

UNIVERSITY OF CALIFORNIA, BERKELEY

VOLUME XIII



THE UNDERGRADUATE JOURNAL OF

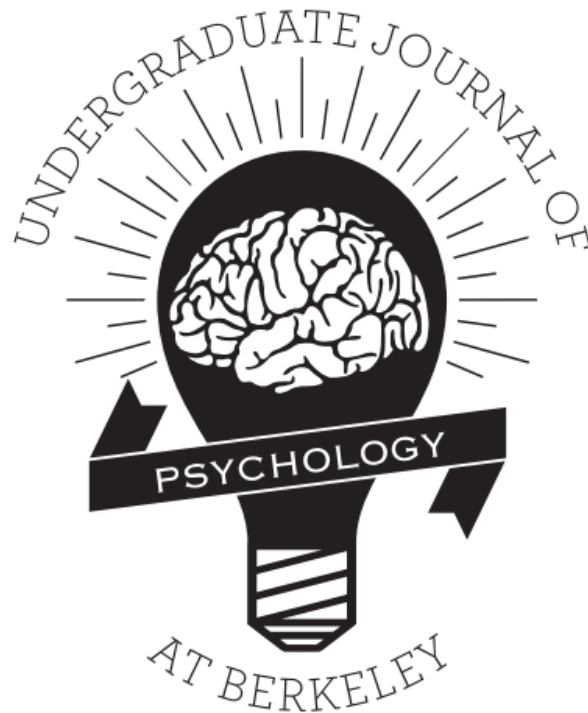
PSYCHOLOGY

AT BERKELEY

THE UNDERGRADUATE JOURNAL OF

PSYCHOLOGY

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UNIVERSITY OF CALIFORNIA, BERKELEY

VOLUME XIII | Fall 2019 - Spring 2020

This publication and prior editions are available online at www.ujpb.org

Cover Image: The Laboratory of Neuro Imaging and Martinos Center for Biomedical Imaging, Consortium of the Human Connectome Project
Collins, F. (2015, October 6). NIH Director's Blog. Retrieved April 25, 2016, from
<https://directorsblog.nih.gov/2015/10/06/making-the-connections-study-links-brains-wiring-to-human-traits/>

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SPECIAL THANKS TO:

Website Manager : Dixie Waigel
Journal Designer : Katy Kincannon

EDITOR'S NOTE

Welcome to the 13th edition of the Undergraduate Journal of Psychology at Berkeley! Through our publication of this journal, we aim to inspire undergraduate students to produce and consume research.

In this volume, we explore a variety of topics present in the psychological sciences. These articles demonstrate sound research that has been both critically analyzed and carefully applied.

As always, we extend our gratitude to all of the people who make it possible to publish outstanding research. The authors, for granting us the privilege of showcasing their work. Our faculty sponsor, Professor Ann Kring, for providing support and guidance throughout each edition of the journal. Our talented Executive Directors, Jessica Waller and Caitlin Arango, for their excellent leadership. Furthermore, I would like to thank our editors, for their tireless commitment and dedication to producing papers of the highest caliber. Thank you all for your efforts, which lie culminated in the following pages.

It is my sincere hope that our readers will enjoy this edition of our journal.

With gratitude,

Katy Kincannon

Katy Kincannon
Editor-in-Chief



PREFACE

Welcome to the 2020 edition of the Undergraduate Journal of Psychology at Berkeley!

I am delighted to introduce the latest edition of the Undergraduate Journal of Psychology. As Chair of the Department of Psychology at UC Berkeley, it is my privilege and pleasure to work with the student editors who have put together this journal. These editors work together to carefully select and edit articles that reflect the very best of psychological science, and they have done an outstanding job with this edition.

At UC Berkeley, we are committed to supporting and promoting research of the highest quality, in order to understand the brain and mind, personality and social interactions, lifespan development, cognition, and mental illness. The papers in our 13th volume showcase many exciting new findings in different domains of psychology.

Our faculty have the great good fortune to teach and collaborate with a very talented group of undergraduates at Berkeley. Our students not only engage in the intensive study of a problem that reflects their personal interests, but, as important, gain skills in the scientific method. An important part of this skill set is clearly writing about complicated laboratory observations.

Congratulations to all of the participants – contributors and editors alike – who have created another amazing edition of the Undergraduate Journal of Psychology.



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A critical review of Gallup, G. G. (1970). Chimpanzees: Self-recognition. Science, 167 (3914), 86-87

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Gallup (1970) pioneered the mirror self-recognition (MSR) procedure and demonstrated that chimpanzees seemed to exhibit, perhaps the most primitive form of self-awareness, body-recognition. Even since, the MSR has been referred to as an index of self-recognition, allowing an exploratory window to be opened into the self-recognition abilities in animals while drawing the evolutionary path of self-awareness across the animal kingdom. Through a critical evaluation of Gallup's experiment (1970), the essay will argue that although MSR should remain the starting point in the investigation of self-recognition in animals, i) Gallup's statement that only great apes and human possess a self-concept is ill-founded, ii) MSR should not be used as the single measure to test self-recognition and iii) that self-recognition does not necessarily coincide with a self-concept. The essay will also consider future directions such as the need for more neuroanatomical and multisensory studies and will finally consider MSR from an evolutionary perspective and propose its potential purpose(s).

Keywords: Gallup, mirror self-recognition, self-awareness, evolution, animal cognition

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Experimental background

Gallup (1970) introduced the hallmark test to experimentally investigate self-recognition and self-awareness in nonhuman animals. In his study, Gallup observed the behaviours of four chimpanzees in front of mirrors. Initially, the animals would respond to the image reflected in the mirror as if it was a conspecific (another member of the species). Eventually, the social behaviours (e.g. threatening and vocalizing) of the chimpanzees started to shift to self-directed behaviours. They were no longer looking *through* the mirror as if observing another animal, but they started looking *at* the mirror. They started to use the mirror as a *tool* and would observe parts of their bodies otherwise invisible (e.g. mouth, genitals, etc). To

demonstrate that the chimpanzees could recognize themselves, Gallup introduced another condition in which the visual appearance of the animal was changed. The chimpanzees were anesthetized and marked with a red odourless dye on their forehead. After awakening, when looking at the mirror again, they tended to touch the red spot, which was not visible without the mirror. If the chimpanzees had perceived that the reflected image belonged to a different chimpanzee, they would have touched the red mark on the reflected image. The fact that they did not implies that they seemed to hold an internal model of their physical appearance, and that the red mark did not match their knowledge of their body model. That the chimpanzees seemed to appreciate the representational relationship between their bodies and the

mirrors' was used as evidence of self-recognition and the existence of a self-concept (Gallup, 1970).

Methodological Issues

Since Gallup's pioneer work, many studies have replicated the MSR to demonstrate self-recognition in bonobos (Hyatt & Hopkins, 1994), orangutans (Suarez & Gallup, 1981), elephants (Plotnik et al., 2006), dolphins (Reiss & Marino, 2001) and killer whales (Delfour & Marten, 2001). The recognition of one's self in the mirror has been used as evidence of the existence of self-awareness, which Wise (2010) considers a criterion for personhood. The existence of a cognitive gap separating humans and great apes from the rest of the animal kingdom was put forward as the natural conclusion for the apparent lack of MSR among other animals, such as macaques (Gallup, 1970). Yet, this "anthropocentric assumption" (Schilhab, 2004) seems ludicrous in regards to current empirical findings. While not all great apes have passed the MSR test, other non-human animals *have* successfully passed, suggesting the need for re-evaluation of Gallup's claim (1970).

Regardless of their phylogenetic affinity to both humans and other great apes, gorillas rarely demonstrate the capacity for self-recognition (Parker, Mitchell et al., 1994). In stark contrast, the phylogenetic dissimilarity of pigeons and fish with humans is not indicative of their capacity for MSR. In reality, applying the exact *same* procedure to a wide range of *different* species calls into question the validity of the test. For instance, regarding the absence of MSR success among gorillas, Patterson & Cohn (1994) posit that their failure may be due to gorillas' aversion to direct eye contact, preventing them from exploring the reflected image. Thus, failing the test may not demonstrate a failure to self-recognize or to explicitly demonstrate self-awareness; rather it may outline a failure of learning and performance.

The need for alternative methods

If an animal does not understand the mirror's properties, it will not be able to use it as a tool and consequently will fail to *learn* and appreciate the duality of the mirror images. Chang et al. (2017) overcame this issue by allowing rhesus monkeys to actively learn about mirrors. Whereas studies had previously shown that monkeys failed the MSR, Chang et al., (2017) demonstrated that they would eventually pass the test after a period of training. This emphasizes the importance of an appropriate environmental and learning history in order for an individual to exhibit MSR.

Nevertheless, it remains puzzling why the MSR remains the gold-standard procedure, even across species, considering the vast repertoire of behavioural capacities within the animal kingdom. While the test has been designed to meet the behavioural catalogue of both primates and humans (Gallup, 1970), animals that are not able to physically touch the dye-mark remain poor test candidates. This further complicates the comparison between them and other vertebrates (Bekoff & Sherman, 2004) and outlines the necessity to employ alternative methods, which may facilitate the identification of false negatives.

Although the method introduced by Gallup has served as the starting point for empirically demonstrating self-awareness in animals, it is unfortunate that most modern research has been canalized into relying on this procedure. The limitations of the MSR are not about the MSR as a measure but rather about it being *the* measure for investigation of self-recognition and, consequently, self-awareness. For instance, Couchman (2012) demonstrated rhesus monkeys' capacity for self-awareness by showing that they were able to distinguish between a computer pointer that they had controlled, with a pointer controlled by others. Rather than testing self-recognition to infer the presence of self-awareness, this study used self-agency, the awareness that some actions are

self-generated, as evidence of self-awareness in rhesus monkeys.

MSR relies too heavily on visual cues (Schilab, 2004) and therefore fails to bestow equivalent importance to other sensory modalities. Some species may be more attentive to auditory or olfactory cues. One example is dolphins' use of a unique "signature whistle" to communicate their identity to others (Janik et al., 2013). This auditory cue implies that dolphins can distinguish themselves from others, which suggests the presence of some primitive self-concept. In the same vein, Horowitz (2017) argues that dogs dedicate more time investigating a container of their own odour which had been laced by another dog's odour. This means that they are able to recognize their own odour and therefore know when this odour has been modified by another dog's nearby presence. Similarly, Bekoff (2001) demonstrated that dogs could differentiate their own urine from other dogs', outlining that the investigation into animals' self-awareness should not be limited to visual cues but could benefit from auditory and/or olfactory test procedures.

When considering the cognitive behavioural differences inherent to some species, and subsequently adopting alternative methods, self-recognition in the animal kingdom appears to "extend below man and the great apes" (Gallup, 1970) as opposed to what was inferred in the initial study.

Self-Recognition vs Self-Awareness

Even when controlling for methodological issues and adapting the test to the biological-behavioural capacities of individual species, issues of interpretation remain. Understanding the link between self-recognition and self-awareness is challenging. Gallup (1970) equates self-recognition with self-concept and awareness with no explicit rationale for doing so and without any purposeful conceptualisation of what these terms mean. Self-recognition refers

to the ability to acknowledge oneself. This supposes the existence of a pre-existing knowledge of oneself (self-concept), which is revisited with the mirror image. On the other hand, self-awareness is to be aware of one's self as an individual, and to be *aware of this awareness* (Snodgrass & Thompson, 1997). In fact, Cunningham & Glenn, (2004) showed that although 96% of the participants with Down syndrome were able to pass the mirror test, only 57% of them were aware of their disability. This suggests that a distinction between self-recognition and self-awareness is needed, and that they should not be used interchangeably. The crucial difference is that self-recognition relies on the external aspects of the "individual" such as the physical appearance, and that self-awareness is "a sense of continuity, a sense of personal agency and a sense of identity" (Gallup, 1998) which thus not only tackles external but also internal aspects of the individual. While it is likely that MSR entails some aspects of self-awareness, it is also very unlikely that they may be used interchangeably. Self-awareness entails public, as well as private, dimensions (mental states, etc) of what makes an individual unique (Morin, 2011) whereas MSR possibly only rely on the public dimensions: in other words, it could involve nothing else than a concept of one's body - which is a strictly public self-aspect.

Furthermore, even if it is assumed that passing the MSR test may sometimes indicate the presence of self-awareness, with regards to observable "successes" in other species, how "can we assume that equivalent behaviours represent equivalent underlying cognitive processes?" (Kohda et al., 2018). Kohda et al., (2018) demonstrated that cleaner wrasse were able to pass the MSR test. They observed that, when marked on the throat, the frequency of scraping behaviours in the fish was considerably increased, suggesting attempts to remove the mark as if it was a parasite. The fact that the fish displayed behaviours that are congruent with self-recognition raises issues of

interpretation: should the behaviour be taken as evidence for self-recognition or may these behaviours be explained by other cognitive processes which do not involve self-recognition capacities?

With regards to Morgan's (1894) canon "In no case is an animal activity to be interpreted in terms of higher psychological processes if it can be fairly interpreted in terms of processes which stand lower in the scale of psychological evolution and development," the implications of Kohda et al. (2018)'s findings sheds light on the difficulties surrounding mentalistic concepts, i.e., that self-recognition necessarily implies an "advanced form of intellect" (Gallup, 1970).

Alternative Interpretations

There are numerous ways in which MSR may be explained without any reference to mental capacities (Schwenkler, 2008). Supporting evidence can be found in studies involving human children: although 18-24 months old children typically demonstrate self-recognition in front of mirrors, when infants watched videos of them being marked on the face, they were subsequently unable to use this information to find the mark on their own face (Povinelli, 2001). This either implies that they are only able to exhibit self-recognition capacities under certain specific conditions (e.g. with a mirror) or that they possess behavioural skills (e.g. kinaesthetic-visual) allowing them to act *as if* they could recognize the reflected image as their own. The fact they could pass the MSR but failed the video task reveals that MSR does not imply a robust self-concept. In animals as well, the apparent MSR can be explained in simpler ways. Animals may pass the MSR through a kinaesthetic-visual matching mechanism (Mitchell, 1997), relying on correlations between their movements and the visual feedback from the mirror. This provides an explanation which does not require complex cognitive abilities, hence arguing against a mentalistic interpretation.

According to Perner (1991) and Suddendorf (1999), passing the mirror test does not necessarily imply self-recognition nor self-awareness; rather it may hinge on knowledge one's own physical appearance and may thus signify possession of "an internal model of our appearance (note: and not on one's self) that can be updated" (Suddendorf & Butler, 2013). Indeed, Nielsen et al., (2006) support such suggestions. Human infants were seated on a chair, which prevented them from seeing their legs. To differentiate whether self-recognition was achieved by Mitchell's (1997) proposal of kinaesthetic-visual matching or by appearance matching, participants were changed into new pants (that they had no opportunity to view). In this condition, when seeing a mark on their legs in the mirror presented in front of them, the infants did not perform any self-directed behaviour. When the participants were given the opportunity to look at the new pants for 30 seconds, they exhibited mark-directed behaviours during the mirror test. Such results were taken as evidence that Mitchell's (1997) interpretation of the MSR is not sufficient to pass the test. Rather, the individual does need to hold an internal image of what they *currently* look like to then match to the external mirror image. Unfortunately, no experiment of this nature has been performed on non-human primates. It would, however, be very interesting to observe if similar patterns of behaviour exist beyond humans, and whether it is possible for other species to update their expectations of current appearance (e.g. with human infants, 30 seconds was sufficient).

Although evaluating each of the many allegations against Gallup's (1970) goes beyond the scope of this paper, what these suggest is that there are many different interpretations of Gallup's findings (1970). Yet, the existence of a rich corpus of alternative explanations not only challenges the mentalistic explanation but also encourages researchers to improve their testing methods, thereby significantly accelerating the

exploration of self-recognition in animals. It follows that mirror-based tests of self-recognition should be directed away from Gallup's (1970) mentalist interpretation. Although the involvement of certain cognitive abilities for MSR should not be completely ruled out, a more careful conceptualization of "self-concept" or "idea of me" (Lewis, 1992) is needed.

Future directions

With regards to Bertenthal & Fisher (1978)'s claim that "self-recognition develops gradually," it is unfortunate that Gallup (1970) failed to consider the existence of "partial accomplishments" (Courage et al., 2004). Indeed, Gallup (1970) refers to a self-concept as an all-or-nothing phenomenon, i.e., animals that pass the MSR possess a self-concept and those who do not are "mindless" (Gallup, 1982). However, this interpretation overlooks a crucial point: the absence of evidence does not necessarily equate to evidence of absence. Though passing the MSR test may involve some form of self-awareness, failing to do so does not necessarily exclude the existence of other forms of self-awareness. Gallup's view is rather reductionist and fails to appreciate the multifaceted nature of conceptual self-awareness. Failing to support his views with appropriate theoretical background, Gallup's interpretation of MSR, as it relates to higher cognitive abilities, should be considered assumptions rather than conclusions.

