received \$.50 for completing the surveys.

Participants were given a list of options and asked to select the demographic qualities that best defined them. Participant demographics were the following: 49.45% female and 50.55% male; ethnically, 75% participants self-identified as White, 11% as African-American, 7% as Asian, 1.1% as Asian Indian or Alaska Native, 3.3% as Mixed (selected multiple ethnicities), 1.1% as Hispanic, 1.5% as other; religiously 62.6% of participants self-identified as a Christian denomination, 3.7% as Jewish, 3% as Buddhist, 2.6% as Hindu, 2.6% as Muslim, 24.5% as Atheist, and 3% as other. Regarding

political orientation, 35.2% identified as Conservative, 46.2% as Liberal, and 18.6% as Neither. The mean age of participants was 39.1 years, and the median age was 35.

## Measures

### **Authoritarianism**

To measure authoritarianism, a brief measure of child-rearing values was used (Feldman & Stenner, 1997). Participants selected the value from each pair of qualities they believed were more important for a child to possess— independence or respect for elders; obedience or self-reliance; curiosity or good manners; and being considerate or well behaved.

### **Mortality Salience Manipulation**

The scale consists of a 15-item true-false questionnaire that is associated with death-related thoughts (e.g., “Does the thought of leaving loved ones behind when you die disturb you?”, “Do you worry about dying?”) (Vess et al., 2009). Participants in the control condition responded to a parallel survey regarding the experience of general physical pain.

### **Affect**

Participants completed a shortened version of Watson et al.’s (1988) Positive and Negative Affect Schedule (PANAS). The questionnaire measures positive and negative affect. Participants rated their current mood on a scale of 1 (*very slightly to not at all*) to 5 (*extremely*). This scale allowed immediate effect assessment after mortality salience was presented (Vess et al., 2009).

### **Delay Task**

Consistent with the procedures used in past research (e.g., Vess et al., 2009), after completing the affect scale, participants read an innocent passage taken from “The Growing Stone” (Camus, 1957) and answered two questions (i.e., “How do you feel about the overall descriptive qualities of the story?” and “Do you think the author of this story is male or female?”). This task was used to create a delay between the mortality salience manipulation and the questions regarding support for Donald Trump.

### **Support for Trump**

Participants answered an opinion survey that consisted of four questions: “How favorably do you view Donald Trump?” “To what extent do you admire Donald Trump?” “To what extent do you have confidence in Donald Trump as a leader?”, “If you vote in the upcoming 2020 Presidential election, how likely is it you will vote for Donald Trump?” the scale ranged from 1 (*Not at All*) to 9 (*Very Much*).

## **Demographics**

The demographics questionnaire consisted of questions about age, biological sex, ethnicity, religious affiliation, religiosity, and political orientation. Participants were given a scale of 1 (*not at all*) to 10 (*extremely*) to measure the question of how religious they are. Political orientation was measured using a 1 (*Very Conservative*) to 9 (*Very Liberal*) scale. There were four choices available for the question “I paid very close attention to the 2016 Presidential campaign” (*strongly disagree, disagree, agree, strongly agree*). Participants were able to choose from three political preferences (*Conservative, Liberal, or Neither*).

## **Procedure**

After providing informed consent, the participants completed two filler questionnaires and a brief measure of authoritarianism (Feldman & Fenner, 1997). Mortality Salience participants were then asked a series of true-or-false questions related to their death. Control participants responded to similar questions regarding experiences of pain. To create a delay between the mortality salience manipulation and the dependent measures, participants completed the PANAS and answered two questions about an innocuous passage from a classic work of literature. The delay is significant because mortality salience has the strongest influence on judgments and behaviors when death-related thoughts are accessible but outside of conscious awareness (Vess et al., 2009).

Participants then responded to four questions that were designed to measure their level of support for Donald Trump. Then, participants completed the demographics questionnaire. In the last section, participants were instructed to respond to the following prompt: “Please take some time to write about your fondest memory in as much detail as you can.” This portion of the survey was used to aid in the alleviation of a negative mood/experience if they experience some mental discomfort while contemplating thoughts related to death or physical pain (Vess et al., 2009). Participants were debriefed at the end of the survey about the two primary purposes of the study.

## **Results**

### **Criteria for Excluding Data from Analysis**

The initial data file included 298 participants. Responses from the 15 participants who did not complete the survey were excluded from analysis. Features on Qualtrics and Amazon Mechanical Turk were used in hopes of preventing participants from taking the survey multiple times from the same IP address. Nevertheless, 10 rows of the data file came from participants who

completed the survey more than once from the same IP address. All responses from these 10 participants were excluded from analysis. Data from one participant who indicated an age of less than 18 years old was also excluded from analysis.

Prior to data collection, it was decided that data for participants who took less than five minutes to complete the entire battery of surveys would be excluded from analysis. The rationale for this exclusion criterion was that participants who completed all the surveys in less than five minutes spent an average of fewer than three seconds per question. As a result of this criterion, the 64 participants who completed the survey in less than five minutes were excluded from analysis. The results reported below are based on the remaining 208 participants.

### Support for Trump

We examined the potential correlation between the primary dependent measure, support for Donald Trump, and authoritarianism. The responses to the questions on the child-rearing scale were used to measure authoritarianism. They were re-coded so that the "authoritarian" responses were scored as 1 (respect for elders, obedience, good manners, being well behaved), and the "nonauthoritarian" responses (independence, self-reliance, curiosity, being considerate) were scored 0. The authoritarianism scores were computed by summing all four of the re-coded values such that the sum could range from 0 to 4. The responses to the four questions were combined ( $\alpha = .982$ ) to form a composite index indicator. A significant positive correlation was found between scores on the authoritarianism scale and support for Donald Trump,  $r(206) = .323, p < .001, R^2 = .104$ . As authoritarianism scores increased, so did support for Donald Trump. Authoritarianism accounted for 10.4% of the variance in support for Donald Trump.

A 2 (Mortality Salience vs. Control) x 2 (gender) between-subjects ANOVA did not yield the predicted main effect of mortality salience,  $F(1, 204) = 0.71, p = .39, R^2 = .003$ . Participants in the mortality salience condition did not report higher support for Trump ( $M = 3.67, SD = 2.92$ ) than the control participants ( $M = 3.96, SD = 3.00$ ).

A regression analysis was performed with the mortality salience manipulation (coded as 0 = *pain*, 1 = *mortality salience*) entered in the first step, authoritarianism entered in the second step, and the interaction between these two variables entered in the third step. The results of this analysis did not yield the predicted authoritarianism x mortality salience interaction,  $b = 0.19, t(204) = 0.70, p = .48$ .

### Role of Religion

The demographic questionnaire asked participants, "On a scale of 1-10 (1=*not at all*, 10=*extremely*), how religious, are you?" There was a positive correlation between religion and support for Trump  $r(206) = .42, p < .001, R^2 = .18$ . Higher religiosity was associated with increases in support for Donald Trump.

### Discussion

This study proposed three hypotheses: to determine whether there would be a positive correlation between authoritarianism and increased support for Donald Trump, whether participants for whom death-related anxiety was made salient would evaluate President Trump more favorably than participants for whom pain-related anxiety was made salient, and whether there would be an interaction between authoritarianism and death-related anxiety that would lead to increased support for Donald Trump.

The results indicated that among a sample of Mechanical Turk users, as scores on authoritarianism increased, support for Donald Trump increased. This result coincides with the findings described in MacWilliams's (2016b) book *The Rise of Trump: America's Authoritarian Spring*, who found that authoritarianism, as measured by the child-rearing scale (Feldman & Fenner, 1997), was among two variables statistically and substantively significant predictors of support for Trump. MacWilliams (2016b) observed that the second predictor of support for Trump was the personal fear of terrorism. Both authoritarian and nonauthoritarian voters are highly concerned that terrorists will strike the United States again. MacWilliams argued that this fear of terrorism yielded "a receptive audience for the finger-pointing of a fear-mongering candidate like Donald Trump" (p. 28).

Contrary to the findings of Cohen, Solomon, & Kaplin (2017), the results of the current study did not support the prediction that there would be more favorability toward Donald Trump for those whose death-related anxiety was made salient than for those whom pain-related anxiety was made salient. Also, the prediction that there would be an interaction between authoritarianism and mortality salience was not supported. Perhaps the lack of support for these predictions was due to a weak manipulation of mortality salience. Participants were unable to thoroughly think about death or anxiety by answering true-or-false questions. We regard our weak manipulation of mortality salience as the biggest limitation of the current study. Although we initially considered using a mortality salience induction involving responses to open-ended prompts, we ultimately chose not to do so because we had

doubts that the manipulation would be effective in a somewhat lengthy online survey.