To draw a more accurate evolutionary picture of self-awareness, MSR should no longer be used to answer "does MSR imply self-awareness?" but rather "what levels/degree of self-recognition and self-awareness are involved in MSR?". Future work should therefore focus on implementing the MSR test in conjunction with other methods of testing self-recognition. Combining a wide array of methods, such as experiments investigating the existence of self-agency and/or the other modalities involved in self-recognition (e.g. smell), would enable the

exploration of "partial accomplishments" and would create a more detailed representation of the different potential levels of self-recognition. Moving away from the visual modality may allow for acknowledgement of the hierarchical architecture of self-recognition. The potential ability of some species to recognize themselves using olfactory cues but fail to do so using visual or auditory information, could suggest the existence of separate sensory self-concept, as advanced by Gallup & Anderson, (2018). This would mean that in order to understand self-recognition across the animal kingdom, one would need to elucidate the existence or absence of each sensory aspect, such as an auditory self, a visual self and an olfactory self as well as how these concepts are linked together.

In addition to the investigation of potential "sub-parts" of self-recognition, a holistic understanding of self-recognition should be utilized by obtaining and incorporating neuroanatomical data. While the neural correlates of self-recognition in humans have been intensively studied, there has only been little research on non-human primates. Hetch et al., (2017) studied the correlation between chimpanzee individual differences in the MSR test and superior longitudinal fasciculus (SLF, white matter pathway linking frontal and parietal regions) using fMRI. They found a positive correlation between extension of SLFIII into the prefrontal regions of the inferior frontal gyrus and the ability to pass the MSR test. This was taken as evidence that such prefrontal extension of SLFIII may be the driving force behind MSR ability. This may be explained by the fact that passing the MSR test involves correlating voluntarily self-produced movements with those observed in the mirror. While producing movements requires the descending activity from prefrontal to premotor to primary motor cortex (Badre & D'Esposito, 2009), observing movements involves both proprioceptive and visual input sent into these same frontal and parietal regions. For

successful self-recognition to be achieved, these two pathways of information need to be united; the SLF is required for a successful integration of these two streams of information.

Although the study of the neuroanatomical aspect of self-recognition provides great insights, interpretation remains limited by the correlational nature of the data. Another vital aspect of self-recognition are the potential evolutionary benefits associated with this complex ability. Whether self-recognition has been selected as a result of environmental and social pressures or if it is merely a “spandrel”, a by-product of evolution remains unclear. If a positive correlation between the level of self-recognition and the phylogenetic similarity with humans is found, this would support the view that self-recognition is evolutionary derived and that it may well be associated with specific advantages.

While there is still no consensus regarding the benefits of self-recognition, some argue that its importance lies in the fact that it allows one to manipulate the most crucial resource there is: oneself. Being able to recognize oneself presupposes the ability to see oneself as an independent entity from the world. Appreciating this distinction might enable the use of one's own body as a tool to advance their own interests. On the other hand, though self-recognition may be associated with such abilities, it may not be a definite requirement for the capacity for enabling individuals to put themselves “first”. It remains unlikely to see a non-human animal spend energy on another individual but themselves, which may suggest the existence of an understanding of oneself as independent from the others without necessitating the existence of self-recognition. In this way, while many species seem to appreciate, at some levels, that they are independent individuals, those with self-recognition may rather hold a more advanced higher-order understanding of this “independence.”

More specifically, self-recognition may actually be at the origin of the ability that one has to act upon its environment. The crucial distinction is that the ability to perceive oneself as independent may not translate into a conscious ability to understand the relationship one has to others. To illustrate this difference, a comparison between reptilian and mammalian behaviours may shed light on the understanding of the “self”. According to Porges (2011), reptiles are passive feeders that only feed when food is available. When there is no food present, their brain reduces metabolic demands, making the unavailability of food less detrimental. On the other hand, mammals are active dynamic feeders; when there is no food available, they will explore and act upon their environment. To explain the shift from the reptilian to the primate brain, Porges (2011) uses the following metaphor of the garden of Eden: “In the garden, food is available but there is no awareness of the self. When we leave the garden, we must search for food and we are aware of self. This is the forbidden knowledge.” What this seems to suggest is that the benefits of self-recognition may not be limited to the perception of oneself as an individual. Rather, the main evolutionary advantage may be associated with the ability that one has to *actively* interpret, act upon, and change its environment.

Conclusion

In conclusion, Gallup (1970)'s seminal study has introduced a method of exploring animals' capacities for self-recognition. However, self-awareness research in animals has been canalized into utilizing MSR as *the* single measure. Evidence of self-awareness as a multidimensional phenomenon highlights the need for multi-methods studies, in order to enable researchers to examine various levels and categories of self-concept and control for false negatives. Although numerous methodological and interpretative limitations ought to be outlined in Gallup's study (1970),

such caveats also contribute to the enormous impact of his experiment, motivating researchers to find alternative methods and explanations in the effort to understand self-awareness in the animal kingdom and its evolutionary basis. Gallup's MSR test should remain a measure to test self-recognition; however, rather than maintaining its role as the dominant measure, it should be seen as complementary to studies involving others sensory modalities.

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Comparative Study on the Effects of Stimulant and Non-Stimulant ADHD Medication in Children and Adolescents

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This study compared stimulant, methylphenidate and amphetamine medication with non-stimulant, atomoxetine medication. Both types of medications are commonly used for children with Attention Deficit Hyperactivity Disorder (ADHD). A literature review was conducted to examine the chemical structural and psychological pathways, as well as the effects of each drug on children with ADHD. While stimulants affect the subcortical and cortical regions of the brain, non-stimulants only affect the cortical areas. Differences in neural pathways between the two types of drugs are related to a variety of negative side effects in children that could impact their quality of life. Possible side effects of stimulants include stunted growth, though research in this area is inconclusive. Further testing of side effects is necessary for a concise understanding of the relationship between growth and stimulant use. Non-stimulants are comparatively newer than stimulants but have a lower effect size and require longer treatment periods. In conclusion, the side effects of both stimulants and non-stimulants should be further investigated, and it is suggested that future research should re-evaluate current guidelines for ADHD for effective treatment of children with ADHD in order to minimize side effects.

Keywords: DHD, ADHD medication, stimulants, non-stimulants

Acknowledgements: I would like to extend my gratitude and respect to Dr. Pamela Seeds, the clinical lecturer of psychology, for sharing her expertise and experience in clinical psychology that facilitated and guided the research on this project.

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Attention Deficit Hyperactivity Disorder (ADHD) is the most commonly diagnosed childhood psychiatric disorder in North America (APA, 2013; Centre for ADHD Awareness Canada, 2017). A survey conducted by the American Psychiatric Association in 2013 suggested that approximately 5% of children in the United States have ADHD; however, other studies suggested a higher prevalence of 8% (APA, 2013; CDC, 2017; CDC, 2018; Faraone et al., 2003). The diagnostic prevalence of ADHD has been on

the rise. A recent study analyzed the frequency of ADHD diagnosis of children and adolescents in four provinces in Canada from 1999 to 2012 (Vasiliadis et al., 2017). The investigation found a near 200% increase in ADHD prevalence in Manitoba and Nova Scotia (Vasiliadis et al., 2017). In Quebec, the prevalence of ADHD in children and adolescents increased by 300% from 1999 to 2012, while Ontario stayed relatively stable (Vasiliadis et al., 2017).

Attention Deficit Hyperactivity Disorder

ADHD is a form of neurobiological mental illness (APA, 2017; CADDAC, 2017). The condition affects multiple areas of the brain, such as decreased volumes in the cerebral cortex, white matter, grey matter, and caudate nucleus (Qui et al., 2010; Wolosin et al., 2009). Significantly decreased volumes in the aforementioned brain regions contribute to reduced cortical folding and inefficient connections between brain regions (Uddin, 2008; Wolosin et al., 2009). The neuroanatomical variations between people with ADHD and control groups were shown to contribute to differences in the resting state, known as the default mode network (Uddin, 2008). Traditionally, it is theorized that structural differences in the brain are associated with lower levels of dopamine, leading to a constant state of low arousal in ADHD populations (Levy, 1991). To counteract low arousal states, people struggling with ADHD often have trouble concentrating and feel the need to be more active (Levy, 1991). The increased activity level stimulates their brains to release more dopamine to achieve the desired arousal state.

These disruptions in the brain could manifest as symptoms of ADHD, such as difficulty staying focused, frequent mind wandering, impulsivity, controlling behaviour, and fidgeting (APA, 2017; Uddin, 2008). Through the identification of different symptoms, ADHD can be categorized into three subtypes: inattention, hyperactive-impulsive, and combined subtypes (Reiersen and Todorov, 2013). While each subtype presents a unique set of challenges, those with ADHD generally struggle with academic achievements, executive dysfunction, and social relationships (Biederman et al., 2004). Additionally, studies have identified a high number of comorbidities associated with ADHD including conduct disorders, learning disorders, and internalizing disorders (Gillberg et al., 2004; Jensen, Martin, and Cantwell, 1997). If treatments and interventions are not

implemented, the life-long effects of ADHD can further impede the intellectual, social, and psychological development of children (Danckaerts et al., 2009; Goswami, 2011; Loe and Feldman, 2007; Peasgood et al., 2016). The first line of treatment for children aged 4-5 is behavioral therapy, followed by a methylphenidate prescription if ADHD symptoms persist (American Academy of Pediatrics, 2011). For children aged 6-18, it is generally encouraged to prescribe both behavioural therapy and methylphenidate first (AAP, 2011).

ADHD Medication

The increase in ADHD diagnosis and prevalence has led to concerns about the over prescription and side effects of ADHD medications (Vasiliadis et al., 2017). However, early intervention and treatment of childhood psychiatric disorders is important; not only could it improve quality of life for the child and their family, but it could also save the government millions of dollars in rehabilitation and supportive housing programs in the future (Jones et al., 2008). By comparing the different types of medications used to treat ADHD, parents, caretakers, and physicians may be better equipped to understand the costs and benefits of each medication.

The standard in the field of clinical psychology has been to use empirically supported interventions that provide the most effective and least harmful treatment to the child and their family (APA, 2017). Common treatments of ADHD include psychotherapy, behaviour therapy, social skills training, family training, and medication (CDC, 2018). ADHD medications are classified into two different categories: stimulants and non-stimulants (CDC, 2018).

Currently, stimulant medications are used as the first line of treatment for ADHD, and it is common for them to be used in conjunction with other forms of psychotherapy (Faraone et

al., 2006). Both stimulants and non-stimulants were proven to be effective at minimizing symptoms of ADHD (Faraone and Buitelarr, 2009; Faraone et al., 2006; Hunt and Marshall, 2012). The first stimulants suitable for treating children with ADHD, methylphenidate and amphetamine, were approved by the United States Federal Drug Administration (FDA) in 1961 and 1937, respectively (Stolberg, 2017). More recently, non-stimulants, such as atomoxetine, were approved by the FDA in 2002 as effective medications for children with ADHD (FDA, 2003).

The use of medication for ADHD has been controversial mainly due to disagreements within the field about the etiology of ADHD (Faraone and Buitelarr, 2009; Faraone et al., 2006; Hunt and Marshall, 2012; Stockl et al., 2003). Some researchers believe that environmental influences are related to the psychological dysfunction in ADHD, and other researchers believe that neurological deficiencies are the culprit. Therefore, the use of medication for ADHD is frequently a topic of debate (Curatolo, D'Agati, and Movero, 2010; Thapar et al., 2012). Concerns over the side effects of medication is often cited as a reason that parents are hesitant to use medication to control their children's ADHD symptoms. Doctors giving ADHD medication to children are often seen as "drugging problematic children" and over-prescribing medication (Vasiliadis et al., 2017).

Since medication use for children with ADHD is controversial, further research on the effects of stimulant and non-stimulant ADHD medication on children and adolescents is needed. This paper will explain the neural pathways that these two medications act upon and how each affects ADHD symptoms. Furthermore, the efficacy, benefits, and side effects will be evaluated and compared between stimulant and non-stimulant ADHD medication. Finally, the paper will address the current use of medication in children and adolescents and discuss why medication and

pharmacotherapy should be a primary treatment in ADHD, as well as suggesting future research directions.

Neural Pathways of Stimulant and Non-Stimulant Medication

To better understand the effects and controversies on different types of medication for children with ADHD, a discussion on the mechanism of action of each type of medication is needed.

Stimulant Medication

Methylphenidate

The most common medication used to treat ADHD in children and adults is a stimulant called methylphenidate (Volkow et al., 2002). Ideal candidates for this medication release normal levels of neurotransmitters, which are chemicals released by neurons that send signals to other areas of the brain but have overactive neuro-transporters which shuttle the neurotransmitters back to the neuron (Swanson et al., 1991; Volkow et al., 2005). The areas of the brain that are supposed to receive the neurotransmitters are now under-stimulated (Volkow et al., 2005). To compensate for the under-stimulation of their brains, it is believed that people with ADHD are hyperactive, which increases stimulation and manifests as a symptom of ADHD (Levy, 1991).

Methylphenidate works by blocking dopamine and norepinephrine transporters in the brain, so the dopamine and norepinephrine neurotransmitters are not reabsorbed and can accumulate in the synaptic cleft (Guzman, 2018; Volkow et al., 2002). This build-up of neurotransmitters such as dopamine and norepinephrine allows the brain to be stimulated and is crucial in decreasing ADHD symptoms (Guzma, 2018). Dopamine and norepinephrine regulate emotions, motivation, behaviour, and concentration through pathways to the prefrontal cortex. The transmission of these neurotransmitters is believed to decrease

symptoms of ADHD (Guzma, 2018; Jaber et al., 1996).

The effect of increased dopamine and norepinephrine allows for increased dopaminergic and non-androgenic activity, which could lead to improved concentration, along with increased behavioral and emotional control (Guzman, 2018; Volkow et al., 2002). This would allow for ADHD patients to experience fewer symptoms that negatively affect their everyday lives. Because the mode of action for methylphenidate is non-discriminatory, the drug blocks dopamine and norepinephrine transporters in both healthy controls and ADHD patients. In a normally functioning person, this increases concentration immensely, causing methylphenidate to be commonly abused as a “study drug” (Linseen et al., 2014; Rapoport and Inoff-Germain, 2002).

Amphetamine

Amphetamine works through a similar mechanism; however, unlike methylphenidate, which requires patients to have normal levels of neurotransmitters, patients with decreased levels of dopamine and norepinephrine are recommended to take amphetamine (Swanson et al., 1991; Volkow et al., 2005). Amphetamine increases the amount of available dopamine by facilitating dopamine release from storage vesicles while also inhibiting dopamine transporters (Daberkow et al., 2013; Richfield et al., 1989; Swanson et al., 1991). Amphetamine facilitates this dopamine release and inhibits transporters, promoting concentration and behavioral control in ADHD patients.

Non-Stimulant Medication

Atomoxetine

Non-stimulant medications, such as atomoxetine, act by inhibiting the reuptake of norepinephrine (Bymaster et al., 2002; Garnock-Jones and Keating, 2009). Compared to stimulants, non-stimulants have a different mechanism of action. Non-stimulants increase

dopamine and norepinephrine levels only in the cortex, while the previously mentioned stimulants increase neurotransmitter levels in both the subcortical and cortical regions of the brain (Bymaster et al., 2002).

After patients with ADHD consume atomoxetine, their dopamine levels increase in the synaptic cleft, which leads to increased activity in the prefrontal cortex, the ventral tegmental area, and the nucleus accumbens (Guzman, 2018; Rawson, 2006). These areas in the brain are critical for controlling higher levels of self-regulation such as emotional regulation and inhibition. In particular, the prefrontal cortex regulates executive functions, such as affect, planning, attention, and behavior. By increasing the activity in the prefrontal cortex, atomoxetine decreases the symptoms of ADHD, allowing for higher productivity (Guzman, 2018; Loe and Feldman, 2007).

Benefits, Efficacy, and Side Effects

Benefits and Efficacy

Non-stimulant medication only affects the cortical regions of the brain, providing several advantages over stimulant medications. Non-stimulant medications are associated with fewer side effects that are commonly associated with stimulants such as addiction and motor tics (Bymaster et al., 2002; Garnock-Jones and Keating, 2009). However, stimulant medications are often the first line of psychopharmaceuticals prescribed for ADHD because of their large effect sizes, despite having more side effects (Budur et al., 2005). Studies suggest that stimulants have a response rate of about 70% to 80%, and an even greater effect size of about 80% to 90%, if both methylphenidate and amphetamine are administered (Arnold, 2000).

While stimulants have a larger effect size than non-stimulants, they may not always be effective in the long term. A study showed that

85% of children adhered to the same medication plan from 3 to 6 years old. During that period, there was a significant increase in the number of patients undergoing combined pharmacotherapy while on stimulant medication (Vitiello et al., 2015). This suggests that while stimulants have a larger effect size initially, other forms of medication are required for long-term maintenance of ADHD symptoms. Since stimulants are associated with numerous side effects, other medications may be administered to combat the initial side effects (Budur et al., 2005; Poulon and Cowell, 2003; Spender et al., 1996). However, the cumulation of the side effects from the initial medications and the secondary medication could increase the risk of drug use discontinuation due to a potential increase in side effects experienced.

Physical Side Effects

Both types of stimulants are associated with negative side effects such as increased heart rate, weight loss, and loss of appetite (Budur et al., 2005). A few studies suggest a correlation between growth delay and ADHD treatment with stimulants. Diverging studies suggest the difference in height and weight is correlated to ADHD but not the stimulant itself (Poulton and Cowell, 2003; Spencer et al., 1996; Swanson et al., 2007). There are notable differences between the two types of stimulant medications. Methylphenidate is usually prescribed to patients with comorbid learning disorders and is associated with side effects such as stomach-aches, depression, and anxiety (Arnold, 2000). In contrast, amphetamine is more effective on patients with comorbid conduct disorders and is associated with side effects such as motor tics and sleep disruptions (Arnold, 2000; Dittman et al., 2013).

Patients with ADHD who have experienced significant negative side effects or do not respond to stimulant medication are often prescribed a non-stimulant (Garnock-Jones and Keating, 2009). Non-stimulant medication, such as atomoxetine, requires 4 to 6 weeks to be fully

effective, whereas stimulants only take up to 1 hour to take effect (Michaelson et al., 2002). The rapid onset of stimulants appears to be more efficient in providing symptom relief, but there are also negative implications. Because addiction is commonly associated with fast acting drugs, stimulant medication is often abused and misused (Lakhan and Kirchgessner, 2012; Winhusen et al., 2011). Furthermore, several studies have shown that non-stimulants have a lower remission rate and better symptom resolutions, while maintaining similar efficacy and higher levels of normal functioning when compared to stimulant participant groups (Hanwella, Senanayake, and Silva, 2011; Steele et al., 2006).

Psychological Side Effects

Physical side effects are not the only concern for patients with ADHD. Psychological side effects have also been identified in previous research, such as obsessive-compulsive side effects in relation to stimulant medications (Firestone et al., 1998; Mayes et al., 1994). Dr. Breggin suggested that the “effects of stimulants are a direct expression of their toxicity,” and the results from research show that both methylphenidate and amphetamine stimulants increased obsessive-compulsive behaviour in over 50% of participants with ADHD compared to the placebo (1999; Borcharding et al., 1990). Researchers observed that participants presented tics, over focusing, and repetitive behaviours (Borcharding et al., 1990). Other psychological side effects were also observed in some children, such as irritability, depressive symptoms, insomnia, and aggressive behaviour (Breggin, 1999; Maye et al., 1994). A recent study showed that over 90% of participants using stimulants cited psychological side effects as one of the reasons for drug discontinuation (Toomey et al., 2012).

Not only are psychological side effects a threat to drug discontinuation, but they also pose the risk of increasing the number of medications

children take. Because stimulant medication is correlated with an increase in psychological side effects, it could manifest in a worsening of the child's condition (Breggin, 2000). For example, a psychological side effect of stimulant medications is depressive-like symptoms, as previously mentioned; as a result of this side effect, the patient would be prescribed an antidepressant (Breggin, 2001). Antidepressants have their own suite of side effects that may further discourage drug adherence.

Currently, there are limited studies on the psychological side effects of non-stimulants. However, a recent study showed convincing evidence that when children switched from methylphenidate to atomoxetine, there was a decrease in the aforementioned psychological and physical side effects and drug noncompliance (Warrer et al., 2016). This could be because non-stimulants have a less disruptive mechanism, since they only affect the number of neurotransmitters in the cortex. In comparison, stimulants affect both the subcortical and cortical areas of the brain (Bymaster et al., 2002). Subcortical areas of the brain are responsible for many tasks essential to survival, such as breathing, homeostasis, and the sleep-wake cycle; therefore, non-stimulants that do not affect these areas could contribute to less severe side effects and better treatment outcomes (Bymaster et al., 2002).

Conclusion

In conclusion, because the etiology of ADHD is not fully understood, it is difficult for psychiatrists to initially prescribe the correct medication and dosage (Hunt and Marshall, 2012; Stockl et al., 2003). Many studies have concluded that medication is most effective in minimizing symptoms of ADHD even when compared to behavioral therapy and/or cognitive training (Sibley et al., 2014). However, a meta-analysis found that the primary reasons for discontinued use of psychopharmaceutical treatment in children were adverse side effects, ineffective treatments and poor adherence

(Sikirica et al., 2014). Efforts to resist the adverse side effects of ADHD stimulant and non-stimulant medications could be implemented by utilizing combinations of psychotherapy and a lower dosage of medication (Sibley et al., 2014). Future research should delineate the causes of side effects in order to minimize them.

Currently, the first line of treatment for ADHD are stimulants due to large effect sizes found in ADHD stimulant medication research; however, numerous studies have shown several advantages to non-stimulant use. These benefits range from fewer side effects to lower rates of drug abuse, all while maintaining the same efficacy (Garnock-Jones and Keating, 2009; Lakhan and Kirchgessner, 2012; Winhusen et al., 2011). Considering the possible irreversible effects of stimulants, such as stunted growth, the use of stimulants as the first line of treatment of ADHD in children should be re-evaluated or replaced by non-stimulant medication (Poulton and Cowell, 2003; Swanson et al., 2007). It is important to treat ADHD because of its negative impacts on social and family relationships, academic productivity, and economic outcomes. In doing so, mental health practitioners can help maintain or improve the quality of life for patients (Sikirica et al., 2014).

Non-stimulants are relatively new drugs used to treat ADHD, and research on long-term effects are comparatively less abundant than stimulant drugs. However, future studies could investigate the practicality of implementing non-stimulant drugs as the first line of treatment for the inattentive subtype of ADHD, since symptoms manifestations are less disruptive. By using a medication that has fewer negative side effects, the rate of medication discontinuance in children and adolescents could decrease, and patients' levels of normal functioning in the long-term could improve due to drug adherence (Steele et al., 2006).

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Morality by Proxy: Moral Judgment of a Close Other and the Self

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Morality determines collective ideals of right and wrong and reflects judgment of standards of culpability. Our judgments of others' morality and our own are influenced by each other: our judgments of others' morality are based at least in part on moral standards encompassed by the self, and the moral judgments we make about other people become internalized as they are considered evidence of our own morality. Interpersonal closeness can affect the perception of a moral action, and consequently individual behavior and appraisal of a close other's morality. Expanding on previous literature, we investigated whether people's judgment of their own morality was affected by condoning the action of their significant other. Participants were assigned to three conditions where they were asked to condone, not condone, or express shame over a hypothetical immoral action of their significant other, and then asked to rate self-morality, the ethicality of the action, and image threat. Although there was no difference in ratings of one's own morality, the ethicality of the action, or image threat based on condition, participants tended to feel less close to their significant other after imaging the hypothetical immoral action, and women showed a greater reduction in closeness to their significant other relative to men.

Keywords: moral judgment, self-morality, closeness, shame, morality, image threat

Acknowledgements: The authors thank their friends and family who provided feedback on an initial draft of the vignette used in the experiment, and Arcadia University for supporting this research.

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Our sense of morality, or our perception of what is right and wrong, is instrumental in shaping the way we perceive ourselves, other people and the world at large, and how the two influence each other. Morality serves a twofold function: forming the person's distinct sense of identity and maintaining social order (Ellemers & van den Bos, 2012). For the individual, taking a position on the ethicality of

an action becomes internalized as a core part of the self. For the community, establishing and distinguishing between collective concepts of "right" and "wrong" encourages a systematic process of culpability and condemnation (Ellemers & van den Bos, 2012).

A crucial part of understanding how individuals develop a sense of identity based on morality is

to explore the relationship between the moral judgment of the self and that of others. Given that our moral values guide the moral judgments we make of other people, our judgments of others' morality can become a reflection of ourselves. In simple terms, the objective of this research was to establish if our own moral identity is shaped by moral judgments, including condemnation, we make of a significant others' actions.

Factors Affecting Moral Judgments

Interpersonal closeness is a crucial factor in making moral judgments. Judgments of the morality of an action are influenced by both the interpersonal closeness to the victim, and closeness to the perpetrator, in addition to affective states elicited by the actions of a particular person. With regard to the former, when a third person harms someone we feel intimately close to, that harmful action seems worse and less moral than if it were done to a stranger (Hughes, LeChelle Creech, & Strosser, 2016). In fact, we often find it difficult to forgive those who have harmed a close other (Cheung & Olson, 2013). People tend to be more forgiving when they themselves were personally harmed, compared to when a close other was harmed. However, this difference in forgiveness seems to take place when the transgression was a distant past event rather than a recent one (Cheung & Olson, 2013).

Secondly, our moral judgment of an action is also affected when we feel intimately close to the perpetrator. Individuals are more likely to condone immoral actions committed by someone they feel intimately close to, rather than by a stranger (Forbes, 2018; Gino & Galinsky, 2012). Feelings of closeness to the perpetrator also influence the moral judgment and behavior of the self. When participants were primed to feel close or distant to an individual who behaved selfishly or unethically, they deemed the behavior to be less unethical and were likely to vicariously behave more selfishly and less ethically (Gino & Galinsky, 2012).

Another factor affecting perceptions of the morality of an action are affective states elicited by the reaction. This is reflected in not only how moral the act is perceived to be, but also how closely an individual can identify with the actor. Eliciting a feeling of being moved was found to influence appraisals of closeness to the actor and morality of the action, based on research conducted on the distinction between positive tears (or the feeling of being moved) and negative tears (Seibt, Zickfeld & Fiske, 2017). If affective states can change feelings of closeness with the moral actor, then it is reasonable to expect that perceptions of the self will also change to the extent that the self is connected to the moral actor.

Impact of Moral Judgment on the Self

Judgment of the morality of a loved one is often viewed as a reflection of the morality of the self. Consequently, it is possible that when individuals condone the immoral actions of their loved one, they have to face the internal repercussions of dissonance that arise from being inconsistent with their moral self. This dissonance translates into self-evaluations that are characterized by often stronger and more self-conscious emotions like shame, reduced feelings of closeness, and a reduced sense of morality (Forbes, 2018). Past research has documented that individuals are more likely to experience aversive emotions such as guilt and shame when they feel connected to the person engaging in immoral behaviors (Leary, 2007). Vicarious shame and guilt are similar, but they are separate processes that stem from a close other's level of shared identity or perceived interdependence (Lickel, Schmader, Curtis, Scarnier, & Ames, 2005). Shame is a critical emotion because it arises when individuals feel that there is an inconsistency with their global character. It is associated with feelings of worthlessness and introspection, heightening negative perceptions of their morality while decreasing closeness to their loved one relative to the moral judgment of a stranger (Leary,

2007). Self-evaluation in the form of shame, a decreased sense of morality, and decreased feelings of closeness are crucial parts of the moral judgment of the self. Moral condemnation of a close other could be a reflection of the morality of the self, and potentially affect the person's judgments of themselves. The shame felt on behalf of one's close other could evoke dissonance, and in an attempt to eliminate any dissonance, the person may resort to reducing feelings of closeness to that other.

Current Research

Previous research has investigated how our opinions of the morality of loved ones are shaped and influenced by their actions, and how that makes us reflect on our relationship with them. However, the way this makes us feel about our own sense of morality has not been established. The present study aims to investigate whether people's judgment of their own morality changes when they imagine condoning an unethical action committed by someone they feel intimately close with—in this case, a significant other—because individuals see their partners as an extension of themselves, or have a shared identity (Aron, Aron & Smollan, 1992).

We hypothesize that if individuals either (1) condone the behavior of their significant other, who they see as an extension of themselves, or (2) are asked to consider how the significant other's actions make them feel personally ashamed, then the individual will internalize the transgression as if they were the individual who committed immoral acts. Internalization in the condone condition should occur because participants are personally adopting the position that their close other's immoral acts were justified, whereas in the shame condition, it should occur because the emotion of shame represents an evaluation of the self. Consequently, condoning the immoral actions of a close other should pose a threat to self-image, decrease the perceived morality of the self, and cause the action to be seen as less bad. We

further predict that feeling ashamed about the close other's actions will also threaten self-image and decrease perceived morality of the self, while also decreasing closeness to their significant other (Strohlinger, Knobe, & Newman, 2017; Gino & Galinsky, 2012; Leary, 2007; Seibt et al., 2017).

Method

Participants

The participants were 164 people recruited on Amazon.com's Mechanical Turk (MTurk) and compensated \$0.30 for their participation. Six participants were excluded from analysis for failing an attention check, which was an item that said: "Please skip this question" (embedded in the self-morality scale). Another 26 participants were excluded from data analysis because they did not follow instructions within their essays. Three raters read and coded the essays and indicated which participants followed the instructions. If at least 2 raters agreed that the participant did not follow instructions, their data were excluded. Since the current study investigated participants' morality in connection with the actions of their significant other specifically, participants who did not have a significant other were excluded. The final sample consisted of 132 participants (61 males, 70 females, 1 other). The sample size was decided in advance and no analyses were conducted until data collection was completed.

Measures

Closeness. We measured the participants' level of closeness to their significant other, or how much they consider their significant other to be a part of themselves on a 7-point scale (*not at all* to *extremely*) (Aron et al., 1992). Participants were shown 7 images of two overlapping circles with the self and the other and were asked to rate which one of them best represented their relationship with their partner.

Morality of the Self. We administered a 3-item questionnaire to measure one's beliefs about their own morality (Hughes, 2016). Participants were asked to rate the extent to which they (personally) thought they were morally good, kind, and had good moral standards. Ratings were made on a 7-point scale ranging from 1 (*not at all*) to 7 (*extremely*). The questionnaire was adapted from Hughes (2016) to test how people judge themselves on their morality ($\alpha = .91$).

Ethicality of Action. Ethicality of action was derived from Gino and Galinsky's (2012) measure of how shameful a target's behavior was. Participants were asked to rate how wrong, inappropriate, and unethical they found their significant other's behaviors to be ($\alpha = .90$). Three questions in total were asked of the participants and the ratings were made on a 7-point scale (*not at all* to *extremely*).

Image Threat. We wanted to measure the extent to which their significant others' actions were perceived as a threat to their own self. In order to measure that, a three-item questionnaire on image threat was administered to (Lickel et al., 2005). Participants were asked to respond to the following questions, "*I felt that the event reflected poorly on me,*" "*I felt that people would make judgments about the type of person I am based on the event,*" and "*I was afraid that this person's behavior would be viewed as indicating something about the person I am*" ($\alpha = .82$ for family, $\alpha = .81$ for a friend). Ratings were made on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

Procedure

Participants were first presented with a screen that contained a consent statement in which participants were asked to agree to before continuing with a Qualtrics survey. After participants agreed, they were guided to demographic questions about age, gender, length of their current relationship, and how

much they consider their significant other to be a part of themselves on a 7-point scale (*not at all* to *extremely*; Aron et al., 1992). Participants were then given the following instructions: "*This study will ask you to imagine a hypothetical scenario involving **your significant other**. Please write this person's **first name or nickname** into the box below so we can integrate it into the story. _____.*" We adapted a scenario from Forbes' (2018) paper on moral processes in intimate bonds in which the participant's significant other committed an immoral act against one of their coworkers, as stated below:

Imagine at ___'s job (he) really hates (his) coworker Josh. ___ finds Josh really annoying. Even though Josh has never actually done anything mean or harmful, ___ dreads going to work because of Josh. One day ___ decides to start a false rumor that Josh is cheating on his wife and spreads this rumor to others in the workplace. Soon everyone thinks the rumor is true. Josh doesn't know about the rumor, but he is shunned by your other coworkers. Your boss, who also believes the rumor, cuts Josh's hours from 30 a week to 20.

Following the vignette, participants were given one of three short answer questions (approximately 2 sentences) based on the participants being randomly assigned to a condition: condone, not-condone, or shame. Participants in the condone condition were asked to explain why their significant other's actions were justifiable. Those in the not-condone condition were instructed to explain why their significant other's actions were wrong. Finally, participants in the shame condition were asked to explain why their significant other's actions were wrong, why they (the participants themselves) would feel ashamed of what their significant other did, as well as how their significant others' action reflected on them. The purpose of assigning the

participant to one of the three questions was to prime a certain feeling or thought process in order to influence ratings on dependent measures. Participants were then presented with the dependent measures of gauging morality of the self, ethicality of action, and image threat. Finally, participants were, once again, asked to rate their relationship with their romantic partners on a 7-point scale, concluding the survey.