When feasible, future researchers should consider employing a stronger manipulation of mortality salience. For example, Cohen, Solomon, and Kaplin (2017) instructed participants to write multiple sentences describing thoughts related to their death. This type of open-ended prompt might have produced a stronger manipulation of mortality salience. Future researchers who wish to examine the impact of mortality salience on political preferences might be more likely to find support for their hypotheses if they utilize this type of open-ended prompt. Mortality salience inductions have been effective in numerous prior studies, especially those that were conducted in-person in a laboratory.

Alternatively, future researchers who examine Terror Management Theory might want to consider comparing the two methods of inducing mortality salience. Specifically, a study could evaluate the effectiveness of the true or false version to the open-ended version of the death anxiety questionnaire. When researching the factors that influence support for charismatic leaders, it would still be beneficial to examine the ways that authoritarianism might interact with each of these types of mortality salience inductions.

Social psychologists have been searching for answers to identify how Donald Trump won the 2016 presidential election despite various groups' negative feedback. His election campaign included discrimination and created fear among voters. Through an understanding of authoritarianism, ingroup bias, scapegoating, and mortality salience, researchers have been able to understand the reasoning behind people supporting Donald Trump.

Research on Terror Management Theory has demonstrated that mortality salience (the increased accessibility of thoughts related to one's own death) magnifies positive reactions to those who uphold cherished cultural values as well as negative responses to those who oppose such values (Greenberg et al., 1990). Furthermore, Landau et al. (2004) provided compelling evidence to support the claim that mortality salience increases support for charismatic leaders. For example, following the terrorist attack on September 11, 2001, people thought about their mortality. This "real-life mortality salience induction" (Cohen, Solomon, & Kaplin, 2017, p. 350) led to increased support for George Bush. Similarly, recent research on a sample of college students (Cohen, Solomon, & Kaplin, 2017) demonstrated that mortality salience increases support for Donald Trump. In their discussion section, the authors encouraged future researchers to attempt to replicate these results in a

heterogeneous sample consisting of a broader range of ages than can be found on most college campuses. The current research is in line with the authors' recommendation.

Furthermore, this research is vital to society as it seeks to shed light on the impact of mortality salience and authoritarianism on political preferences and support for charismatic leaders, such as Donald Trump, who use psychological manipulation to heavily impact people's perception of justice and equality. It is important for voters to understand the implications of fear-based political messages when voting because it may negatively affect some Americans based on religion and race. Voters may be more likely to make informed voting decisions if they understand the power that fear-based political rhetoric has on voting outcomes. In order for democracy to prevail, it is essential for voters to make rational decisions based on the candidates' qualifications and stances on issues such as immigration, systemic racism, and gun control, not fear.

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## INDIVIDUALISM AND COLLECTIVISM PREDICTING JOB PLACEMENT AND SATISFACTION FOR RECENT COLLEGE GRADUATES

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**Abstract** – This longitudinal study sought to understand how personal individualism and collectivism correlate with job placement and satisfaction immediately after college graduation. In phase one, undergraduate seniors completed surveys determining their personal level of individualism and collectivism (via the “Culture Orientation Scale”, Triandis & Gelfand, 1998). Using a modified version of the same scale, they also described their most realistic job and their ideal job, post-graduation. Several months after these seniors graduated, they were contacted again for phase two. This time, they completed surveys regarding the job they actually accepted. Results revealed a strong correlation between the individualism and collectivism of the participants’ personalities and the individualism and collectivism of the jobs they imagined and actually landed after graduation. Phase two results also revealed that, surprisingly, job satisfaction was not significantly associated with an individualism / collectivism match between the individual and their job. Further analyses indicated that instead, job satisfaction is tied to other factors such as supervision, nature of the job, and organization communication.

*Keywords:* individualism, collectivism, job placement, job satisfaction

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Cross-cultural psychologists commonly split cultures into two categories: individualist and collectivist. Individualist cultures are centered around promoting and rewarding personal achievement over group goals (Hui & Triandis, 1986; Ramesh & Gelfand, 2010). This results in strong competition among people. In contrast, collectivist cultures are centered around the entire community. They value conformity and harmony, and they prioritize group achievement over individual achievement (Ramesh & Gelfand, 2010).

These two distinct cultures play an important role in how people view themselves and others. People from individualist cultures tend to have an independent view of themselves (Triandis, 1996). This means they see themselves as separate from others and define themselves by their personal characteristics. For example, an individualist might say, “I am ambitious, outgoing, and goal-oriented.” People from collectivist cultures tend to have an interdependent view of themselves. They see themselves as bound to others and define themselves based on their interpersonal relationships. A collectivist might say, “I am a loving spouse, devoted worker, and caring friend” (Hui &

Triandis, 1986). Collectivists are more likely to define the “self” as part of their salient groups (Triandis, 2001a).

While many studies have explored this basic distinction, expansion of the theory and its applications have been anticipated (e.g., Herrmann-Pillah, 2016). Triandis, one of the early pioneers on the individualism / collectivism distinction, has suggested that it will play a key role in predicting management and organizational decisions in the future (Triandis, 2001b). These applications include promotion of diversity (Madhlangobe & Gordon, 2012); understanding global economics (Judge et al., 2014), military cooperation (Soeters & Manigart, 2009), language used in business deals (Harris & Bargiela-Chiappini, 2003), gender equity (Hang-yue et al., 2006), and more.

Much of the individualism / collectivism research thus far has been conducted in East Asian and “Western” cultures (“Western” refers to cultures such as the U.S., Canada, and Western Europe). Research shows that Western societies are more individualist and East Asian cultures are more collectivist (Ramesh & Gelfand, 2010). For example, people in collectivist China are more likely to derive their locus of control from both direct and

indirect sources, such as their friends and family (Chia et al., 1998). However, the culture in which one grows up does not necessarily determine whether they, personally, are more individualist or collectivist. For example, the United States is widely accepted as an individualist nation. However, not everyone raised in the United States is an individualist themselves. Therefore, individualism / collectivism is both a cultural and personality variable (Hui & Triandis, 1986).

### **Relevance to Job Placement and Satisfaction**

One of the primary focuses of this study is to understand how individualism and collectivism correlate with job placement. We were interested in whether people high in individualism are more likely to select jobs that provide an individualist culture. The same applies for people high in collectivism. In addition, it is important to distinguish between people's ideal future job and the job they are most realistically likely to have immediately after graduation, so this was accounted for in the current methodology.

This connection between cross-cultural psychology and industrial-organizational psychology has not been investigated to its fullest potential, although some relevant literature exists. Hartung and colleagues (2010) explored how measures of individualism and collectivism relate to occupational plans and work values. It was hypothesized that collectivists would report less fit between their occupations and their personal goals, rooted in the idea that collectivists are generally less focused on their personal goals when making career decisions. This hypothesis was not supported, and collectivists may be as likely as individualists to have careers that align with personal aspirations. Other work found that collectivists report higher job satisfaction than individualists, regardless of workplace culture (Hui et al., 1995), suggesting the association may be relatively complex. Our study extends their work by further exploring links between personal individualism / collectivism, job placement, and job satisfaction.

There has been little research to date explicitly focused on the relationship between employee/organization individualism / collectivism match and how this relationship affects job satisfaction. Previous research indicates that general personality traits and role preferences do influence job satisfaction (Holland, 1985), but our study focused specifically on individualism / collectivism. Research has also shown that individualism and collectivism could have effects on employee turnover (Ramesh & Gelfand, 2010). While turnover may be an indirect measure of job satisfaction, our study measured satisfaction directly.

Moreover, while individualism and collectivism have not explicitly been linked to job satisfaction, they have been studied under the scope of general life satisfaction and happiness. Tamir et al. (2017) cross-culturally examined satisfaction within eight countries: The United States, Brazil, China, Singapore, Germany, Ghana, Israel, and Poland. This sample contained people from countries that are regarded as individualist (e.g., The United States) and collectivist (e.g., China and Singapore). Across all countries and both kinds of culture, happy people were those who often experienced emotions they *wanted* to experience, whether they were pleasant or unpleasant emotions. This finding implied that happiness is linked to experiencing emotions that “feel right.” Perhaps a similar trend exists in the job market, where employees are satisfied with organizational cultures that “feel right.”

Ramesh and Gelfand (2010) investigated the relationship between job “embeddedness” and voluntary employee turnover in individualist and collectivist cultures. Job embeddedness refers to the factors (e.g., perceived fit, sacrifice) that affect employee retention. Voluntary turnover refers to the action of deliberately leaving an organization. For their study, they researched organizations in the United States (an individualist culture) and India (a collectivist culture). They chose to study call centers because they had similar market conditions in both countries. In the form of an online survey, they sent out an altered version of the “job embeddedness model” survey (Mitchell & Lee, 2001). This model specifically tested person-job fit and person-organization fit. Approximately six months after this survey was administered to employees, they measured the number of voluntary employee turnovers from each organization. Ultimately, they discovered that job fit influenced employee turnover more in the United States than in India. In other words, an American employee with low person-job fit was significantly more likely to leave the organization than an Indian employee. The researchers suggested that in individualist cultures, it is more important that an occupation is a “good fit” for employees. However, in collectivist cultures, occupations are mostly decided by social pressures, such as living up to family expectations (Ramesh & Gelfand, 2010).

The present study is significant because it will hopefully shed additional light on individualism / collectivism and job placement and satisfaction. In particular, it will determine whether a company's perceived individualism / collectivism needs to be in alignment with personal individualism / collectivism for employees to be satisfied. This information would greatly benefit leaders of organizations, especially those in cross-

cultural contexts. When an employee is more satisfied, job performance and occupational commitment increase (Bakan et al., 2014).

### Hypotheses

1. There will be a positive correlation between personal individualism / collectivism scores and perceived individualism / collectivism in one's ideal post-graduation job (measured in phase one, before college graduation).
2. There will be a positive correlation between personal individualism / collectivism scores and the perceived individualism / collectivism of one's actual first post-graduation job (measured in phase two, four months after graduation).
3. Better alignment between personal and actual job individualism / collectivism will be associated with higher job satisfaction (measured in phase two).

### Phase One Method

#### Participants

A total of 46 college seniors participated in phase one (15 men [32.61%] and 31 women [67.39%]). Most were White (91.3%); other self-identified races were Hispanic/Latine/Latinx (6.52%) and Black (2.17%). Participants ranged in age from 20 to 49 ( $M = 25.72$ ,  $SD = 8.29$ ).

#### Measures

The first phase consisted of measuring each participant's personal individualism and collectivism, as well as the perceived individualism and collectivism of their future jobs. The individualism and collectivism scores of the participants' future jobs were not objective measures, but rather each participant's subjective assessment. Future jobs included both what they expected from their most realistic immediate job after graduation and their ideal job. All of these variables were measured using variations of the Culture Orientation Scale (Triandis & Gelfand, 1998).

Personal scores for both individualism and collectivism were based on the original scale. It consists of 16 items on a 9-point Likert-like scale (where 1 = *never or definitely no* and 9 = *always or definitely yes*). Half the items measure personal individualism (e.g., "It is important that I do my job better than others") and half measure personal collectivism (e.g., "If a coworker gets a prize, I would feel proud"). Items in each subscale are averaged for a composite measure. In this sample, personal individualism ranged from 3.88 to 8.13 ( $M = 6.26$ ,  $SD = 0.99$ ) and personal collectivism ranged from 4.38 to 8.25 ( $M = 6.93$ ,  $SD = 1.00$ ). Internal consistency was good for both subscales (both  $as > 0.73$ ). These

scores are similar to those cited in previous literature for U.S. college students (e.g., Li et al., 2018).

To measure perceived individualism / collectivism in one's most realistic first job and ideal job, the scale items were modified. For example, the two items above were changed to, "In this role, it will be important that I do my job better than others" and, "In this role, when a coworker gets a prize, I will feel proud." Participants used the same 9-point Likert-like scale for each item, and again items were averaged for composite measures. The items were presented twice, with these instructions:

*The following statements are very similar to the statements you previously saw. However, they are very different and serve distinct purposes. Answer these statements based on the job you realistically expect to land immediately after graduation [or] your ideal or dream job.*

For all four of these subscales, internal consistency was good (all  $as > 0.72$ ).

#### Procedure

During spring semester 2020, the registrar of the hosting university provided a list of all seniors who would be graduating that May (total  $N = 282$ ), including both residential and online students. Each person was recruited for the study via email. Students were told the purpose of the study and that participation in each phase would enter them in a lottery for cash cards (phase 1 = \$10, phase 2 = \$20). Each person was contacted up to three times for recruiting purposes. The final sample for phase 1 was 46 people, or 16.3% of those contacted. If willing to participate in phase one, students clicked a link which directed them to a survey on the website PsychData. After reading consent information, participants completed demographic questions, the Culture Orientation Scale, and two modified versions of the Culture Orientation Scale.

### Phase One Results

Hypothesis 1 was that there will be a positive correlation between personal individualism / collectivism scores and perceived individualism / collectivism in one's ideal post-graduation job. For exploratory purposes, perceived individualism / collectivism was also measured in one's most realistic post-graduation job, or the job they expected to land.

For participants' perceptions of their most realistic first job, overall individualism ( $M = 5.06$ ,  $SD = 1.17$ ) was lower than overall collectivism ( $M = 6.98$ ,  $SD = 0.97$ ). Participants thus expected that their first post-graduation job would have slightly higher collectivism in

terms of employee culture. The same general pattern was found for participants' perceptions of their ideal future job, with overall expected individualism ( $M = 5.57$ ,  $SD = 1.32$ ) lower than overall expected collectivism ( $M = 7.09$ ,  $SD = 1.11$ ).

All four tested correlations were positive and statistically significant, supporting Hypothesis 1. Higher personal individualism was associated with both higher perceived individualism in one's most realistic post-graduation job [ $r(46) = .53$ ,  $p < .001$ ] and one's ideal post-graduation job [ $r(40) = .45$ ,  $p = .004$ ]. Similarly, higher personal collectivism was associated with both higher collectivism in one's most realistic post-graduation job [ $r(46) = .50$ ,  $p < .001$ ] and one's ideal post-graduation job [ $r(40) = .38$ ,  $p = .017$ ]. Perhaps surprisingly, the correlations for what one expected in their most realistic first job were slightly higher than what they perceived or hoped for their ideal future job. Overall, Hypothesis 1 was supported.

## Phase Two Method

### Participants

Of the original 46 participants from phase one, 24 completed phase two (7 men [29.2%] and 17 women [70.8%]). Most were White (95.8%) and one was Latinx (4.2%). Participants ranged in age from 21 to 40 ( $M = 23.83$ ,  $SD = 5.93$ ).

### Measures

Phase two consisted of measuring the individualism and collectivism of the participants' jobs they actually landed after graduation, as well as each participant's job satisfaction at their places of work. The individualism and collectivism of one's actual post-graduation job was again measured using a modified version of the Culture Orientation Scale (Triandis & Gelfand, 1998). Wording in the items was changed so that the subject was about the function of the job instead of the individual. For example, the two example items mentioned in the phase one methods were changed to, "In this role, it is important that I do my job better than others" and, "In this role, when a coworkers gets a prize, I feel proud." Participants used the same 9-point Likert-like scale for each item, and again items were averaged for composite measures. In this sample, individualism ranged from 3.25 to 7.13 ( $M = 5.15$ ,  $SD = 1.11$ ) and collectivism ranged from 4.75 to 9.00 ( $M = 6.58$ ,  $SD = 1.04$ ). Internal consistency continued to be good (both  $\alpha < .70$ ).

A global measure of job satisfaction was also incorporated in the survey (Dam, 2005). There are four items on this scale, each on a 5-point Likert-like scale (1 = *strongly disagree* to 5 = *strongly agree*). The four items

are: "My job gives me much fulfillment", "I am satisfied with my job", "I am usually enthusiastic about my job", and "I would recommend my job to others." All items are averaged for a composite score. In this sample, participants were fairly satisfied with their jobs ( $M = 3.86$ ,  $SD = 0.67$ , range from 2.50 to 5.00). Internal consistency for this measure was high,  $\alpha = .87$ .

For exploratory purposes, a final scale was included that measured factors known to predict job satisfaction (Spector's [1985] "Job Satisfaction Survey"). It consists of 32 items on a 6-point Likert-like scale (1 = *disagree very much* to 6 = *agree very much*) and contains nine different facets: pay, promotion, supervision, fringe benefits, contingent rewards, operating procedures, coworkers, nature of work, and communication. Each facet is measured with four items which are averaged for composite variables. Internal consistency for these facets was good, with all  $\alpha > .70$  except for perceived rewards (where  $\alpha = .55$ ) and operating conditions (where  $\alpha = .30$ ).

### Procedure

Approximately four months after graduating, participants from phase one were recruited through personal emails. They were reminded of the lottery for participating in phase two and were contacted up to three times. If willing to participate in phase two, they clicked on a link which directed them to another survey on PsychData. After reading consent information, participants completed the modified version of the Culture Orientation Scale, the Job Satisfaction Survey, and the global measures of job satisfaction.

## Phase Two Results

Hypothesis 2 was that there will be a positive correlation between personal individualism / collectivism scores and the perceived individualism / collectivism of one's actual first post-graduation job. As predicted, there was a significant positive correlation between personal and actual job perceived individualism [ $r(24) = .51$ ,  $p = .01$ ] and collectivism [ $r(24) = .47$ ,  $p = .02$ ]. Hypothesis 2 was supported.