Results

Main Findings

We hypothesized that participants in the condone and shame condition would rate themselves as less moral than those in the don't condone condition, but there was no significant effect of condition on ratings of one's own morality, $F(2, 129) = 1.76, p = .176$. However, we proceeded with planned contrasts to test our hypotheses. First, the condone and don't condone conditions did not differ, $t(129) = 1.09, p = .277$. However, shame and don't condone were marginally different, $t(129) = 1.83, p = .07$, although in the opposite direction of what we predicted: shame produced higher ratings of one's own morality ($M = 6.04, SD = 0.78$) than don't condone ($M = 5.66, SD = 1.02$).

Although the condition did not have an overall effect on ratings of one's own morality, we performed planned contrasts to test our hypotheses. Contrary to our prediction, writing about why one would condone the significant other's actions did not produce different ratings of one's own morality ($M = 5.88, SD = 1.06$) relative to writing about why one wouldn't condone the actions ($M = 5.66, SD = 1.02$), $t(129) = 1.09, p = .277$. Also, contrary to our prediction, writing about why one feels personally ashamed about the significant other's actions increased one's own sense of being moral ($M = 6.04, SD = 0.78$) compared to writing about not condoning those actions ($M = 5.66, SD = 1.02$), $t(129) = 1.83, p = .070$.

We predicted that participants in the condone and

shame conditions would view their significant other's action as less ethical than those in the don't condone condition. Once again, the condition participants were assigned to did not significantly affect how ethical the participants perceived their significant other's action to be, $F(2, 129) = 1.10, p = .337$. An LSD post hoc test revealed that none of the conditions were significantly different from each other: condone and don't condone ratings did not differ ($p = .824$), condone and shame ratings did not differ ($p = .177$), and don't condone and shame ratings did not differ either ($p = .209$).

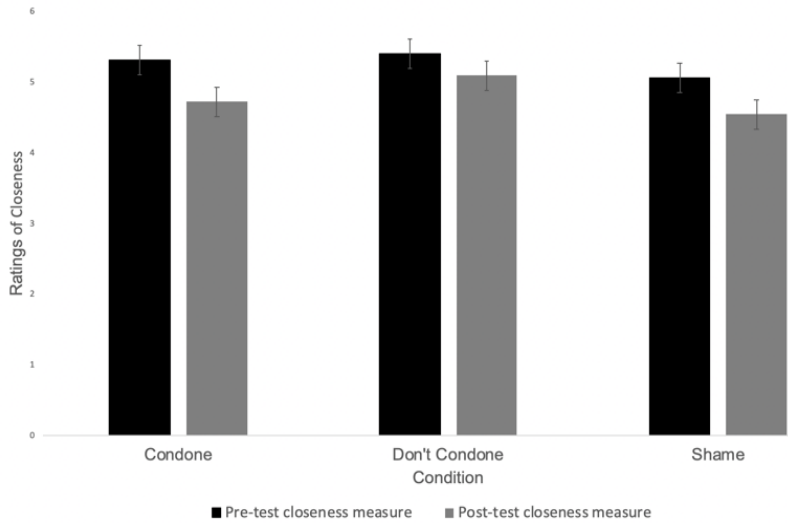
We predicted that the participants in the condone and shame condition—the latter in particular—would feel a larger threat to their image than those in the don't condone condition. The condition participants were assigned to did not significantly affect the amount of threat they felt to their own image, $F(2, 129) = .182, p = .834$. An LSD post hoc test revealed that none of the conditions were significantly different from each other: condone and don't condone ratings did not differ ($p = .753$), condone and shame ratings did not differ ($p = .547$), and don't condone and shame ratings did not differ either ($p = .726$).

Finally, we predicted that participants in the shame condition would display a greater change in feelings of closeness to their significant other than those in the don't condone condition. A 3 (condition) x 2 (time) Mixed-ANOVA—with the first factor as a between-subjects variable and the second, a within-subjects variable—revealed that there was a significant change in ratings of closeness to their significant other from the beginning of the study $F(1, 129) = 16.37, p < .001$. The main effect of condition $F(2, 129) = 0.92, p = .400$, and the interaction, $F(2, 129) = 0.60, p = .553$, were not significant. The simple effect of time (pre vs. post) on perceived closeness to their significant other was significant in both the condone ($F(1, 129) = 7.93, p = .006$) and shame conditions ($F(1, 129) = 5.41, p = .022$), and marginally significant in

the don't condone condition ($F(1, 129) = 3.27, p = .073$). Participants in all three conditions felt less close to their significant other at the end of the study (Condone: $M = 4.72, SD = 1.92$; Shame: $M = 4.54, SD = 1.70$; Don't condone: $M = 5.09, SD = 1.83$), as compared to at the beginning of the study (Condone: $M = 5.31, SD = 1.56$; Shame: $M = 5.06, SD = 1.53$; Don't condone: $M = 5.4, SD = 1.48$; see Figure 1).

Figure 2

Ratings of Closeness Before and After Manipulation



Note. Mean scores of ratings of perceived closeness to significant others before and after study, by condition.

Exploratory Analyses

Number of reasons provided.

In order to test the strength of our manipulation, we examined whether the number of reasons provided to condone, not condone, or express shame was affected by the condition participants were assigned to. Three raters independently counted the number of reasons that they identified for each participant, and an average of the three ratings was used in a one-way ANOVA. We found that the condition participants were assigned to did not significantly affect the number of reasons given for a particular response, $F(2, 129) = 2.22, p = .113$, and participants did not disclose many reasons for either the condone ($M = 1.81, SD = .59$), don't

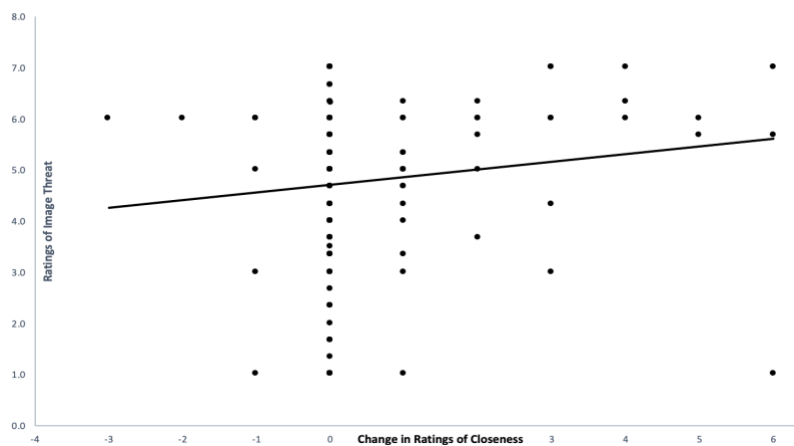
condone ($M = 1.97, SD = .66$) or shame ($M = 1.67, SD = .82$) condition. This is consistent with the lack of significant effect of condition on image threat, morality of the self, or ethicality of their significant other's actions.

Change in closeness.

The notable decrease in closeness to one's partner across all three conditions led us to question which factors contributed to this decrease, so we conducted an exploratory multiple regression on change in closeness (Time 1 minus Time 2) with condition (dummy coded) in Step 1, image threat in Step 2, and their interaction. Higher image threat predicted reduced closeness at the end of the study, $\beta = .20, F(2, 128) = 5.36, R^2 = .05$, but neither condition ($F(2, 129) = .60, p = .553, R^2\Delta = .009$) nor the interaction ($F(2, 126) = 1.66, p = .195, R^2\Delta = .073$) were significant (see Figure 2). Therefore, the more participants thought their significant other's action reflected on themselves, the less they felt that their significant other was part of themselves, although image threat only explained 5% of the variation in final ratings of closeness to their significant other.

Figure 3

Perceived Closeness and Ratings of Image Threat



Note. A scatterplot of ratings of image threat being predicted by change in closeness to significant other. The best fit line represents the direction and strength of prediction of image threat ratings.

In a second multiple regression, we regressed morality of the self onto condition (Step 1), baseline ratings of closeness (Step 2), and their interaction (Step 3). Condition did not significantly predict ratings of morality of the self ($F(2, 129) = 1.76, p = .176, R^2\Delta = .03$), nor did the interaction ($F(2, 126) = .24, p = .788, R^2\Delta < .01$). However, ratings of self-morality were significantly predicted by baseline ratings of closeness, $F(1, 128) = 3.90, p = .05, R^2\Delta = .03, \beta = .17$. Therefore, the closer participants initially thought their self was to their significant other's self, the more moral they rated themselves. However, baseline or initial ratings of closeness only explained 3% of the variation in how moral they perceived themselves to be.

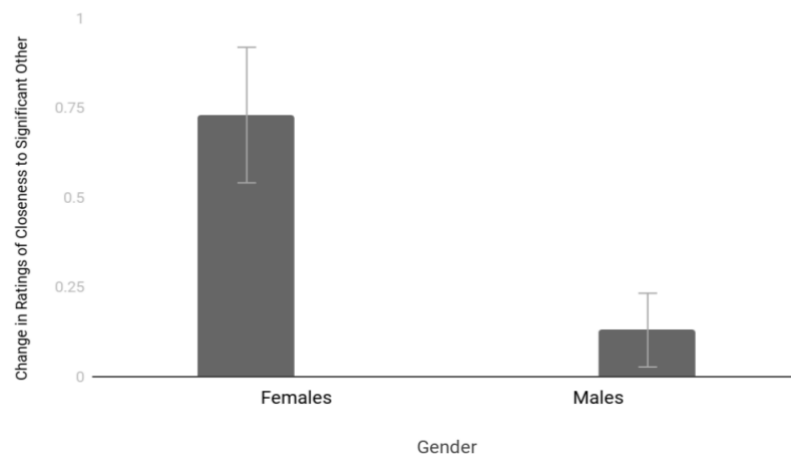
Participant gender.

We explored the degree to which participants' gender explained meaningful variance in their responses to each possible dependent measure: ethicality of the significant other's actions, self-morality, image threat, and change in the level of closeness. For each of these 3 (Condition) \times 2 (Gender) ANOVAs, there was never a main effect of condition ($ps > .190$), but in each case, there was a notable main effect of gender. Regarding the ethicality of significant others' actions, $F(1, 125) = 4.93, p = .028$, women perceived their significant others' actions as more unethical ($M = 6.51, SD = 1.46$) than men ($M = 5.72, SD = 2.10$). For ratings of self-morality, $F(1, 125) = 2.81, p = .096$, women were marginally less critical of their own morality and therefore perceived themselves as more moral ($M = 5.95, SD = 1.09$) as compared to men ($M = 5.66, SD = .83$), and women varied in their ratings of morality of the self more ($SD = 2.09$) as compared to men ($SD = 1.46$). For ratings of image threat, there was a marginally significant interaction between gender and condition on the extent of participants' perceived image threat, $F(2, 125) = 2.60, p = .078$, meaning that the extent to which gender affected amount to which participants thought their significant others' actions reflected on themselves depended on the condition they were assigned to. In the condone

and shame condition, women felt that their significant others' actions reflected on them more (Condone: $M = 5.43, SD = 1.20$; Shame: $M = 4.88, SD = 1.86$) than men (Condone: $M = 4.47, SD = 1.33$; Shame: $M = 4.82, SD = 1.75$), while in the don't condone condition, men felt their significant others' actions reflected on them more ($M = 5.16, SD = 1.10$) as compared to women ($M = 4.70, SD = 1.70$). Finally, for change in level of closeness, $F(1, 125) = 8.12, p = .005$, meaning that across all three conditions, there was a greater change in women's perceived level of closeness to their significant others' selves ($M = .73, SD = 1.58$) as compared to men ($M = .13, SD = .806$; see Figure 3).

Figure 4

Gender and Change in Ratings of Closeness



Note. Mean change in rating of closeness to significant others based on gender.

Discussion

The present study investigated whether people's judgment of their own morality changed when they imagined condoning an unethical action committed by their significant other. It was hypothesized that asking participants to condone a hypothetical immoral action by their significant other would pose a threat to self-image, decrease perceived morality of the self, and cause the action to be seen as more ethical. It was also hypothesized that feeling ashamed about the close other's actions would threaten

self-image and decrease perceived morality of the self, in addition to decreasing closeness to their significant other, as compared to participants asked not to condone their significant other's actions.

The data gathered did not support our predictions. Although the consistent null effect of condition suggests that we were unable to induce a true mindset of condoning or feeling ashamed, the significant change in level of closeness with the significant other does indicate that merely imagining that person doing something immoral left an impact on participants. In fact, the volatility of the variable of closeness to one's significant other serves as a different, though unintended, form of support for the claim that the self changes in response to a partner's (hypothetical) immoral actions. In other words, the relationship between self-morality and image threat as predicted by closeness implies a possibly distal connection with the derivation of self-morality from the self's judgments of others' morality.

As a significant predictor of moral judgment of others and the self, interpersonal closeness is well supported by past research and can affect the degree to which others' actions are perceived as moral, as well as the way we react to the actions of a close other (Gino & Galinsky, 2012; Seibt et al., 2017). This might also be reflected in the way we perceive our own moral traits. The self-concept is partly formed by relationships with others and including aspects of a close other in the self causes expansion of the self-concept (Aron et al., 2004). Therefore, the action of a close other may be perceived as a reflection of our own morality, by proxy. As a result, the significant predictions of ratings of how morally participants perceived themselves to be, and how much they thought their significant other's action reflected on themselves by baseline ratings of closeness to their significant other, is an extension of the superimposition of our significant other's self upon our own.

The concept of the inclusion of the close other in

and as a reflection of the self also extends in the other direction: closeness can be affected by the actions of a close other and mediates the extent to which we attempt to separate our self-concept from that of a close other. Since the actions of a close other (as a manifestation of their self-concept) are intimately tied to our own self-concept and can be extended to our sense of morality, we may also feel more or less close to them based on how moral we perceive their self-concept to be. If they do something that we regard as adequately immoral, in order to preserve our sense of self-morality, we may feel less close to them by distancing ourselves from them or attempting to exclude aspects of their self-concept that we incorporated into ours. In this regard, perceived closeness was significantly predicted by the extent to which participants felt that their significant other's action reflected on themselves. The general decrease in closeness can be attributed to the fact that their significant other's action—despite being hypothetical—was unambiguously and objectively perceived to be immoral, and regardless of whether they were instructed to condone, not condone, or feel ashamed of their significant other's actions; merely imagining their significant other acting immorally may have led them to realize that there *could* come a time in which their partner will behave in a reprehensible way. As such, they may have preemptively distanced themselves from their partner to protect their own sense of morality, which is reflected in the marginally significant effect of condition on the rating of self-morality.

A second unexpected but notable finding was that participants assigned to the shame condition perceived themselves to be more moral ($M = 6.04$) than those who did not condone their significant other's actions ($M = 5.66$). An expression of shame is an emotional recognition of the immorality of an action, which provides evidence that the perceiver is a moral person, and participants may be more likely to distance themselves from their significant other to bolster their sense of morality. This is also consistent

with our findings of significantly decreased closeness in the shame condition. The variation in the decrease of closeness is appropriately reflected by the fact that participants in the condone and shame condition felt significantly less close to their significant other, and those in the don't condone condition only felt marginally less close to their significant other. The dissonance experienced from inconsistency with the self's moral compass is greater in the condone and shame condition, and self-evaluations are more critical and reflect more self-conscious emotions (Forbes, 2018).

Another significant predictor of closeness was gender. Women tended to display a larger change in ratings of closeness to their significant other, in comparison to men. Akin to results of an overall decrease in ratings of closeness, this may be linked to the moral judgment of the self by proxy of moral judgment of a significant other by variables such as ratings of self-morality and image threat felt. Women tend to be more prone to guilt and shame when recalling past transgressions done for personal gain, consequently displaying harsher moral condemnation (Ward & King, 2018). Women's greater empathic concern and proneness to shame and guilt lead them to prioritize morality more than men (Benetti-McQuoid & Bursik, 2005; Cohen, Wolf, Panter & Insko, 2011; Else-Quest, Higgins, Allison & Morton, 2012). Socialization that prioritizes warmth, empathy and the assignment of roles associated with caregiving could make women consider kindness. Since they would experience more negative emotions in response to immoral actions integral to their self-esteem, they might report being more prone to guilt and shame (Benetti-McQuoid & Bursik, 2005; Josephs, Markus, & Tafarodi, 1992).

In the present study, there was a trend for women to rate their significant others' actions as significantly more unethical ($M = 6.51$) than men ($M = 5.72$), and for women in the condone and shame condition to experience marginally more image threat (Condone: $M = 5.43$; Shame: $M =$

4.88) as compared to men (Condone: $M = 4.47$; Shame: $M = 4.82$), which is consistent with past research. Women who tend to be more critical of the ethicality of their significant other's actions may tend to think they are more moral, and therefore experience a greater threat to their self-esteem if they condoned or experienced shame over their significant other's immoral action, as compared to men who are not as critical of their significant others' actions. A heightened link between moral judgment, guilt, and self-esteem (or image threat) helps explain the observed greater change in closeness among women as compared to men. If women are more critical of their significant others' actions and experience a greater threat to their self-esteem when condoning their significant others' immoral actions--or experiencing guilt over the same--they may display more change in ratings of closeness to their significant other. They might then also distance themselves from their significant other more so as to reduce feelings of dissonance and external judgment.