The third hypothesis was that better alignment between personal and actual job individualism / collectivism would be associated with higher job satisfaction. New variables were created to test this hypothesis in which personal individualism was subtracted from the perceived individualism of one's actual job. Thus, if perfect alignment occurred, the score on this new variable would be zero. Anything over zero (positive or negative in direction) would indicate misalignment. The same was calculated for the difference between personal collectivism and actual job collectivism.

When these difference scores were correlated with global job satisfaction, the associations were not statistically significant [for individualism,  $r(24) = -.28, p = .18$  and for collectivism,  $r(24) = .228, p = .18$ ]. Hypothesis 2 was therefore not supported, indicating that alignment between one’s personal individualism / collectivism was not a significant predictor of satisfaction in one’s actual immediate post-graduation job in this sample.

For exploratory purposes, global job satisfaction was also correlated with Spector’s (1985) list of factors that traditionally predict job satisfaction. Of the nine factors measured in this study, three significantly predicted job satisfaction in the sample: supervision [ $r(23) = .62, p = .002$ ], nature of the job [ $r(23) = .78, p < .001$ ], and communication within the organization [ $r(23) = .43, p = .04$ ]. Contingent rewards were marginally associated with job satisfaction as well, [ $r(23) = .40, p = .06$ ].

In addition, a correlation matrix (see Table 1) shows how personal individualism and collectivism were associated with each aspect of job satisfaction included in Spector’s (1985) list. Personal individualism was not significantly correlated with any aspect of job satisfaction. Personal collectivism was significantly positively correlated with participants’ perceptions that their jobs had good supervision [ $r(23) = .45, p = .033$ ] and good co-workers [ $r(23) = .43, p = .041$ ]. These last two findings are unsurprising, as collectivism would be

tied to how one feels about their relationships with other people at the job.

**Discussion**

Triandis (1996, 2001a, 2001b) suggested that the continuum of individualism / collectivism would have varied effects on the workplace setting. This study explored whether personal scores on this spectrum were connected with job placement and job satisfaction. The first hypothesis was that there would be a positive correlation between personal individualism / collectivism scores and perceived individualism / collectivism in one’s ideal post-graduation job. This hypothesis was supported. This is an important finding because it demonstrates that individualism / collectivism scores matter to college graduates when they plan their future careers, at least in an ideal situation. From a job recruiting perspective, companies and non-profit organizations may be interested in knowing that college graduates hope for jobs that align with their personalities. This may be useful in terms of recruiting, wording of job ads, and so on.

Unlike the first hypothesis which was centered around ideal situations, the second hypothesis focused on what actually occurs in reality. We expected a positive correlation between personal individualism / collectivism scores and the perceived individualism / collectivism scores of one’s *actual* post-graduation job. This hypothesis was also supported. The validation of this hypothesis is significant because it sheds light on why college graduates select the jobs they do. Past work has

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Personal individualism	--	-.01	.03	-.14	.26	.12	.03	.38	.06	.12	.36	.21
2. Personal collectivism		--	.06	-.07	.45*	.07	.26	.32	.43*	.38	-.02	.31
3. Pay			--	.70	.14	.45*	.16	-.05	.04	-.41	-.21	-.08
4. Promotion				--	.06	.44*	.25	-.11	.04	-.34	-.07	-.13
5. Supervision					--	.25	.65**	.46*	.68**	.53**	.50*	.62**
6. Fringe benefits						--	.16	-.23	.18	-.18	.01	-.06
7. Contingent rewards							--	.33	.45*	.31	.37	.40
8. Operating procedures								--	.26	.06	.49*	.17
9. Coworkers									--	.24	.36	.31
10. Nature of work										--	.39	.78**
11. Communication											--	.42*
12. Global job satisfaction												--

**Table 1**  
*Correlations Among Variables*

*Note.* Degrees of freedom for all correlations are 23, except for the correlation between personal individualism and collectivism, where degrees of freedom are 46. Variables 1 and 2 are from Triandis & Gelfand (1998), Variables 3-11 are the subscales from Spector (1985), and Variable 12 is from Dam (2005).

\* indicates  $p < .05$ ; \*\* indicates  $p < .01$ .

identified the concept of “person-organization fit” and found that workplace cultures often emphasize a match between personal and organizational values, including individualism / collectivism (e.g., Treviño et al., 2020).

The third hypothesis was not supported. We expected that better alignment between personal and actual job individualism / collectivism would be associated with higher job satisfaction. Results showed that alignment (at least, as measured in this study) did not appear to be associated with job satisfaction, replicating (in part) the work by Hui and colleagues (1995). This prompted us to question what does matter. Of the nine facets measured in the job satisfaction survey (pay, promotion, supervision, fringe benefits, rewards, operating conditions, coworkers, nature of work, and communication), three of them strongly predicted job satisfaction in this sample: supervision, nature of the job, and communication within the organization. Supervision was defined as the relationship between employees and their supervisors (i.e., is it supportive). Nature of the job referred to how one perceives their work (i.e., is the job worthwhile and meaningful). Finally, communication referred to how well information is exchanged in the workplace.

The above finding is significant because it offers insight into factors that lead to job satisfaction among newly-employed college graduates. Job satisfaction is an aspect of the employee experience that human resources professionals from across the globe focus on because of its importance. Previous literature demonstrates the value of job satisfaction to organizations.

Bakan et al. (2014) examined the effect of job satisfaction on the levels of job performance and occupational commitment among university professors in Turkey. Job performance was broadly defined as how well a professor executed their job. Occupational commitment was defined as the degree to which professors believed in and accepted their organization’s goals/values and were willing to remain in their organization. Like the present study, Bakan et al. (2014) used Spector’s “Job Satisfaction Survey.” The results revealed that job satisfaction was positively associated with both job performance and occupational commitment.

For exploratory purposes, individualism and collectivism scores were also examined under Spector’s (1985) list of contributing factors to job satisfaction, including good supervisor and co-worker relationships. As noted in the results, personal collectivism was significantly positively correlated with participants’ perceptions that these relationships were good. These patterns are unsurprising when we refer back to the basic

tenets of collectivism. As noted in the literature review, collectivists hold an interdependent view of themselves based on their interpersonal relationships (Hui & Triandis, 1986). Therefore, it makes sense why high collectivism scores would positively correlate with good supervision and good co-worker relationships, since both of these groups serve as the most prominent examples of interpersonal relationships at work.

Subsequent research has expanded on this idea and supports the notion that collectivism is associated with closer co-worker relationships. Morris and colleagues (2008) studied employees of an international bank and made comparisons between cultures that are considered highly individualist (e.g., the United States) and cultures that are highly collectivist (e.g., China). American employees formed “thin and transitory coworker relationships” compared to employees in collectivist countries (p. 526). The authors suggested that individualist-oriented employees think of work relationships in terms of their utility (i.e., how can this benefit me), like a “market transaction” (p. 526). It is reasonable that when people from different cultures consider how positive their work relationships are, criteria for “positive” might shift, where individualists reflect on pragmatic factors and collectivists reflect on more humanistic factors.

The lack of support for Hypothesis 3 indicates that while college graduates often accept jobs that align with their personal individualism or collectivism, this factor does not appear to be integral to their satisfaction with those jobs. Instead, other factors in the organization matter more (e.g., support from one’s supervisor, a sense that the job is meaningful, and open communication). These three factors should be emphasized by managers and executives within any organization, as they are clearly tied to whether one’s work team will enjoy their career.

### **Limitations and Future Directions**

Despite the general success of this study, there were some limitations worth noting. First, the sample sizes in both phases were small. Sample size is important because it affects the precision of a study’s estimates and the extent to which conclusions can be drawn. The sample was also relatively homogenous and all from a single university; this means the ability to generalize the results to other populations is limited.

A second limitation is that phase two occurred only a few months after participants graduated. It is unclear how long each person had been in their job. Future research may want to either get additional cross-sections of samples who have been in their jobs for various periods of time, or potentially do longitudinal

research that follows a given sample over time. New employees may be particularly satisfied (or dissatisfied) with a job at first; this study did not gather any information regarding how satisfaction changes over time. Another limitation is that the individualism and collectivism scores of the participants' future jobs and current jobs were subjective measures and did not objectively measure the individualism and collectivism at their places of work. Future research may want to explore objective ways of measuring individualism and collectivism at workplaces and then evaluate how they relate to job satisfaction.

Finally, future research could explore other ways in which individualism / collectivism affects the workplace. For example, perceptions of whether one's supervisor is individualistic or collectivistic may affect whether one feels supported and understood. It would also be interesting to see how people fare who are particularly high in individualism or collectivism when they perceive that their culture tends to emphasize the opposite (e.g., a particularly individualistic person in an East Asian company). The overlap of cross-cultural and industrial-organizational psychology is an area fertile with research possibilities.