Although the current study suggests a novel connection between condoning an immoral action of a close other, and closeness to the same person, it is not without limitations. One of the main reasons why there was no direct effect of condition assigned on ratings of self-morality, the ethicality of the action, image threat or change in closeness may be that our manipulation of the scenario was too weak, in that participants were not able to adequately visualize their significant other's hypothetical immoral action. The lack of a significant number of reasons provided to justify condoning or expressing shame over their significant other's hypothetical immoral actions indicates that participants may not have been able to completely immerse themselves into the state of condoning or feeling ashamed over the hypothetical immoral action of their significant other. It remains possible that if they truly found themselves condoning a significant other's immoral action in their own true lives, it might change how they morally rated themselves.

Therefore, failure of the manipulation means the study might have been an insufficient test of our hypothesis.

Future Research

The significant change in closeness observed in the context of a romantic relationship opens up the possibility of a similar effect in other types of relationships, such as familial relationships or friendships. Unlike romantic relationships or friendships, association with the family unit is fixed and parental morality and family processes play an instrumental role in moral development (White & Matawie, 2004). Therefore, a follow-up study investigating whether a hypothetical immoral action by a family member would affect how ethical the participant perceived the action to be, how close they felt to their family member, and how a change in closeness affects the behavior of the participant, would shed light on the distinctive nature of familial relationships. A study on the morality of a family member and closeness could also be explored in a cross-cultural context, wherein ratings of ethicality of their family member's actions and closeness to their family member could be compared between participants from eastern and western cultures. Based on Confucian values, Taiwanese participants tended to perceive a stranger's illegal behavior as more unethical than that of a family member and would probably show more consistency in morality and closeness ratings—even when their family member does something immoral—as compared to western participants (Hwang, 2006).

Another factor that might affect ratings of closeness is the length of the participant's relationship with their significant other. Future research could also investigate the role this has on ratings of closeness and if it is a significant predictor of the amount of change in closeness when participants perceive their significant other differently.

Conclusion

The variability of perceived closeness to a

significant other in response to hypothetical immoral actions implies the volatility of not only an individual's sense of morality, but also conceptualization of the self-concept in relation to others. While past research has already established that closeness is instrumental in determining moral judgment, this research reveals that the mere thought of one's significant other acting immorally can affect how close we feel to them.

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Subjective Well-being, Personality, and Emotion Regulation: A Multivariable Analysis

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Few studies have investigated the direct relationship between subjective well-being (SWB), extraversion, and cognitive reappraisal. Here, we simultaneously investigated (i) whether there is a positive correlation between extraversion and SWB, (ii) whether this relationship can be explained by cognitive reappraisal, and (iii) whether cognitive reappraisal moderates the relationship between extraversion and SWB. The study used self-report data from 87 participants ($n = 87$) who completed an online survey to assess their level of subjective well-being, extraversion, and the use of cognitive reappraisal. The results revealed that there is a significant positive correlation between cognitive reappraisal and SWB. This finding has important implications for the fields of parenting and education in terms of the promotion of adaptive emotion regulation strategies in youth. The results also suggested that the relationship between extraversion and SWB is not related to cognitive reappraisal. This raises interesting questions about the nature of interactions between emotion regulation, personality, and SWB that merits further research.

Keywords: Subjective well-being, Extraversion, Cognitive reappraisal

Acknowledgements: This work was part of a final project by the author for the undergraduate course *Psychology 101: Research and Data Analysis in Psychology*. The author would like to thank Dr. Arman Catterson, the instructor of the course, and Joseph Ocampo, the graduate student instructor, for their valuable guidance and feedback on this research work. This research project received no external sources of funding. Correspondence concerning this article should be addressed to Janan Mostajabi, Department of Psychology, University of California, Berkeley, Berkeley, CA 94720.

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Subjective well-being (SWB), a measure of satisfaction with life, is an incredibly important factor of human life. An individual's subjective well-being is a core predictor of their satisfaction with life and whether they find their life meaningful (Diener et al., 2003). SWB is defined as "an individual's cognitive and affective evaluations of his or her life", which consists of three main components: life

satisfaction, positive affect, and negative affect (Diener et al., 2003; Diener et al., 1985). Positive affect describes emotional states such as joy and optimism, and negative affect describes states like sadness and anger (Proctor, 2014). Generally, other aspects of life such as social relationships, career goals, wealth aspirations, physical and psychological health goals, and the like, are means to improve our subjective well-being. This suggests that SWB plays a fundamental role in

human experience. Furthermore, on a societal level, subjective well-being is beginning to be seen as a better indicator of a country's success and development than gross domestic product (GDP), which has been shown to be inaccurate (Layard, 2012).

Given that personality traits can, to a large extent, influence how people think and behave, it is not surprising that an individual's personality also plays a role in their subjective well-being (Lopez et al., 2009). According to previous research, one personality dimension that significantly influences SWB is extraversion, which is defined as "representing the quantity and intensity of interpersonal interactions, the need for stimulation and the capacity for joy" (Piedmont, 1998). A study by Grant et al. (2009) found a positive correlation between extraversion and SWB, concluding that this personality dimension represents a predisposition for general well-being. Additionally, Li et al. (2015) found that individuals high in extraversion have higher reports of SWB, and that self-esteem mediates this correlation.

Past research in the field of emotion suggests a correlation between emotion regulation and SWB (Balzarotti et al., 2016). Emotion regulation strategies refer to the cognitive processes involved in "influencing which emotions we have, when we have them, and how these emotions are experienced and expressed" (Gross, 1998). There are two main categories of emotion regulation strategies: adaptive and maladaptive. Adaptive emotion regulation strategies are defined as strategies that are "associated with beneficial long-term outcomes". Maladaptive strategies are defined as strategies that are "associated with negative long-term outcomes" (Schäfer et al., 2017). An example of an adaptive emotion regulation strategy is cognitive reappraisal, which refers to "changing the way one thinks about potentially emotion-eliciting events" (Cutuli, 2014) in order to respond more positively. An example of a maladaptive strategy is expressive suppression, defined as "the attempt

to hide, inhibit, or reduce ongoing emotion-expressive behavior" (Cutuli, 2014). Another study found that adaptive emotion regulation strategies, including cognitive reappraisal, are positively associated with subjective well-being, while maladaptive emotion regulation strategies are negatively associated with well-being (Balzarotti et al., 2016).

One major limitation of past research studies is that they have exclusively investigated either the relationship between extraversion and subjective well-being or between emotion regulation strategies and subjective well-being. Previous studies have not directly studied the simultaneous relationship between the three factors—SWB, extraversion, and emotion regulation strategies. A concurrent examination of the three factors, however, is especially important since past research has indicated that extraversion may be associated with better modulation of emotional responses and increased use of social support (Kokkonen & Pulkkinen, 2001). Additionally, this implies that adaptive emotion regulation strategies, such as cognitive reappraisal, may be associated with certain personality traits, and that this association can consequently play a role in the individual's subjective well-being. To address this limitation of past research, this paper aims to investigate the relationship between SWB and extraversion, and to explore how cognitive reappraisal, an adaptive emotion regulation strategy, moderates this relationship. Thus, studying the relationship between SWB, extraversion, and cognitive reappraisal simultaneously can lead to important insights on individual and societal life satisfaction.

This study first tests the hypothesis that there is a positive correlation between SWB and extraversion. Second, the study examines the hypothesis that cognitive reappraisal does not entirely explain the relationship between SWB and extraversion. Finally, the study investigates the hypothesis that cognitive reappraisal moderates the relationship between SWB and

extraversion, such that the use of cognitive reappraisal would strengthen the positive relationship between SWB and extraversion.

Methods

Participants

For this study, a convenience sample was used, which included 87 participants ($N = 87$), with an average age of 20.8 years, ranging from 12 to 57 years old ($SD = 6.14$, range = 45). 19.5% of the participants identified as male ($N = 17$), 80.5% identified as female ($N = 70$), and no participant identified as non-binary. 55.2% of participants spoke English as their native language ($N = 48$), while 44.8% spoke English as a second language ($N = 39$). Participants were recruited by asking friends and relatives of the researcher to take the survey. In order to increase the number of participants, snowball sampling was also used by asking each individual participant to distribute the survey amongst their own friends. Additionally, the link to the survey was posted on social media (Facebook and Instagram) in order to get participants from a wider range of backgrounds. No incentive was offered for participation.

Procedure

A questionnaire with 28 questions was created in Qualtrics (Appendix A). In this study, participants first followed the link to the questionnaire, read the introduction page, and were assured that their responses would remain anonymous. Next, they completed the demographics section. Following that, they continued to the questions section, which assessed subjective well-being, extraversion, and emotion regulation strategies (cognitive reappraisal and expressive suppression). The questions on the three measures appeared in randomized order with the aim of masking what the questions were assessing and, therefore, decreasing bias. After completing all 28 questions, participants viewed a page that thanked them for their participation.

Measures

Subjective well-being (SWB)

To measure participants' subjective well-being, a self-report survey was chosen using the Satisfaction With Life Scale (SWLS) (Diener et al., 1985). The measure included 5 questions that were rated on a scale from 1 (strongly disagree) to 7 (strongly agree).

Extraversion

Extraversion was measured through self-reports using the Big-Five Factor Markers scale (Goldberg, 2001). The measure consisted of 10 items. The original rating scale ranged from 1 (disagree) to 5 (agree). However, for the sake of consistency with the scales for SWB and emotion regulation strategies, this rating scale was also converted to a 7-point scale, ranging from 1 (strongly disagree) to 7 (strongly agree).

Cognitive reappraisal

Cognitive reappraisal, an adaptive emotion regulation strategy, was assessed through self-reports using the Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003). The questionnaire consisted of 10 items, with 6 questions measuring cognitive reappraisal and 4 questions measuring expressive suppression. Since this study focuses only on adaptive emotion regulation strategies (i.e. cognitive reappraisal), the facet of expressive suppression was not included in the models and analyses. The rating scale ranged from 1 (strongly disagree) to 7 (strongly agree).

Results

Data Cleaning

Although there were 109 survey responses, 22 responses were incomplete and thus were removed directly from Qualtrics before exporting the data, resulting in a total of 87 responses.

Descriptive Statistics

The mean, standard deviation, range, and alpha reliability for the three continuous variables in this study are recorded below in Table 1.

Table 1

Descriptive Statistics of SWB, extraversion, and cognitive reappraisal.

Variable	M	SD	Range	Alpha α
Subjective Well-being (SWB)	4.54	1.18	5.00	0.81
Extraversion	4.16	1.26	5.90	0.91
Cognitive Reappraisal	4.48	1.02	4.83	0.82

Note. All three variables are continuous. A higher variable mean indicates higher intensity of the measure.

Hypothesis Testing

A series of regression models were conducted in order to test the effect of extraversion and cognitive reappraisal on subjective well-being. All three variables were standardized (z-scored) to facilitate cross-comparison.

Hypothesis 1 – The relationship between SWB and extraversion

To test hypothesis 1, a bivariate model was used to assess the effect of extraversion on subjective well-being (Figure 1). As documented in Table 2 (Model 1), extraversion ($\beta = 0.19$, 95% CI = [-0.03, 0.40], $t(83) = 1.74$, $p = 0.09$) has a weak positive relationship with subjective well-being, but the effect is insignificant as the p-value is larger than 0.05. Therefore, alternative hypothesis 1 is not supported due to the high p-value (0.09), low power (0.40), and low R^2 (0.04).

Hypothesis 2 – The relationship between SWB and extraversion with cognitive reappraisal as a mediator

To test this hypothesis, first a bivariate model for the effect of cognitive reappraisal on subjective well-being was conducted (Figure 2). As

summarized in Table 2 (Model 2), there is a weak positive correlation between subjective well-being and cognitive reappraisal ($\beta = 0.22$, 95% CI = [0.01, 0.43], $t(85) = 2.05$, $p = 0.04$), which is significant as the p-value is below the threshold of 0.05. In addition, the relationship between extraversion and cognitive reappraisal was analyzed ($\beta = 0.02$, 95% CI = [-0.19, 0.24], $t(83) = 0.22$, $p = 0.83$), and there is almost no correlation, which is also statistically insignificant.

Then, a multivariate model was used to test whether cognitive reappraisal is a potential confounding variable influencing the relationship between extraversion and SWB. As Model 3 in Table 2 shows, after controlling for cognitive reappraisal, the relationship between extraversion and SWB ($\beta = 0.16$, 95% CI = [-0.05, 0.37], $t(82) = 1.50$, $p = 0.14$) weakens slightly, but these results are statistically insignificant. Based on these findings, no definitive conclusions can be made about hypothesis 2 as the p-value is above the 0.05 threshold.

Hypothesis 3 – The relationship between SWB and extraversion with cognitive reappraisal as a moderator

The interaction effect of cognitive reappraisal was tested using a multivariate model in order to assess whether the relationship between extraversion and subjective well-being depends on the level of cognitive reappraisal (Figure 3). As documented by Model 4 in Table 2, the effect of cognitive reappraisal on the relationship between extraversion and subjective well-being is statistically insignificant ($\beta = 0.07$, 95% CI = [-0.14, 0.27], $t(81) = 0.66$, $p = 0.11$). This suggests that for the specific sample of this study, the relationship between extraversion and subjective well-being is not affected by whether or not participants use cognitive reappraisal. However, since this result is statistically insignificant, it does not necessarily reflect the real role of cognitive reappraisal in the

relationship between extraversion and subjective well-being in a real-world population.

Figure 1
Subjective Well-being and Extraversion

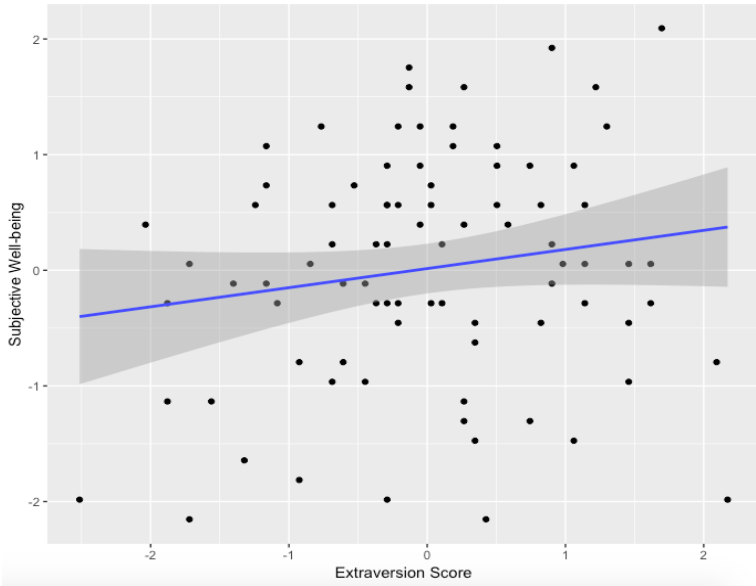


Figure 2
Subjective Well-being and Cognitive Reappraisal

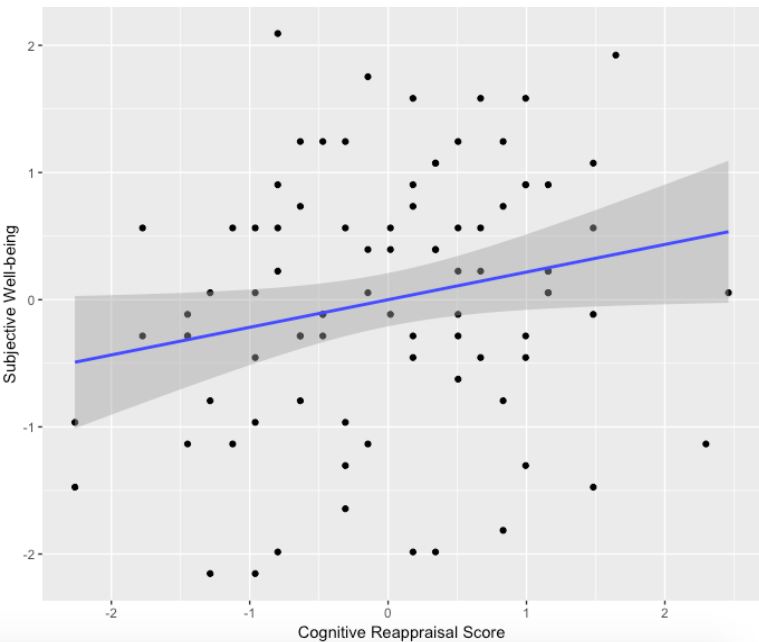
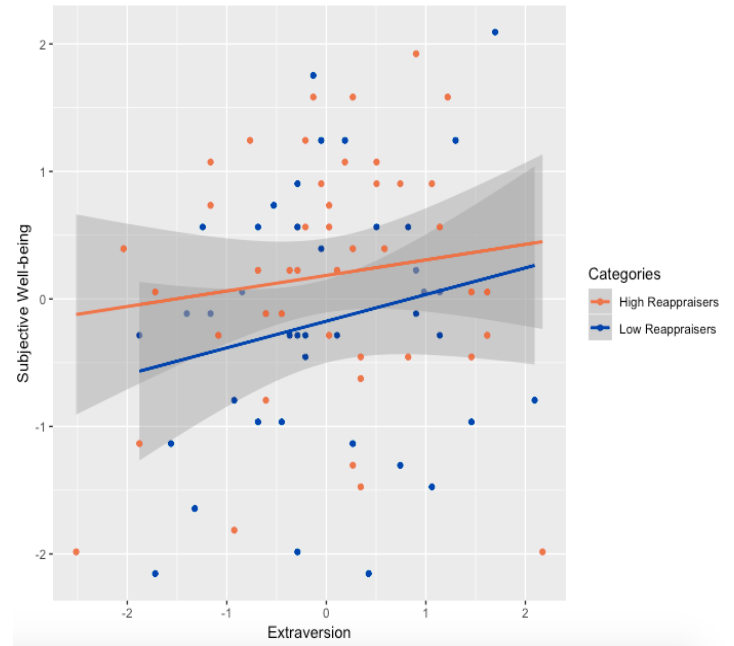


Figure 3
Subjective Well-being, Extraversion, Cognitive Reappraisal



Note. The graph represents the interaction effect of cognitive reappraisal on the relationship between extraversion and subjective well-being.