### Conclusion

Ultimately, this study added to the limited research there has been on individualism / collectivism and job placement/satisfaction. This is a valuable area of research because the information could be useful for society at large. Specifically, it is valuable to students, educators, and employers. Because personal individualism / collectivism was significantly correlated with the individualism / collectivism of post-graduation jobs, it is clear that person-job fit regarding individualism and collectivism matters in the job matching process.

This information is beneficial for students because they can use it as a tool to determine the work environments they are mostly likely to serve upon graduation. This is also valuable to educators because one of the primary goals of educators is to actualize their students' career ambitions. Finally, while individualism / collectivism did not seem to matter for job satisfaction, the information gained from this study could still be beneficial to employers because it did shed light on the factors that *do* predict job satisfaction (supervision, nature of the job, and communication). Honing in on these factors could maximize their business results.

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## THE ADVERSE IMPACTS OF COLLEGE STUDENTS' POOR MENTAL HEALTH AND SLEEP ON VACCINE EFFICACY DURING THE COVID-19 PANDEMIC

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**Abstract** – College students' mental health is a major factor influencing academic performance. Factors such as sleep and social interactions also play a role in students' mental health and physical health. Several aspects of student health are affected during the COVID-19 pandemic. In this study, we examine the literature on student mental health and sleep during the COVID-19 pandemic. The findings indicate that the pandemic has resulted in worsened mental health symptoms, social isolation, and poor sleep quality in students. Concerningly, inadequate sleep is associated with decreased immunity and vaccine efficacy. Thus, we must prioritize college students' mental health and adequate sleep. Better sleep can reduce the likelihood of COVID-19 infection through improved immunity. To improve sleep, we suggest providing students with accessible interventions. Some interventions include self-management techniques like sleep hygiene tips, mindfulness interventions that are also beneficial for mental health, and more opportunities for interaction in virtual learning environments to reduce social isolation. Addressing college students' sleep and mental wellbeing can help students and society return to in-person experiences faster and safer.

*Keywords:* college students, mental health, sleep, vaccine efficacy, COVID-19

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Pandemics have varying physical and mental health effects on individuals. Certain populations, such as college students, are more psychologically and physically vulnerable during the current COVID-19 pandemic (Son et al., 2020). Various factors impact a college student population's overall health and wellbeing, such as social interactions, stress, sleep, academic demands, and financial issues (Son et al., 2020). Unfortunately, sleep deprivation is common in university students. However, sleep is critical for vaccine efficacy, which is especially relevant for the current COVID-19 pandemic.

The purpose of this study is to determine how the COVID-19 pandemic has impacted college students' mental and physical health. Since mental health issues are the leading barrier to academic success for college students, it is important to address these issues (Son et al., 2020). Adequate mental health among college students is also important to ensure optimal vaccine efficacy at the population level, required for a safe return

to lecture halls with hundreds of students (Madison et al., 2021).

### **Mental Health in the COVID-19 Pandemic**

Son et al. (2020) completed a study to examine the effects of the COVID-19 pandemic on 195 college students' mental health at a public university in the United States. Their study found that 71% of participants reported increased stress and anxiety during the pandemic (Son et al., 2020). Multiple stressors have led to these worsened mental health symptoms. The transition to online schooling has increased students' concerns due to uncertainty about grades and larger workloads (Son et al., 2020). Moreover, students are having difficulty concentrating, primarily due to distracting home environments and the lack of interactive components in online lectures to maintain their attention (Son et al., 2020). In online school, Son et al. (2020) found that up to 86% of students reported experiencing social isolation during the pandemic, and 54% of students

reported decreased interactions with others (including friends) overall. Additionally, 86% of students reported having disrupted sleep patterns, and over half reported lower consistency in sleep and wake times (Son et al., 2020). All these factors contribute to poorer mental health, and for those facing multiple factors, it could make matters worse.

### **Social Interactions and Sleep Quality**

Social isolation is a crucial risk factor for experiencing loneliness (Bu et al., 2020). Predictors of high risk of loneliness during the COVID-19 pandemic include being a young adult, female, low income, living alone, and urban resident (Bu et al., 2020). Since many college students meet several of these attributes, it is clear that this population is at a higher risk of experiencing loneliness during the COVID-19 pandemic lockdown in North America (Bu et al., 2020). Moreover, the lockdown has resulted in pronounced delays in students' bedtimes and wake-up times, showing a greater impact on students and females in comparison to workers and males (Marelli et al., 2021). Before the pandemic, 39% of students reported having problems with sleep initiation (Marelli et al., 2021). During the pandemic, this percentage increased to 55%, suggesting more than half of students struggle with sleep initiation even with delayed bedtime and wake times (Marelli et al., 2021).

Additionally, Marelli et al. (2021) suggest that the effects of social isolation on loneliness and worrying could cause students to experience increased anxiety and depressive symptoms, leading to worse sleep quality. Anxiety also increases cortisol levels, consequently hindering melatonin production (Marelli et al., 2021). Melatonin plays a role in regulating the biological sleep-wake cycle. Poor sleep also affects sociality and loneliness. Both distress and loneliness are related to worse sleep quality, yet a lack of sleep, both short and long-term, leads to behaviors of social withdrawal and loneliness (Simon & Walker, 2018). Thus, poor sleep and loneliness may create a vicious feedback loop worsening both sleep and mental health.

### **Significance for the COVID-19 Pandemic**

#### **Sleep and Infection Risk**

Issues surrounding sleep quality are especially relevant during a pandemic. Sleep loss for long periods is known to enhance inflammation, which can dysregulate immune responses and leave an individual susceptible to disease (Besedovsky et al., 2019). Inadequate sleep is associated with an increased risk of developing respiratory infections like pneumonia (Besedovsky et al., 2019). Furthermore, depressive symptoms also enhance inflammation (Fagundes et al., 2013). As mentioned

earlier, factors such as loneliness, anxiety symptoms, and stress also contribute to sleep issues (Simon & Walker, 2018; Marelli et al., 2021). These findings suggest that poor mental health, high stress, and inadequate sleep can increase students' risk of COVID-19 infection.

### **Poor Mental Health, Inadequate Sleep, and Vaccine Efficacy**

Psychological stress slows the vaccine response and results in lower antibody levels after vaccination compared to individuals that do not experience stress after vaccination (Miller et al., 2004). Lower antibody levels were also found in college students experiencing loneliness one and four months after vaccination (Madison et al., 2021). Sleep plays an important role in vaccine efficacy. After vaccination, immune memories of a virus form during sleep. Immune memory is the long-term memory of a foreign substance like a virus, which leaves individuals better prepared for future exposure to the virus (Besedovsky et al., 2019). In several studies, on average, adequate sleep (more than 7 hours a night for adults) doubles the response to vaccines compared to groups with restricted sleep times (less than 7 hours a night for adults) (Besedovsky et al., 2019).

As highlighted in these studies, not only do poor sleep and mental health increase the risk of infection, but they also decrease vaccine efficacy. Vaccine efficacy rates refer to the percent reduction in disease within a group of people that receive a vaccine (typically in a highly controlled clinical setting (Madison et al., 2021). This is relevant today, as citizens receive COVID-19 vaccines with reported efficacies upwards of 90% produced by companies such as Pfizer, Gamaleya, and Moderna (Kim et al., 2021). Of greater concern is the vaccine's effectiveness, which is how much vaccines reduce infection in the real world (Madison et al., 2021). With so many factors leading to reduced vaccine efficacy, COVID-19 vaccines may not be as effective in college students and other psychologically vulnerable groups.

### **Potential Solutions**

Although it is too early to determine if vaccine effectiveness is lower among students, prevention measures can combat this anticipated effect. Son et al. (2020) suggested that most college students manifest maladaptive coping behaviors in response to stress and anxiety from the pandemic. Son et al. (2020) also found that 93% of participants that reported increases in stress and anxiety during the pandemic did not use school counselling services, despite these services being widely promoted. Son et al. (2020) suggest that students preferred self-management methods to cope with their mental health issues. A potential explanation could be that students did not believe they needed or could benefit

from accessing mental health services. In other situations, inadequate access to mental health resources can be a factor. Future research should establish which method of help-seeking students prefer to increase accessibility.

### Self-Management

Students may benefit from increased access to self-management techniques. These resources should include topics such as sleep hygiene and stress management with positive coping mechanisms. Another approach could involve virtual cognitive behavioral therapy for insomnia (CBT-I). CBT-I is the front-line treatment for insomnia in adults and has more effective long-term benefits than sleep medications (Cliffe et al., 2020). A digital approach also caters to the suggested self-management preference of college students. Colleges can provide an app for CBT-I as part of students' wellness resources. Findings from a study on digital CBT-I effectiveness for young people showed improvements in sleep, anxiety and depression (Cliffe et al., 2020).

### Mindfulness Interventions

Another approach to improving students' mental health and immune responses are mindfulness-based interventions. Findings from a meta-analysis by Rusch et al. (2018) suggest that mindfulness meditation may help with certain aspects of sleep disturbance. Mindfulness meditation can also reduce rumination, which involves excessive overthinking that results in stress (Rusch et al., 2018). Rumination may impede an individual's ability to relax when it's time to sleep, which consequently hinders sleep initiation. Thus, reducing incessant rumination could help improve sleep quality (Rusch et al., 2018). Moreover, a short-term mindfulness-based intervention increased responses to influenza vaccination in healthy employees (Davidson et al., 2003). Mindfulness interventions also reduce harmful effects of inadequate sleep, like dysregulated immune responses (Creswell et al., 2016; Davidson et al., 2003). These studies suggest that mindfulness interventions may be another approach to improving sleep, immunity, and vaccine efficacy. Many apps for mindfulness meditation are available for students to access for free. College wellness resources (such as websites) should include a list of available apps to ensure students know they exist.

### Institutional Approaches

Educational institutions could also implement systematic changes. One such change could target creating more opportunities to socialize in online education. College students experiencing loneliness had lower vaccine responses, but contact with many people provided some protection, even if the interactions were

not regarded as subjectively satisfying (Madison et al., 2021). These types of interactions are possible in virtual settings. Instead of posting pre-recorded lectures for students to watch on their own time, professors should shift to providing live lectures via software such as Zoom. This would allow students to see others and interact during a lecture. Live lectures can be recorded and posted afterwards for students to review, so there is no disadvantage to this approach for international students who cannot make it due to time zone differences. Professors could also have virtual tutorials as part of their course structure to allow students to interact with others in a more intimate setting.

### Conclusion

As COVID-19 infections and deaths continue to rise, we must address mental health and sleep in vulnerable populations like college students. Not only is this important for reducing infection rates at the population level, but sleep and adequate mental health play a critical role in ensuring optimal vaccine efficacy. Addressing sleep will protect college students' health and potentially allow a faster return to normal in-person education.

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## IT IS MORE THAN UNDERSTANDING OTHERS: PERSPECTIVE-TAKING CHANGES SELF-PERCEPTIONS

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**Abstract** – The imaginary nature of taking another’s perspective affects how individuals view themselves. This process, known as perspective taking, is the adoption of another person's point of view by taking on his/her personality or adopting his/her way of thinking (Greenbert & Murphy, 2019). Research demonstrates that perspective-taking can blur the distinction between the self and another person (Burgoyne et al., 1999). Consequently, this study examined if participants’ self-perceptions can be modified by taking the perspective of certain characters. Using a pre-test/post-test independent-groups design, data were collected from 106 undergraduate students enrolled in psychology courses at a mid-sized private university. Prior to random assignment to one of four conditions, participants completed a questionnaire assessing their self-perceived morality and helpfulness (pre-test). Subsequently, participants completed a perspective-taking task where they took the first-person perspective of either a superhero or supervillain (experimental conditions) or the third-person perspective of a superhero or supervillain (control conditions). Finally, participants re-completed the questionnaire assessing their self-perceived morality and helpfulness. The study found a significant increase in self-perceived helpfulness when participants took the first-person perspective of a superhero and a significant decrease in self-perceived helpfulness when participants took the first-person perspective of a supervillain. In contrast, no change was found for participants’ self-perceived helpfulness when they took the third person-perspective of a superhero or supervillain. Effects of perspective taking on participants’ self-perceived morality were consistent with self-perceived helpfulness, but only marginally significant. The current study provides evidence to support the claim that perspective-taking can result in (positive and negative) alterations in self-perceptions.

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Perspective-taking involves the ability to understand other people’s inner states (e.g., emotions, point of view) by taking on their personality or adopting their way of thinking (Greenbert & Murphy, 2019). Perspective-taking tends to promote individuals’ understanding of another person by evoking empathy and/or providing a deeper understanding of the other person (Batson et al., 1997a; Batson et al., 1997b; Gerace et al., 2013; Nelson & Norton, 2005; Yoon & Vargas, 2014). The positive effects of perspective-taking are well documented and can include, but are not limited to, promoting altruistic, prosocial, and compassionate behaviors toward others (Nelson & Norton, 2005; Yoon & Vargas, 2014). Although perspective-taking frequently yields altruistic, prosocial, and compassionate behaviors toward others, research examining the effects of perspective-taking on the perspective takers themselves is limited (Brown et al., 2019; Ruby & Decety, 2013). Of

the limited research available, relatively recent works on the neurological mechanisms associated with perspective-taking reveal neural activity that creates an environment in which self-perceptions are malleable (Brown et al., 2019; Ruby & Decety, 2013). Given many occupations, such as those in health care, counseling, art, music, and theatre, actively utilize perspective-taking to promote individuals’ understanding of patients, clients, or subjects, it is surprising (and concerning) that there is little research examining if perspective-taking influences (and, possibly, has the power to change) the perspective-taker’s own self-perceptions/identity. Consequently, the purpose of the current study was to examine if, and the extent to which, individuals’ self-perceptions can be altered by perspective-taking.

### **Power and Process of Perspective-Taking**

A robust literature in psychological science documents the power of perspective-taking to alter

individuals' attitudes and behaviors toward others (Batson et al., 1997a; Batson et al., 1997b; Gerace et al., 2013; Yoon & Vargas, 2014). For example, perspective taking has been shown to decrease the activation of individuals' stereotypes and reduce intergroup conflict (Batson et al., 1997a; Galinsky, 2002; Galinsky & Moskowitz, 2000), promote empathy for others (Cialdini et al., 1997), and increase the likelihood of individuals' prosocial and altruistic behaviors (Batson et al., 1995). The positive effects of perspective taking may be relatively unsurprising given literature documenting that it is most likely to occur when individuals report a heightened desire to understand others (Davis et al., 1996; Fennis, 2011), particularly following challenging interpersonal experiences such as altercations or arguments (Gerace et al., 2013). Once motivated to engage in perspective-taking, individuals must imagine themselves in the *first*-person perspective of the target person (Greenbert & Murphy, 2019). That is, true perspective taking involves the first-person perspective, which requires individuals to imagine themselves as the target individual (i.e., I am angry with and for the target person) rather than a third-person perspective (i.e., thinking and understanding that a target person is angry).

One explanation for why perspective taking has the power to alter individuals' attitudes and behaviors toward others is that perspective taking has been shown to merge conceptions of the self and other, in which perspective takers' thoughts about others become more selflike (Davis et al., 1996; Galinsky & Moskowitz, 2000). That is, after perspective taking, there are heightened perceptions of self-target overlap, such that a greater number of self-relevant traits or characteristics are ascribed to a target (Davis et al., 1996) – making a target more “likeable” and, therefore, worthy of individuals' prosocial attitudes and behaviors. However, despite the literature documenting how perspective taking affects perceptions of and behaviors *toward* others – as a result of seeing the target person as more similar to the self – little research has examined if perspective taking affects the perspective taker's own *self* perceptions.

Of the limited research available relevant to understanding if perspective taking can change perspective takers' self-perceptions, recent neurological work suggests that perspective-taking alters neural activity in specific areas of the brain creating a neural environment where self-perceptions are malleable (Brown et al., 2019; Ruby & Decety, 2013). Specifically, when an individual engages in perspective-taking, there appears to be deactivation in the ventromedial prefrontal cortex (VPC), which is associated with self-identity, and

an activation in the precuneus, which is associated with creativity and imagination (Brown et al., 2019; Ruby & Decety, 2013). Interestingly, these neural reactions are exaggerated (i.e., greater activation in the precuneus and greater deactivation in the VPC) when participants take a first- rather than third-person perspective of characters (Brown et al., 2019). Such activation, particularly during first-person perspective taking, is thought to create a relatively strong challenge to individuals' self-identity, as their imagination works to encode information about others into a new and different self-perception (Brown et al., 2019).

Prior research by Brown et al., (2019) has demonstrated that to maintain a state of seeing oneself as a target person (i.e., to engage in first-person perspective taking), individuals are required to shift their focus from their own-self information to information about a target person. As described previously, such shifting requires heightened neural activity associated with creativity and imagination, thought to promote the encoding of information about others into the self (Batson et al., 1997b; Brown et al., 2019; Gerace et al., 2013; Ruby & Decety, 2013). Specifically, during perspective taking, the perspective taker is thought to be the “embodiment of [a] character” which is “akin to a deliberate process of possession...[or] a substitution of the actor's self by the character” (Brown et al., p. 16). It is this process of substituting a perspective taker's self with the character that creates a neural environment where self-perceptions are thought to be malleable.