Table 2
Summary of model results

Estimated Effects	Standardized β s			
	Model 1	Model 2	Model 3	Model 4
Extraversion	0.19 [-0.03, 0.40]	–	0.16 [-0.05, 0.37]	0.16 [-0.06, 0.37]
Cognitive Reappraisal	–	0.22* [0.01, 0.42]	0.20 [-0.01, 0.41]	0.20 [-0.02, 0.41]
Extraversion* Cognitive Reappraisal	–	–	–	0.07 [-0.14, 0.27]
Model Summary				
R ²	0.04	0.05	0.04	0.04
F-Test	3.01 (1, 83)	4.21 (1, 85)	2.97 (2, 82)	2.11 (3, 81)

Note. 95% Confidence Intervals reported in brackets. Degrees of freedom for the F-test reported in parenthesis (model, residual).

*p < 0.05.

Discussion

Past research has found a strong positive relationship between extraversion and subjective well-being (Grant et al., 2009; Li et al., 2015). Our statistical analyses suggest that extraversion has a weak positive correlation with subjective well-being, but this relationship is not statistically significant. Since a strong positive correlation between extraversion and subjective well-being has been consistently reported in the literature (Lopez et al., 2009; Grant et al., 2009; Li et al., 2015), it is highly likely that the present finding is due to chance. This inconsistent finding may partly be due to the differences in situational factors within the sample, since it is the combination of both situational and personality factors that influences the extraversion–SWB correlation (Pavot et al., 1990). This may imply that extraversion is not *inherently* associated with a higher SWB, but rather that environmental factors, such as upbringing, socioeconomic status, and culture also influence that relationship. To overcome this sampling issue, the study must be replicated with a more diverse sample that is representative of the larger population.

Importantly, the results also indicate that the use of cognitive reappraisal as an adaptive emotion regulation strategy has a weak positive relationship with SWB, which is statistically significant, as supported by past research (Balzarotti et al., 2016; Cutuli, 2014). This has important implications, as individuals could actively modify and improve their emotion regulation skills by employing adaptive emotion regulation strategies, such as cognitive reappraisal, thereby potentially improving their subjective well-being. This finding also extends to children's growth in terms of how parents and teachers can influence emotion regulation in children. In fact, past research has found that children learn emotion regulation skills through observational learning, social referencing, and modeling, and that parental attitudes related to emotions influence children's emotion regulation

(Morris et al., 2007). This sheds light on the critical role of parents and teachers in instilling adaptive emotion regulation strategies in children from an early stage in life.

One major limitation of this study is that all but one of the findings were statistically insignificant, with a p-value greater than 0.05. This means that no definitive conclusions could be drawn from those results. The statistical insignificance is likely due to the biased sample of this study. Since opportunity sampling was used, most participants were college students from the same public university and the majority (78%) were in the same age-range (18-20 years). This means that the participants were likely to share many similar experiences and characteristics, which could potentially bias the results. To overcome this limitation, the study must be replicated with a randomized sample of participants from a wide variety of backgrounds to ensure more robust findings.

Another limitation is the study's gender-biased sample. With the skewed distribution of 80.5% females and only 19.5% males, the sample is not representative of the larger population. This gender bias could partly explain the inconsistency of the results of this study with previous research findings on the relationship between SWB, extraversion, and cognitive reappraisal. This limitation is especially relevant because research has shown that women are more likely than men to report the use of most emotion regulation strategies (Nolen-Hoeksema & Aldao, 2011), suggesting that gender seems to play a significant role in emotion regulation. To address this limitation, future research must investigate the relationship between SWB, extraversion, and cognitive reappraisal while controlling for gender differences and using a more representative sample.

The measures used in the study's self-report questionnaire had relatively high Cronbach's alpha values, with the Satisfaction with Life Scale ($\alpha = 0.87$), the Emotion Regulation

Questionnaire (ERQ) ($\alpha = 0.89$), and the Big-Five Factor Markers Scale ($\alpha = 0.87$), all of which have been shown to have high reliability and internal consistency. However, though the ERQ has been validated multiple times using student samples, a study using a community sample failed to replicate the expected factor structure (Spaapen et al., 2014; Wiltink et al., 2011). This raises questions about the measure's validity and reliability for a real-life population. Furthermore, the study's self-report data may also affect the validity of the findings. While self-reported data can provide insights into individuals' internal feelings and private behaviors that are not publicly visible, participants may respond dishonestly due to a social desirability bias, or inaccurately due to a lack of self-knowledge. Additionally, the questionnaire format does not collect in-depth personal responses, which would capture participants' experiences in more detail. In fact, Kostiuk and Fouts (2002) and Taylor et al. (2018) argue that a qualitative approach, as opposed to the quantitative method, may be more appropriate for the study of emotion regulation processes and their effects as it provides rich descriptive details. Therefore, it would be worthwhile to use interviews with open questions in future replications of this study to examine whether the same findings still hold.

Conclusion

Subjective well-being (SWB) is defined as an individual's cognitive and affective assessment of their life (Diener et al., 2003). SWB is significantly influenced by personality traits, such as extraversion, as well as by emotion regulation strategies (Lopez et al., 2009). Emotion regulation strategies refer to the processes involved in influencing the emotions one has and how these emotions are experienced and expressed (Gross, 1998). This study simultaneously investigated the direct relationship between extraversion, cognitive reappraisal, and subjective well-being. The findings suggest that there is a weak and non-significant positive relationship between

extraversion and subjective well-being, which contradicts past research (Lopez et al., 2009; Grant et al., 2009; Li et al., 2015). Since this result is statistically insignificant, no definitive conclusions can be drawn based on it. Yet, the results also revealed that there is a weak but statistically significant positive correlation between the use of cognitive reappraisal and subjective well-being.

Given that this study only focused on the trait of extraversion, it would be fruitful for future studies to explore how other Big Five personality traits interact with the relationship between cognitive reappraisal and well-being. Significantly, the finding on the positive correlation between the use of cognitive reappraisal and subjective well-being has important implications for the fields of parenting and education. Parents, caretakers, and educators should attempt to cultivate adaptive emotion regulation strategies, such as cognitive reappraisal, in children and students in the hope that these adaptive strategies become habitual and ingrained by adulthood (Compas et al., 2014; Liu et al., 2019). Research on emotion regulation processes in children suggests that parental modeling, parenting practices, and parental emotion-related beliefs play a crucial role in the development of emotion regulation approaches in children (Gunzenhauser et al., 2014). Therefore, it is important for future interventions to not only assist parents in the socialization of adaptive emotion regulation strategies at a behavioral level, but also to help parents and caretakers develop adaptive beliefs with regards to emotion regulation (Gunzenhauser et al., 2014). Furthermore, in light of the positive relationship between cognitive reappraisal and subjective well-being, cognitive reappraisal techniques can be incorporated in the treatment plan of patients with such mental health conditions as generalized anxiety disorder and depression to improve subjective well-being and attenuate their symptoms (Fresco et al., 2013; Kovacs et al., 2006).

Future research could use brain-imaging techniques to focus on the neural mechanisms of cognitive reappraisal as it occurs in the brain, in order to further understand how these cognitive experiences translate into neural activation in both healthy and clinical populations (Ochsner et al., 2002; Cutuli, 2014; Öner, 2018). For example, individuals with clinical anxiety and depression may be more prone to automatic negative thoughts, and, consequently, poorer well-being (Teasdale, 1985; Iancu et al., 2010). If there are certain neural markers for a diminished employment of cognitive reappraisal in these patients, neuroimaging studies could begin to identify them, and researchers could gain more insight into the neurological bases of certain mental illnesses (D'Avanzato et al., 2013; Vanderhasselt et al., 2013).

Likewise, in healthy children, the absence of activity patterns typically associated with habitual cognitive reappraisal use might predict a lower capacity for the employment of cognitive reappraisal later in life, which may be associated with lowered well-being in the long-term. Therefore, by identifying potential risks in advance, parents can seek appropriate resources for their at-risk children in order to help them develop a more adaptive emotion regulation approach earlier in life.

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Appendix

Questions adapted from:

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- Goldberg, L. R. (2001). International Personality Item Pool: A scientific collaboratory for the development of advanced measures of personality traits and other individual differences. *International Personality Item Pool*. Retrieved from <http://ipip.ori.org/>
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This is a short survey for *Psychology 101: Research and Data Analysis in Psychology*. The survey should take about 3-5 minutes to complete.

All responses are anonymous; please answer openly and honestly. Thank you!

DEMOGRAPHIC INFORMATION

What is your age in years?

What is your sex?

- Male
- Female
- Other

Is English your native language?

- Yes
- No

PERSONALITY, WELLBEING, EMOTION REGULATION

The following questions assess personality type, emotion regulation, and subjective well-being. Please read the statements below and choose a number from 1 (strongly disagree) to 7 (strongly agree) to indicate your level of agreement with each statement.

SUBJECTIVE WELL-BEING, EXTRAVERSION, AND COGNITIVE REAPPRAISAL | JANAN MOSTAJABI

	1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neither agree nor disagree	5 Somewhat agree	6 Agree	7 Strongly agree
In most ways my life is close to my ideal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have little to say.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The conditions of my life are excellent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am feeling positive emotions, I am careful not to express them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am the life of the party.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I want to feel less negative emotion, I change the way I'm thinking about the situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
So far I have gotten the important things I want in life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I could live my life over, I would change almost nothing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable around people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I start conversations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SUBJECTIVE WELL-BEING, EXTRAVERSION, AND COGNITIVE REAPPRAISAL | JANAN MOSTAJABI

I talk to a lot of different people at parties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't mind being the center of attention.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am feeling negative emotions, I make sure not to express them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't talk a lot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I control my emotions by changing the way I think about the situation I'm in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't like to draw attention to myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I keep my emotions to myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am quiet around strangers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I want to feel more positive emotion, I change the way I'm thinking about the situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Social Media Responses to Self-Concept Threats

Tess Wild & John Blanchar
Swarthmore College

Several studies demonstrate that individuals carry out observable behaviors in order to achieve positive self-concepts. These behaviors can be related to engagements with social media. Thus, two studies tested whether the sharing of self-relevant symbols on user-heavy social media platforms is an engagement used to achieve positive self-concepts. In these studies, participants viewed resumes (Study 1) or LinkedIn profiles (Study 2) intended to threaten their self-definition and then considered their own accomplishments in comparison. They were then asked to rate and choose one article, either relevant or irrelevant to their self-definition, to hypothetically share on their own social media page based on attractiveness. In Study 1, a high threat to participants' self-definition led them to report goal-irrelevant articles as less attractive to share on social media. In Study 2, the data displayed varied results for relevant and irrelevant social media sharing, depending on the stimulus type. Participants' self-definition goals moderated the effect in Study 2. Discrepancies in study findings are discussed in the context of the self-evaluation maintenance and symbolic self-completion theory.

Keywords: Social media, self, self-regulation, social comparison, self-esteem

Acknowledgements: Thank you to Swarthmore College for supporting this research.
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More than two billion people use some form of social media worldwide and more than 75% of people in the United States have a social networking profile (eMarketer, n.d.). As social media usage becomes more prevalent, it changes the way we interact with the world and each other. Instagram “memories” replace scrap books, Facebook “wall posts” replace birthday cards, and instant messages replace phone calls. Less of life is taking place face-to-face and more of it is taking place online (Twenge, 2017). Just as social media is reshaping the way we interact, it may also be altering the techniques we use to construct and manage our identities and sense of self. As society becomes increasingly reliant on it for communication, it is important to understand the ways in which social media alters our perceptions of others, as well as how

we begin to use social media to create perceptions of ourselves.

The increased use of social media and universality of social media presences has altered the expectations of self-presentation. Users are encouraged to take advantage of social media platforms by creating and communicating an identity on their profiles (boyd & Ellison, 2007). The ability for users to control and produce their own press to an audience of family and friends, makes it easy to mold public personas; and, use such personas to influence the impressions and perceptions others make and create about them. The material users choose to share can often reflect their self-concepts: ideas and beliefs they have about themselves.

This study aims to explore how, and under what conditions, individuals use their social media

profiles to communicate and affirm their self-concept while managing self-esteem. Previous research mainly identifies behaviors through face-to-face interactions, however, the present study tests whether self-definitional needs influence behavior on current social media platforms. The present study narrows in on social media engagement in order to understand these behaviors as it relates to the current rise in social media usage . More specifically, we aim to examine a phenomenon known as symbolic self-completion, within the context of social media activities. We hypothesize that when individuals experience status insecurity (i.e., a feeling of incompleteness or lacking in self-definition) as a result of encountering self-definitional threat, they will respond by displaying self-relevant symbols on their social media profile.

The Self and Social Media

Self-concept, or an individual’s understanding and beliefs of their own attributes, including who and what they are, is a central idea in past research on the self (Baumeister, 1999). The self-concept is an important factor in a person’s social identity —one derived from their knowledge of membership in a particular social group, as well as the value and emotional significance they assign to that membership (Tajfel et al., 1979). The self-concept is social in nature. It is also both a reflection and internalization of others’ reactions to the self that an individual presents in social settings, otherwise known as the public self (Turner & Onorato, 1999). Moreover, individuals strive to establish positive social identities in order to achieve positive self-concepts (Tajfel et al., 1979; Tesser & Campbell 1982; Wood 1989). Thus, individuals usually engage in self-enhancement during social interactions and source their self-esteem from successfully obtaining a positive self-image.

Social media sites, such as Facebook, Twitter, and Instagram, increase hyper-connectivity, which provide opportunities for increased self-esteem. Online profiles give users an audience to whom they can strategically display aspects of

the self. These profiles also allow for reactions to those aspects, which can clarify or challenge a user’s understanding of who they are and how they are perceived by others. In other words, individuals can assess others’ reactions to their social media posts and activities to gauge public evaluations of the self, which informs self-concept.

The notion that social media sites are stages for the self connects well with social comparison theory. According to social comparison theory, people compare their own abilities to those of others in order to form judgments about their own abilities; this generates a self-concept (Festinger, 1954). In the context of social media, comments and likes can serve as indicators of performance and feedback, and other profiles are databases of others’ abilities. These other profiles can serve as a medium for comparison. That is, when objective, physical bases for evaluations do not exist or are not available, such as judging how well-matched an individual is to their self-concept, an individual’s assessment of their abilities depends on subjective judgements that rely on comparisons with other people (Festinger 1954).

Comparing oneself to someone who is relatively superior (i.e an upward comparison) may threaten the self-concept when the discrepancy is large or if the area of comparison is of personal importance (Festinger, 1954). Importance moderates this self-definitional threat in such a way, that the more important the ability is to a person, the more likely it is that that person “will recognize and acknowledge that someone else is clearly superior to them” (Festinger, 1954, p. 131). Past research (Haferkamp & Kramer, 2011; Vogel, Rose, Roberts, & Eckles, 2014) has shown that users capitalize on the features provided by social media in order to engage in these kinds of comparisons.

The Self-Evaluation Maintenance (SEM) model (Tesser & Campbell, 1982) examines

comparison processes. The SEM also suggests that individuals choose comparison targets in an effort to manage self-esteem. The SEM predicts that when two individuals are close, one individual's superior performance will lead to a greater threat than if they were distant; and, when performance is highly self-relevant, such that it is a "self-defining" area, that individual will be motivated to compare themselves in a way that evokes threat to their self-definition (Tesser & Campbell, 1982). To maintain a positive self-evaluation, individuals can either reduce closeness (distance themselves from the other), reduce relevance (distance themselves from the goal), or reduce the performance differential (improve their own performance or do something to impair the other's performance).

Symbolic Self-Completion Through Social Media

Other work highlights that individuals achieve self-definition or positive self-concepts by using indicators of attainment, which could be any behavior or representation that conveys information about an individual's identity (e.g., an academic degree or professional title). Indicators of attainments can be used to influence others' opinions by providing self-descriptions of an individual's performances or interests to ensure that others will be exposed to those descriptions (Wicklund & Gollwitzer, 1981). Arthur (1997) also highlights the importance of this visual element in self-symbolizing—or rather, the need for others to observe and acknowledge the physical symbols that an individual displays. For instance, if an individual held the belief that they were intelligent but could not acquire the usual symbols that characterize this self-definition (e.g., advanced degrees), then they would seek alternative symbols to appear intelligent, such as buying/displaying books or demonstrating a large vocabulary (Schiffmann & Nelkenbrecher, 1994). Once others react to those descriptions as if the individual embodies that self-definition, then the individual will feel complete and validated (Arthur, 1997; Gollwitzer, Wicklund, & Hilton, 1982).

Harmon-Jones and colleagues (2008) extended their research on symbolic self-completion by studying self-symbolizing behaviors found in Internet communication. In their study, they examined email signatures and the relative status of university professors. Consistent with motives for symbolic self-completion, they found that those with fewer indicators of success (i.e., less senior in their career) were more likely to use their email signatures to communicate their success to others (i.e., had more elaborate email signatures). Beyond email, other forms of Internet communication, such as social networking sites, provide promising areas of study for symbolic self-completion because they include both the visual and auditory exchanges that are seen in face-to-face interactions. This can be applied to Facebook, for example. Facebook gives users powerful mechanisms to steer and produce public profiles which can be used as expressions of the self. These profiles can then be used to communicate information about one's self-definition and can serve as a platform to symbolize. That is, as platforms have updated their functionality, users have come to understand these online spaces as tools for self-promotion: interface technologies (e.g., "liking", "following", "friending") emote, connect, and allow for the accumulation of social capital from a curated audience (van Dijk, 2013).

The present study focuses primarily on social media profiles as sites for identity clarification, which Bazarova and Choi (2014) found to be a motivating factor for disclosing public updates via Facebook. Social media platforms allow individuals to communicate and develop their idealized selves to their curated audience, whether that be public followers or friends and family. In research on teen social media usage, boyd (2010) found that social media is used in a way that, for many, feels seamless with their everyday lives; it does not constitute an alternative or "virtual" world. Public networks also provide opportunities for "always on" access to peers, which makes creating public

identities on an individual's social network easy and accessible (boyd, 2010). This raises questions as to whether symbolic self-completion behaviors persist on social media platforms.

We hypothesize that when individuals are exposed to stimuli that threaten their self-definition, they will be more inclined to engage in symbolic behaviors—behaviors that affirm their self-concept—on social media platforms, compared to those whose self-esteem has not been threatened when exposed to stimuli.

Study 1

The goal of Study 1 was to test whether inducing feelings of high threat to an individual's self-definition would lead to higher ratings of attractiveness for self-relevant stimuli; and, if it would increase the individual's likelihood of selecting self-relevant stimuli to share on a hypothetical social media page. Self-definitional threat was manipulated by having participants compare themselves to a highly impressive or unimpressive resume from a supposed student at their academic institution. In line with symbolic self-completion theory, we anticipated that those experiencing a high threat would compensate by expressing a stronger interest in sharing self-goal relevant social media content.

Method

Participants

A sample of 109 undergraduates, primarily freshmen, at a small liberal arts college outside Philadelphia participated in this study. Participants were recruited from an introductory psychology class in exchange for partial fulfillment of their course requirement. The mean age of the participants was approximately 19 (59 female, 50 male; $\mu_{\text{age}} = 19.13$, $\sigma = 0.94$). Participants were also informed that they were participating in a study that “measures of cognitive performance” in order to avoid biases or discrepancies in participant choices. Approval for this study was granted by Swarthmore College's Internal Review Board.

Procedure and materials

Part 1

First, participants indicated the level of importance (1 = *Not at all*, 7 = *Very much*) that having a reputation as an “intelligent person” was to their self-definition via three items (e.g., “How important is it to your self-concept that you are regarded as an “intelligent person” by others?, $\alpha = .92$). Then, they were randomly assigned to review an impressive (high threat) or neutral (low threat) resume of an alleged freshman student and were asked to consider their own accomplishments after. This was then followed by a response to three items that measured their perceived closeness to their own goal of achieving a strong resume that communicates their level intelligence (e.g., “How close are you to having a strong resume that you believe would communicate your intelligence?, $\alpha = .86$). These items were all rated on a 1 to 7 scale (1 = *Not at all*, 7 = *Very much*).

Part 2

Directly after considering their own resumes, participants viewed 12 article headlines, in a random order, that appeared as links on Facebook. Participants rated how attractive each would be to share on their own social media profile using a 1 (Not at all attractive) to 7 (Very attractive) response scale. Six articles were related to intelligence (e.g. “50 Books to Read Before You Die”) and six were unrelated to intelligence (e.g. “50 of our Best-Ever Dinner Recipes”). We averaged intelligence-related and intelligence-unrelated article headline ratings to form separate sharing attractiveness indices. After, participants were asked to select one article, from the list of 12, that they would most like to share on their own social media profile. We dichotomized intelligence-related and intelligence-unrelated article headlines as “1” and “0”, respectively. As a manipulation check, participants were also asked to indicate, on a 7-

point scale (1= Strongly Disagree, 7 = Strongly Agree), how strongly they agreed or disagreed that the resume was “impressive,” “intimidating,” “inspiring,” and if it made them feel “inadequate” ($\alpha = .86$). Finally, participants completed the Big Five Inventory-2 (Soto & John, 2017) and a brief demographic survey.

Results

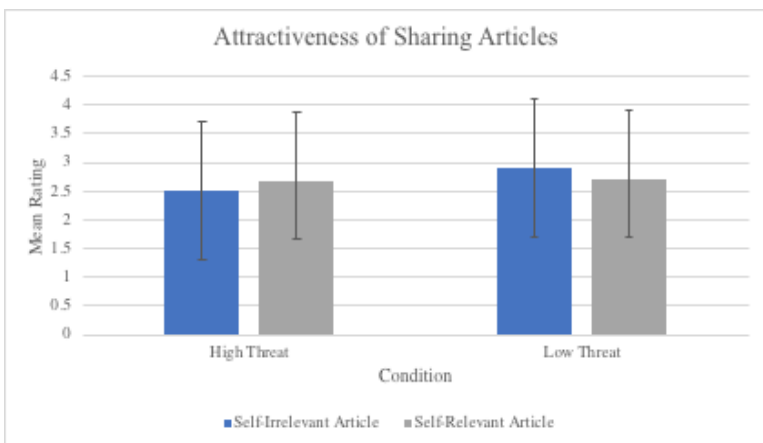
Exclusion

Participants who scored below the midpoint of the goal importance scale index ($N = 2$) were excluded from the analysis. This left a sample consisting of 107 participants for data analysis.

Manipulation Check

An independent samples *t*-test examined differences in the perceived threat associated with viewing the stronger resume, as operationalized by how strongly participants believed the resume was impressive, intimidating, or made them feel inadequate. Levene’s test indicated heterogeneity of variances; we therefore utilized a Welch’s *t*-test, which revealed that participants in the strong resume condition perceived a greater threat ($\mu = 4.61, \sigma = 1.20$) than those in the control condition ($\mu = 2.68, \sigma = 1.26$), $t(106.48) = 8.183, p < .001, CI_{95\%} [-2.40, -1.46]$.

Figure 1. *Attractiveness of Sharing Articles*

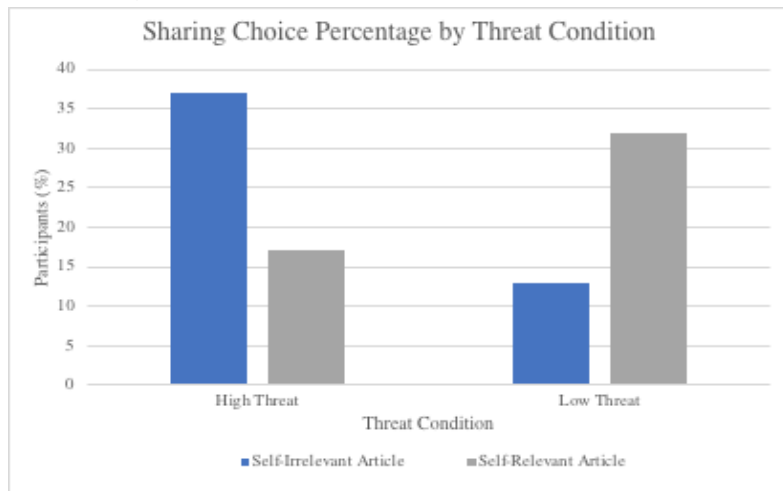


Note. Attractiveness of sharing article headlines as a function of stimuli goal-relevance. Mean and standard deviations displayed.

Analysis

In order to examine the attractiveness of sharing online articles headlines, we computed a 2 (Self-Definition Threat) \times 2 (Social Media Content) mixed-factor ANOVA with self-definition threat occurring between subjects and the content-type (social media related) within subjects. The model with online article headlines did not yield a significant effect of content type between control article headlines ($\mu = 2.69, \sigma = 1.20$) than the work-related article headlines ($\mu = 2.75, \sigma = 1.19$), $F(1, 107) = 0.431, p = .513, \eta_{2p} = .513$. No effect of self-definition threat was found, $F(1, 107) = 0.744, p = .390, \eta_{2p} = .007$; however, an interaction with content type the effect was trending toward conventional statistical significance, $F(1, 107) = 2.658, p = .106, \eta_{2p} = .024$.

Figure 2. *Threat Condition and Sharing Choice Percentage*



Note. Percent choosing to share a goal-relevant article headline on social media as a function of self-concept threat condition.

We analyzed participants’ forced choice responses to the article headlines they would share if they were required to share one with a Chi Square test to assess if the threat condition influenced preference to share a goal relevant vs goal irrelevant article headline. This analysis revealed a significant effect of the threat condition for the articles, $\chi^2(1, N = 107) =$

16.475, $p < .001$, but in the opposite direction than predicted (see Figure 1). For the article headline stimuli, participants were more likely to share goal relevant articles in the low-threat condition (32.4%) compared to the low-threat condition (17.6%).

Discussion

Study 1

Study 1 did not provide evidence consistent with the hypothesis that those experiencing self-definitional threat would demonstrate a stronger preference for goal relevant article headlines than those in the low-threat condition. However, there was partial evidence for the opposite pattern of data. Taking into consideration the Self Evaluation Maintenance Model, these findings suggest that those in the high threat condition are distancing themselves from their goals in order to reduce self-definitional insecurity by sharing alternative articles—essentially, distancing the self from the threatening domain. In order to ensure that the threat of the peer-resume was high, we told participants that it was an alleged freshman resume. This was to ensure psychological closeness (participants were primarily freshman) to the comparison target, while, ultimately, would increase the threat. However, this psychological closeness may have been a confounding factor. It is possible that participants mediated the threat by distancing themselves from their goal, rather than seeking alternative symbols of self-definition to assert their status. This behavior is consistent with the predictions of the Self Evaluation Maintenance model, which posits that when an individual feels inferior to someone who is psychologically close, they will respond by either distancing themselves from the individual, distancing themselves from the goal, or reducing the performance differential. Because the only available response to participants was to reduce the relevance of the goal to their self-definition (i.e. distance themselves from the goal) their response in this study partially supports the predictions of the Self-Evaluation Maintenance Model.

Study 2

Given that the trends from Study 1 were more consistent with the Self-Evaluation Maintenance model, Study 2 sought to test the same hypothesis but with several changes. First, data was collected from participants that had less shared experiences in order to address the concern surrounding psychological closeness. Second, stimuli were adjusted to more closely mimic content an individual may find on a social media site. Finally, adults with LinkedIn profiles were recruited to heighten the relevance of the LinkedIn manipulation and make the self-definition threat feel natural.

Method

Participants

Adults living in the United States were recruited via Amazon's Mechanical Turk to participate in a study in exchange for \$0.35. Sample size was set a priori to 400, and a final sample of 401 participants (186 female, 214 male $\mu_{age} = 38.17$; $\sigma = 11.68$) was reached before exclusions. The study design, hypothesis, exclusions, data analysis plan, and stopping rules were pre registered at aspredicted.org: <http://aspredicted.org/blind.php?x=8du7xf>.

Procedure and materials

First, participants completed the Big Five Inventory-2 (Soto & John, 2015), Work-Family Values, and Priority Goals and Life Satisfaction Scales (Masude & Sorthiex, 2011). Then, they answered questions about demographic information. Similar to Study 1, participants indicated how important (via levels of importance) having a reputation of being “accomplished” was to their self-definition via three items (e.g., “How important is it to your self-concept that you are regarded as an ‘accomplished professional’ by others?”, $\alpha = .94$). Thereafter, participants were randomly assigned to view either an impressive (high threat) or neutral (low threat) LinkedIn profile. Participants rated the six articles headlines on how attractive they were to share on their

personal social media profiles. These headlines were links (if shared on Facebook), memes, and cartoons that were either related to success (e.g. “10 Office Hacks That Will Change Your Work Life”) or unrelated to success (e.g. “11 Ways to Tell if Your Lover Loves You”). These items were rated on a Likert-type scale from 1 (*Not at all attractive*) to 7 (*Very attractive*). Participants were presented with all eighteen items and asked to indicate which they would share on their personal social media profile, if they were required to share one. They then were asked to consider their own accomplishments and respond to three items (e.g., “If others were to review your resume, how confident would you be that they would perceive you as an accomplished professional; $\alpha = .97$) on a Likert-type scale that measured their perceived closeness to their own goal of achieving a strong resume—of which communicates their status as an accomplished professional. As a manipulation check, participants were asked to indicate, on a 7-point scale, how strongly they agreed that the LinkedIn profile was impressive, intimidating, or made them feel inadequate ($\alpha = .86$) (1- *Strongly Disagree*; 7 – *Strongly Agree*).

Results

Pre-registered exclusions

Those who scored below the midpoint of the goal importance scale index ($N = 69$) and those who indicated they did not have a LinkedIn account ($N = 39$) were excluded from analyses; this was pre-registered on aspredicted.org. In total, 99 were excluded from the analysis, leaving 301 participants, 154 in the control condition and 147 in the threat condition.

Manipulation check

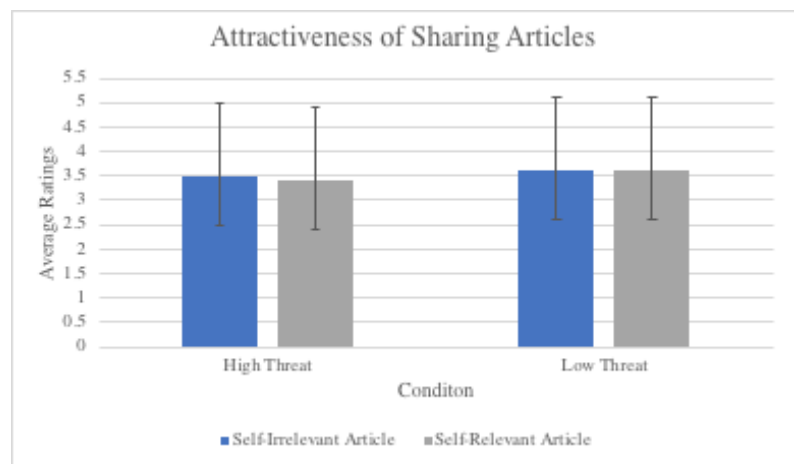
An independent samples *t*-test examined the differences in the threats perceived when viewing the stronger LinkedIn profile. This was operationalized by how strongly participants believed the resume was impressive, intimidating, or made them feel inadequate. Levene’s test indicated heterogeneity of

variances, therefore we utilized a Welch’s *t*-test which revealed that participants in the strong LinkedIn condition perceived greater threat ($\mu = 4.55, \sigma = 1.27$) than those in the control condition ($\mu = 2.13, \sigma = 0.99$), $t(274.28) = 18.35, p < .001, CI_{95\%} [-2.67, -2.15]$.