If first-person perspective-taking activates neural activity for creativity and imagination that allows self-perceptions to be vulnerable to change, it is possible that perspective taking can (positively or negatively) affect individuals' *subjective* self-perceptions. However, no research besides the neurological work described previously has examined if perspective-taking can alter individuals' self-perceptions, for better or for worse.

### Current Study

The purpose of the current study was to examine if individuals' self-perceptions could be modified by taking others' perspectives, particularly the perspective of well-known characters (i.e., first-person perspective of a superhero or supervillain or third person perspective of superhero or supervillain). It was hypothesized that individuals who take the first-person perspective of a superhero would report positive changes in their self-perceived morality and helpfulness across time, whereas individuals who take the first-person perspective of a supervillain would report negative changes in their self-perceived morality and helpfulness across time (compared to taking a third person perspective of

superhero or supervillain; control conditions). Since perspective-taking is a common tool used by many individuals in their daily lives, it is important to examine if (and the extent to which) taking on the perspective of another alters how individuals view themselves.

## Method

### Participants

Participants included 106 undergraduate students (26 men, 81 women, 9 non-binary), ranging in age from 18 to 24 ( $M = 19.25$ ,  $SD = 1.08$ ), of varying races/ethnicities [96 White (88.1%), 5 Multi-racial/Multi-ethnic (4.6%), 4 Asian (3.7%), 2 Black or African American (1.8%), 1 Hispanic (0.9%), and 1 preferred not to respond (0.9%)] from a private midsized university in the Midwest. All participants provided informed consent prior to taking part in the study, which was conducted online using Qualtrics survey software and, therefore, completed at a time and location convenient to the participant.

### Design

The study was conducted as a pre-test/post-test independent-groups design, with one between-groups independent variable (i.e., Perspective Taking: First-Person Superhero Perspective, First-Person Supervillain Perspective, Third-Person Superhero Perspective, or Third-Person Supervillain Perspective). The dependent variables were the change (from pre-test to post-test) in participants' self-perceived morality and helpfulness.

### Materials

#### *Perspective-taking*

A perspective-taking task adapted from Nelson and Norton (2005) and further inspired by Brown et al.'s (2019) work priming superhero exemplars, asked participants to identify ten traits describing *either* a superhero or supervillain (e.g., a superhero is courageous, a supervillain is mischievous, respectively; see Appendix). Participants were given popular DC and Marvel Comic characters as examples (e.g. superhero: Superman, Batman, Spider-Man, Wonder Woman; supervillains: The Joker, Dark King, Magneto, Catwoman, Thanos). A random third of participants simply identified ten traits describing either a superhero ( $n = 19$ ) or supervillain ( $n = 18$ ) and these participants

reflected those in the third-person perspective (control) conditions ( $n = 37$ ).<sup>1</sup> The remaining participants ( $n = 72$ ) completed an additional task where they either took the first-person perspective of a superhero ( $n = 36$ ) or supervillain ( $n = 36$ ) by *applying* each of the ten identified traits to *themselves* (i.e., typing out each trait in a sentence with the pronoun "I"; e.g., I am courageous or I am mischievous, respectively).

#### *Self-Perceived Morality and Helpfulness*

A 20-item questionnaire, adapted from Jordan et al.'s (2015) Moral and Self-Image scale, assessed participants' self-perceived morality and helpfulness. The questions were revised to ask participants to rate the degree to which they perceive themselves to possess 10 morality-specific traits and 10 helpfulness-related traits; the original Moral and Self-Image scale asked participants to rate the degree to which they possess the traits *relative to the person they wanted to be*. Participants completed the measure before (pre-test) and after (post-test) taking the first-person perspective of either a superhero or super villain, or taking the third-person perspective of a superhero or supervillain. The order of questions were randomized at post-test, such that the order was different from pre-test. Participants respond to each question using a 7-point Likert-type scale ranging from 1 (e.g., *I am never caring*) to 7 (e.g., *I am always caring*). Scores on each subscale – Morality and Helpfulness – were averaged at pre- and post-test, with higher scores reflecting greater self-perceived morality ( $\alpha = .731$  and  $\alpha = .817$ ) and helpfulness ( $\alpha = .607$  and  $\alpha = .635$ ), respectively. The original Moral and Self-Image scale has strong psychometric properties (see Jordan et al., 2015), as demonstrated by relatively high coefficients for internal consistency.

#### **Procedure**

University IRB approval was obtained prior to conducting the present study. The study was conducted online using Qualtrics survey software and reflected a pre-test/post-test independent-groups design. Prior to participation, participants read an informed consent document. Participants then completed the 20-item Self-Perceived Morality and Helpfulness measure (pre-test; adapted from Jordan et al. 2015) and were randomly assigned, using Qualtrics randomization feature, to one of

<sup>1</sup>We acknowledge the control conditions (i.e., Third-Person Perspective of a Superhero and Third-Person Perspective of a Supervillain) reflected about half the sample size compared to the experimental conditions (i.e., First-Person Perspective of a Superhero and First-Person Perspective of a Supervillain), which violates an assumption for null hypothesis significance testing using the General Linear Model (GLM). Although the GLM is rather robust to violations of its assumptions, results reported below should be interpreted with caution.



four between-subjects conditions: first-person perspective a superhero, first-person perspective of a supervillain, or third-person perspective of either a superhero or supervillain. Immediately after completion of a perspective-taking task, participants re-completed the 20-item Self-Perceived Morality and Helpfulness measure (post-test; adapted from Jordan et al., 2015). We estimate, approximately, 5 to 10 minutes elapsed between the pre-test and post-test measures of participants' self-perceived morality and helpfulness. Subsequently, participants responded to demographic questions assessing their gender, age, race/ethnicity, and year in college. Finally, participants were debriefed and thanked for their involvement in the study.

### Results

To test the hypotheses that participants who took the first-person perspective of a superhero would report positive changes in their self-perceived morality and helpfulness, whereas individuals who took the first-person perspective of a supervillain would report negative changes in their self-perceived morality and helpfulness (compared to taking a third person perspective of a superhero or supervillain; control conditions), separate 2 (Self-Perceived Morality or Helpfulness: pretest, post-test) x 4 (Perspective Taking: First-Person Superhero Perspective, First-Person Supervillain Perspective, Third-Person Superhero Perspective, Third-Person Supervillain Perspective) mixed-design analyses of variance (ANOVAs) were conducted.

#### Self-Perceived Morality

The main effect of Time (pre-test to post-test) was not significant, revealing that participants' self-perceived morality did not change from pre-test ( $M =$

5.34,  $SD = .63$ ) to post-test ( $M = 5.33$ ,  $SD = .73$ ),  $F(1, 105) = 0.92$ ,  $p = .76$ . This result demonstrates that time alone was not responsible for changes in individuals' self-perceived morality. The main effect of Perspective Taking was also not significant, revealing that participants who took the first-person perspective of a superhero ( $M = 5.48$ ,  $SD = .60$ ) did not differ significantly in their self-perceived morality from participants who took the first-person perspective of a supervillain ( $M = 5.17$ ,  $SD = .70$ ) or participants who took the third-person perspective of a superhero ( $M = 5.44$ ,  $SD = .62$ ), or supervillain ( $M = 5.27$ ,  $SD = .73$ ),  $F(1, 105) = 1.54$ ,  $p = .21$ . However, importantly, and consistent with prediction, the interaction between Perspective Taking and Time (pre-test to post-test) was significant,  $F(3, 105) = 3.02$ ,  $p = .03$ . As seen in Figure 1, post hoc paired samples  $t$ -test for each Perspective Taking condition (i.e., First-Person Superhero Perspective, First-Person Supervillain Perspective, Third-Person Superhero or Supervillain Perspective) revealed that individuals' self-perceived morality *tended to* (but did not reach traditional levels of significance) increase when taking the first-person perspective of a superhero,  $t(35) = -1.80$ ,  $p = .08$ , whereas individuals' self-perceived morality tended to decrease when taking the first-person perspective of a supervillain,  $t(35) = 1.78$ ,  $p = .08$ . In contrast, participants who took the third-person perspective of a superhero or supervillain did not experience any change in their self-perceived morality,  $t(18) = 1.15$ ,  $p = .265$  and  $t(17) = -.61$ ,  $p = .552$ , respectively.

#### Self-Perceived Helpfulness

The main effect of Time (pre-test to post-test) was not significant, revealing that participants' self-perceived helpfulness did not change from pre-test ( $M =$

Measure	Pretest	Post-test
Superhero First-Person	5.43 (.61)	5.53 (.64)
Supervillain First-Person	5.22 (.66)	5.11 (.79)
Third-Person Superhero	5.47 (.57)	5.41 (.68)
Third-Person Supervillain	5.26 (.70)	5.28 (.77)

**Table 1**

*Means (and Standard Deviations) Associated with the Interaction of Perspective Taking and Time on Individuals' Self-Perceived Morality*

Measure	Pretest	Post-test
Superhero First-Person	5.22 (.56)	5.53 (.59)
Supervillain First-Person	5.13 (.73)	5.02 (.76)
Third-Person Superhero	5.08 (.59)	5.02 (.55)
Third-Person Supervillain	4.93 (.73)	4.95 (.77)

**Table 2**

*Means (and Standard Deviations) Associated with the Interaction of Perspective Taking and Time on Individuals' Self-Perceived Helpfulness*

4.98,  $SD = .61$ ) to post-test ( $M = 4.99$ ,  $SD = .64$ ),  $F(1, 105) = 0.002$ ,  $p = .96$ . Consistent with findings for self-perceived morality, this result demonstrates that time alone was not responsible for any change in individuals' self-perceived helpfulness. The main effect of Perspective Taking was also not significant, revealing that participants who took the first-person perspective of a superhero ( $M = 5.05$ ,  $SD = .47$ ) did not differ significantly in their self-perceived helpfulness from participants who took the first-person perspective of a supervillain ( $M = 4.90$ ,  $SD = .70$ ) or participants who took the third-person perspective of a superhero ( $M = 5.05$ ,  $SD = .56$ ) or supervillain ( $M = 4.94$ ,  $SD = .75$ ).  $F(3, 105) = 0.44$ ,  $p = .73$ . However, consistent with prediction, the interaction between Perspective Taking and Time (pre-test to post-test) was significant,  $F(3, 105) = 7.74$ ,  $p < .001$ . As seen in Figure 2, post hoc paired samples  $t$ -tests for each Perspective Taking condition (i.e., First-Person Superhero Perspective, First-Person Supervillain Perspective) revealed that individuals' self-taking the first-person perspective of a superhero,  $t(35) = 3.22$ ,  $p = .003$ , whereas individuals' self-perceived helpfulness decreased among participants taking the first-person perspective of a supervillain,  $t(35) = 2.85$ ,  $p = .007$ . In contrast, participants who took the third-person perspective of a superhero or supervillain did not experience any change in their self-perceived helpfulness,  $t(18) = 1.102$ ,  $p = 0.29$  and  $t(17) = -.62$ ,  $p = .54$ , respectively.

### Discussion

Given very few studies have examined if perspective taking can change individuals' self-perceptions, the current study adds value to the literature by examining if participants' self-perceptions could be modified by taking the perspective of well-known characters (i.e., first-person perspective of superhero or supervillain or third-person perspective of superhero or supervillain). The results were generally consistent with the hypotheses, revealing participants experienced changes in their self-perceived level of morality – and to some degree their helpfulness – after taking the first-person perspective of a superhero or supervillain (but not after taking the third-person perspective of either a superhero or supervillain).

When individuals took on the first-person perspective of a superhero (i.e., imagining themselves as the superhero), they experienced a positive change in their self-perceived helpfulness and – although post hoc tests did not reach traditional levels of significance – their self-perceived morality. In contrast, when participants took the first-person perspective of a supervillain (i.e., imagining themselves as the

supervillain), they experienced a negative change in their self-perceived helpfulness and – again, although post hoc tests did not reach traditional levels of significance – their self-perceived morality. As expected, there was no change in participants' self-perceived helpfulness or morality after taking on the third-person perspective (control) of either a superhero or a supervillain (i.e., thinking about superheroes or supervillains generally).

These results support findings by Meyer et al. (2019) who revealed that perspective-taking is associated with brain activity that may make self-perceptions malleable. However, the effects of perspective taking on individuals' self-perceptions were clearly more robust for their self-perceived helpfulness than morality. Specifically, post hoc analyses testing if perspective taking affected individuals' self-perceived *morality* did not reach traditional levels of significance ( $ps = .08$  rather than  $\leq .05$ ), yet examination of the means and standard deviations suggests that with more participants – and, therefore, greater power to find a true effect if it exists – the effects may be present. By increasing sample size, future research may be more likely to demonstrate that the effect of perspective taking on individuals' self-perceived morality is unlikely to occur by chance. However, if future research fails to find such an effect, one possible explanation may be that perspective taking may have a stronger impact on characteristics perceived more concretely – such as helpfulness in the current study – rather than characteristics perceived more abstractly – such as morality in the current study. Because the construct of morality is considered abstract and complex (see Romera et al., 2019), it is possible that it may be more challenging to modify through perspective taking.

Overall, the implications associated with the current study's findings are important. For example, because perspective taking tends to be a common tool used in many people's daily lives (Gerace et al., 2013) – particularly college students as their identity and sense of self develops through learning about the diverse world – frequent and persistent perspective-taking *could* have negative effects on their wellbeing. If individuals continually take the perspective of depressed, dejected, or otherwise, unwell others, the individuals may, themselves, begin to feel depressed, dejected, and unwell. However, conversely, frequent and persistent perspective-taking *could* also have *positive* effects on individuals' wellbeing. That is, if individuals continually take the perspective of prosocial, generous, or otherwise, kind others, the individuals may, themselves, begin to feel (and hopefully be) prosocial, generous, and kind. Although such implications are intriguing, the power of

perspective taking is likely not so simple. Because individuals likely engage in many instances of perspective taking each day, reflecting both good *and* bad situations, much additional research is needed to understand the extent to which perspective taking can and does change individuals' self-perceptions, and for how long.

### Limitations and Future Directions

The present findings add to the limited extant literature examining if perspective-taking affects individuals' self-perceptions. Results revealed that individuals' self-perceptions tended to change (marginally for morality and rather robustly for helpfulness) after first-person perspective taking. Although the current study has many strengths, there are limitations that provide meaningful and direct ideas for future research. Specifically, the current study was designed to test the *immediate* effects of perspective-taking on individuals' self-perceptions and does not offer insight into the potential long-term effects. Consequently, future research should be conducted to examine if perspective taking results in temporary changes in self-perceptions or if (and under what conditions) self-perceptions can be completely altered through perspective-taking. Because there is no literature – that we are aware of – examining the short- or long-term effects of perspective-taking on individuals' self-perceptions, such research could be fruitful. Additionally, although potentially ethically difficult, future research could examine if repeated experiences with perspective-taking can permanently altered individuals' self-knowledge.

### Conclusion

The purpose of the current study was to examine if participants' self-perceptions could be modified by taking the perspective of characters in either the first- or third-person. Participants were randomly assigned to take the first-person perspective of either a superhero or supervillain and their self-perceived morality and helpfulness were measured prior to and after the activity. Consistent with hypotheses, participants who took the first-person perspective of a superhero, self-perceived helpfulness – and to some degree morality – was *higher* on post-test than pre-test, whereas, when participants took the first-person perspective of a supervillain, self-perceived helpfulness – and to some degree morality – was *lower* on the post-test than pre-test. These findings provide some support for the claim that taking the perspective of a character can change how people see themselves – and such findings have meaningful implications for human behavior. Despite the importance of studying perspective taking on individuals' self-perceptions, the study relied on a cross-sectional sample

– of relatively few individuals – from a private university in the Midwest. Although the current study is limited by its recruitment of college students, the study makes a meaningful contribution to the literature examining how perspective taking may modify individuals' self-perceptions.

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**Appendix**  
**Perspective Taking Task**

**First-Person Perspective of a Superhero**

INSTRUCTIONS: For this task we would like you to describe ten characteristics of superheroes (e.g., Superman, Batman, Spiderman, Wonder Woman). As you think about superheroes, list the characteristics, behaviors, values, lifestyle, and appearance associated with these characters.

Example: A superhero is strong.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

INSTRUCTIONS: Now take a moment to re-write each of the characteristics described above imagining that you have these traits and are similar to superheroes.

Example: I am strong

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**First-Person Perspective of a Supervillain**

INSTRUCTIONS: For this task we would like you to describe ten characteristics of supervillains (e.g., The Joker, Dark King, Magneto, Catwoman, Thanos). As you think about supervillains, list the characteristics, behaviors, values, lifestyle, and appearance associated with these characters.

Example: A supervillain is strong

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Now take a moment to re-write each of these characteristics described above imagining that **you** have these traits and are similar to supervillains.

Example: I am strong

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Third-Person Perspective of a Superhero (Control condition)**

INSTRUCTIONS: For this task we would like you to describe ten characteristics of superheroes (e.g., Superman, Batman, Spiderman, Wonder Woman). As you think about superheroes, list the characteristics, behaviors, values, lifestyle, and appearance associated with these characters.

Example: A superhero is strong.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Third-Person Perspective of a Supervillain (Control condition)**

INSTRUCTIONS: Now take a moment to describe ten characteristics of supervillains (e.g., The Joker, Dark King, Magneto, Catwoman, Thanos). As you think about supervillains, list the characteristics, behaviors, values, lifestyle, and appearance associated with these characters.

Example: A supervillain is strong.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

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