Analysis

In order to examine the sharing attractiveness of online articles, memes, and cartoons, we computed a series of three, mixed-factor ANOVA with self-definition threat occurring between-subjects and social media content-type occurring within subjects: 2 (Self-Definition Threat) \times 2 (Social Media Content). The model with online articles only yielded a marginally significant effect of content type with participants rating the work-related article headlines more favorably ($\mu = 3.65, \sigma = 1.48$) than the unrelated article headlines ($\mu = 3.52, \sigma = 1.50$), $F(1, 299) = 2.83, p = .094, \eta_{2p} = .009$, however there were no differences between threat conditions (see Figure 3). No effect of self-definition threat, $F(1, 299) = 2.24, p = .136, \eta_{2p} = .007$ or interaction with content type emerged, $F(1, 299) = 0.458, p = .499, \eta_{2p} = .002$. No effect of self-definition threat was found for either the memes, $F(1, 299) = 0.622, p = .431, \eta_{2p} = .002$, or cartoons, $F(1,299) = 0.943, p = .322, \eta_{2p} = .003$.

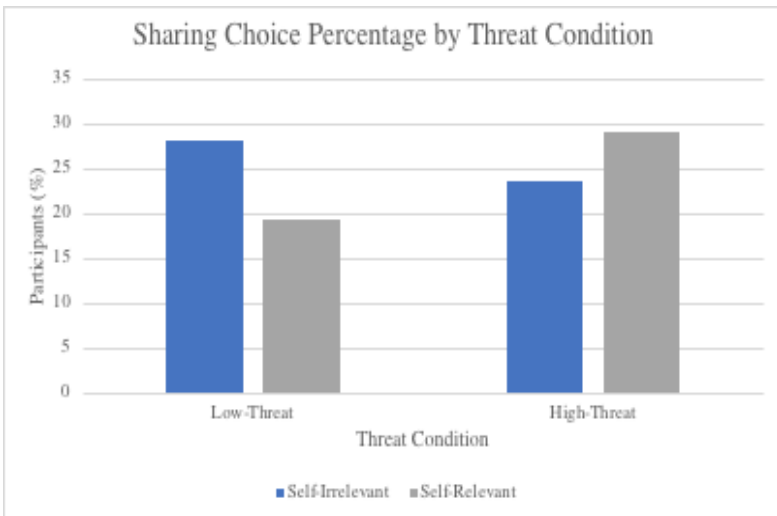
Figure 3. *Attractiveness of Sharing Articles Threat*



Note. Attractiveness of sharing article headlines as a function of stimuli goal-relevance.

Next, we analysed participants’ forced choice responses to which of each set of stimuli they would share if they were required with three Chi Square tests to assess if the threat condition influenced preference to share a goal relevant vs irrelevant article, meme, and cartoon. These analyses revealed a significant effect of threat condition for the articles, $\chi^2(1, N = 301) = 6.14, p = .013$, but not for memes, $\chi^2(1, N = 301) = 0.027, p = .869$, or cartoons, $\chi^2(1, N = 301) = 0.037, p = .848$. For the article headline stimuli, participants were more likely to share goal relevant articles in the high-threat condition (29.1%) compared to the low-threat condition (19.3%) (see Figure 3).

Figure 4. Sharing Choice Percentage by Threat Condition



Note. Percent choosing to share a goal-relevant article headline on social media as a function of self-concept threat condition..

Exploratory Analysis

Following my pre-registered data analysis plan, I explored ANCOVA models examining attractiveness ratings of articles, memes, and cartoons with goal importance (mean-centered) added as a potential moderator. The three way interaction of Threat \times Content \times Importance emerged, $F(1, 690) = 34.569, p < .001, \eta^2 = .048$. Whereas importance predicted greater attractiveness in sharing work-related article headlines among participants in the high threat

condition ($N = 362$), it was unrelated to attractiveness ratings among those in the low-threat condition ($N = 368$) (See Table 1). Importance did not predict attractiveness of sharing control article headlines in either the low-threat (See Table 1).

Table 1. Analysis from ANCOVA output.

Condition	ANCOVA Results				
	b	SE	t	p	η^2
High Threat Work Related Articles	0.229	0.075	3.056	0.002	0.025
Low Threat Work Related Articles	-0.016	0.104	0.155	0.877	0.001
High Threat Control Articles	0.12	0.075	1.6	0.11	0.007
Low Threat Control Articles	0.143	0.075	1.365	0.173	0.005

General Discussion

Study 1 and Study 2 tested the hypothesis that social media responses are influenced by a motivation to manage self-definitional threat. In Study 1, participants that viewed a resume by an individual that was psychologically close, experienced high self-definition threat via upward social comparison. These participants responded to this threat by distancing themselves from goal-relevant stimuli. However, in Study 2, when participants were confronted with a self-definitional threat through the same upward comparison, they responded by indicating a greater desire to share goal-relevant articles instead of goal-relevant memes and cartoons. This was likely due to psychological closeness being intentionally reduced in this study. As a result, only data from Study 2 provides evidence that is *partially* consistent with symbolic self-completion theory (Wicklund & Gollwitzer 1981; Harmon-Jones et al., 2009; Schiffmann, & Nelkenbrecher, 1994).

Both Study 1 and Study 2 successfully manipulated participants' sense of security with respect to their self-definition. However, the two studies yielded very different response patterns. As noted, only a few elements of Study 2 produced results consistent with symbolic self-completion in social media sharing preferences. This was seen when the self-definition threat led to an increase in the sharing of goal-related content for the article-headline stimuli, but not for the memes and cartoons. One potential explanation for this discrepancy includes the significant difference between the article headlines from the memes and cartoons. While all three sets of stimuli were associated with the self-relevant areas of interest, the article headline stimuli was focused on goal achievement and was serious. In contrast, the memes and cartoon stimuli were humorous and offered no means of goal pursuit. It is possible that the underlying tone of stimuli influenced the perceived attractiveness and desire to share them. Thus, as a whole, the data does not support the hypothesis initially made. This is because the goal-relevant set of stimuli (serious) illustrated the symbolic self-completion pattern, while the goal-irrelevant set of stimuli (humorous) did not. This is primarily speculation; future research should directly test this interpretation.

Study 1's results could be interpreted as evidence for the Self-Evaluation Maintenance (SEM) model. A possible explanation for these findings centers on the SEM model, which postulates that when individuals feel threatened, they will be motivated to distance themselves from their goal in order to maintain their positive self-concept. The SEM model suggests that a person's relationships with others have a significant impact on self-evaluation. Additionally, the relevance of self-definition and psychological closeness affects the way individuals respond to others' performances; it also determines whether or not they will experience threat (Tesser & Campbell, 1982). As clarification, psychological closeness refers to the extent to which two people are connected to one another, and can increase

due to physical proximity or similarity along demographic dimensions. In Study 1, all participants were recruited from the same small undergraduate institution and the resume from the manipulation was alleged to come from a freshman peer. An interpretation of this data, as previously discussed, relies on this model, and would suggest that when threatened by a psychologically close target, participants are likely to distance themselves from the goal to manage the threat, rather than providing external symbols to assert their status.

Limitations and Future Research

There are several limitations to our data. One being, that the data does not provide evidence for our hypothesis: a causal relationship between self-definitional threat and symbolic self-completion behavior. For this reason, future research should take context into consideration, such that threats from certain targets evoke specific responses, while threats from other targets evoke other responses. Future studies should also take into account stimulus connotation and address the confounding issue of Study 2. More specifically, the stimuli used should have similar tones rather than varied ones (humorous vs. serious), as this limited the present study. Furthermore, the present study included a small range of social media stimuli and only allowed for one type of social media behavior (i.e. sharing). Future research could examine a wider variety of stimuli, and could explore other social media engagements such as comments, likes, or caption content, that also communicate information about the self and the regulation of self-esteem.

The populations in our samples also present limitations with respect to the strength of our conclusions. All of the participants in Study 1 were college students while all of the participants in Study 2 were simply individuals that had LinkedIn accounts. Because both studies were only concerned with a professionally-oriented self-definitional domain, it is possible that there is a third variable

involved: the behaviors demonstrated in these studies are related to another factor that is shared between people who value professional identity. For instance, this could be personality type. Because evidence for symbolic self-completion theory has been found across a number of self-definitional domains that extend beyond professional identity (Arthur 1997; Schiffmann, R., & Nelkenbrecher, 1994), future research should test social media-related symbolic self-completion behaviors for other self-definitional domains. The present study does not allow for generalization, and additional research could strengthen the case for external validity.

Furthermore, this study only utilizes one approach for manipulating threats. Additional methods for threat-manipulation could be informative, especially those that more closely mirror the posts that social media users encounter on sites in naturalistic settings. Determining whether stimuli, such as Instagram posts, Facebook statuses, or inspections of other profiles, would be threatening in certain circumstances; and, under what conditions these circumstances arise has important implications for understanding how individuals employ social media tools to regulate self-esteem. Moreover, our operationalization of sharing desire is limited in the sense that it relies on self-reporting. It is possible that individuals do not have an accurate insight or access to what they find attractive to share; or, that due to demand characteristics/social desirability, they did not want to share their honest perceptions. Future research should examine sharing behaviors in a naturalistic setting, or operationalize sharing desires in a different mode. In addition, the present research demonstrated that participants experienced threat, but not necessarily incompleteness. Future research should re-test this hypothesis by employing a methodology that would more accurately make participants experience incompleteness, and not just status insecurity.

Conclusion

Our social world has forever been changed by social media sites. Social media usage is now central to the process of building, articulating, and developing relationships and statuses in peer networks. Social media also provides individuals an alternative method to connect with others in a way that feels continuous with their offline-lives (boyd, 2010). Thus, as these technologies infiltrate our everyday lives, past research pertaining to offline mediation must be updated to address the realities of our digital society.

This research provides a starting point for new insights into people's motivations for social media behavior and is one of few attempts to specify how people use social networking sites to alleviate self-concept-related anxiety and feelings of inadequacy. The research presented in this paper offers groundwork for future work in applying symbolic self-completion theory and other offline behaviors to the online space. While our data, as a whole, does not support our hypothesis, some evidence suggests that threats to self-definition may have an effect on sharing preferences and behavior; and, as a result, this merits further investigation. Subjectively, the most important contribution of this work is to provide an initial psychological explanation for the relationship between self-esteem and the social media usage motivations, rather than effects, which have been the focus of most past research.

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Elucidating the Relationship Between Legal Status and Identity Formation

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Undocumented individuals, recipients of protections under Deferred Action for Childhood Arrivals (DACA), and noncitizens generally face a greater number of financial, economic, and legal stressors that limit their opportunities for self-exploration, threatening the formation of their ego identity. While there has been extensive qualitative, interview-based research on the psychological effects of undocumented and DACAmented status on immigrant youth, comprehensive quantitative studies remain rare. To assess whether legal status is associated with psychological health outcomes and ego-identity status, I have administered the Objective Measure of Ego Identity Status (OMEIS), an inclusive, quantitative measure of identity that permits comparisons between and within groups, as well as the Beck Depression Inventory and the State-Trait Anxiety Inventory (STAI) to mostly Hispanic, mixed legal status populations (n = 139) from the Atlanta, Georgia and Durham, North Carolina areas. Results indicated that there is a positive relationship between undocumented or noncitizen status and the degree of identity formation while acknowledging the negative effects of undocumented status on mental health. Undocumented individuals scored higher on the STAI than those with legal status. However, undocumented and noncitizen populations scored significantly differently from citizens on various subsections of the OMEIS, indicating that this population has a stronger sense of identity formation. My findings thus corroborate previous qualitative research indicating that, when paired with community support, the struggles of undocumented status may, in fact, generate resilience and identity formation. Future studies may analyze sociality more directly to assess whether community embeddedness among immigrants is directly related to positive health outcomes on inventories like the STAI.

Keywords: Ego identity status, identity achievement, undocumented, Deferred Action for Childhood Arrivals (DACA), citizenship

Acknowledgments: This study was supported by funding from the Kenan Summer Fellows Program at the Kenan Institute for Ethics, Duke University. Data collection took place at churches, immigrant nonprofits, and immigration law firms in Atlanta, GA; Durham, NC; and Greenville, SC. I thank the pastors, priests, attorneys, and employees of these community sponsors for their assistance with recruitment. Correspondence concerning this article should be addressed to Alizeh Sheikh

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In June of 2012, President Obama enacted the Deferred Action for Childhood Arrivals (DACA) program, in which quasi-legal status was offered to undocumented youth who met a number of criteria, including coming to the United States before age sixteen, being younger

than age thirty-one as of June 2012, and continuously residing in the US from June 2007 to the present. Individuals who attain temporary lawful presence receive other benefits such as work authorization and a social security number (Patler and Pirtle, 2017). However, in late 2017, President Trump stated

that the DACA program would be rescinded. Although DACA remains functional, the program does not accept new applicants. The fate of DACA was challenged in the courts, culminating in a Supreme Court hearing in November 2019, with a decision expected no later than June 2020 (National Immigration Law Center, 2020).

Within the past ten years, an abundance of psychological research has assessed the barriers undocumented youth face while attempting to scale the economic and social ladder, with a recent emphasis on individuals with DACA following the initial implementation and later rescission of the program. Undocumented students cannot drive, hold jobs, or receive financial aid for college (Potochnick and Perreira, 2010). As a result, undocumented young immigrants face a number of psychological stressors due to their legal status, which induces anxiety, fear of deportation, anger, and shame, and limits access to economic mobility (Patler and Pirtle, 2018; Gonzalez, Suárez-Orozco, and Dedios-Sanguinetti, 2013). Students with DACA endure discrimination and limited access to financial aid and public higher education, which may decrease quality of life (Otiniano and Gee, 2012; Gee and Ponce, 2010). Additionally, the benefits of DACA for psychological well-being may only be short-lived. Patler and Pirtle found that distress among youth with DACA declined dramatically in 2013 and 2014, immediately after the institution of the program, but by 2015-2016 had increased to levels not statistically different from pre-DACA levels.

Research on the psychological health of undocumented individuals and those with DACA remains limited, especially concerning an analysis of identity measures. Although researchers have conducted intensive qualitative, interview-based research on the psychological effects of undocumented and DACA status, comprehensive quantitative measures have yet to be administered to immigrant youth. This study contributes to the literature by utilizing the

Objective Measure of Ego Identity Status (OMEIS), which is an inclusive, quantitative measure of identity that permits comparisons between and within groups, as well as the Beck Depression Inventory and the State-Trait Anxiety Inventory (STAI) to assess whether legal status is associated with psychological health outcomes and ego identity status. The OMEIS uses Erikson's definition of ego identity, defined as a sense of continuity, worth, and integration in personality development. This study helps fill a large gap in quantitative and clinical knowledge on immigrant youth health, since the Beck Depression Inventory and the STAI are oft-used clinical measures of depression and anxiety, respectively. The focus on identity via the OMEIS permits a more comprehensive outlook on mental health with interpersonal and individual analyses. Furthermore, this is the first study to administer the OMEIS among noncitizen youth.

Based on past studies' findings that undocumented youth, as well as those with DACA, report feeling more stressed, scared, and alone (Gonzalez et. al., 2013; Cebulko, 2014), I hypothesize that these populations will score higher on the Beck Depression Inventory and the STAI than U.S. citizens. Since undocumented students and those with DACA status have fewer educational and occupational opportunities, their ability to follow a career or academic path that aligns with their personal interests and sense of purpose is limited. Additionally, undocumented and DACAmented individuals' self-censure may prevent them from 'fitting in' within a larger societal context. Given these life stressors, I further hypothesize this population will score higher on the 'foreclosure' and lower on the 'achievement' scales of the OMEIS. The former is characterized by a commitment to various ideological beliefs with limited exploration beyond one's own. The latter is characterized by a commitment to various ideological beliefs following an investigation of other belief alternatives.

Overview of DACAmented and undocumented youths' psychological health.

Although much research has been conducted on psychological well-being among undocumented and DACA-status populations, there are only a couple of studies with larger sample sizes and none that utilize comprehensive quantitative psychological measures, a gap my research hopes to address. Generally, the literature on DACAmented and undocumented youth emphasizes how legal status can be associated with worsening mental health. A study performed by Patler and Pirtle analyzed differences in the psychological well-being of 1,102 immigrant young adults measured before and after they had attained legal status. After receiving DACA protections, psychological well-being was most strongly predicted by legal status. Gaining documentation or obtaining lawful status was associated with positive health outcomes, including decreases in stress, anger, fearfulness, embarrassment, and shame; all of these data points were statistically significant (Patler and Pitler, 2018). A qualitative, interview-based study of forty-three individuals with DACA from California corroborates Patler and Pitler's finding, with 74% of respondents reporting feeling more stressed after the rescission of DACA than they did before receiving its protections. One respondent said, "Before [DACA], they [ICE] did not know where I lived, where I worked. Now all they need to do is look in their system, and there I am ... I think about it all the time, it is very stressful" (Mallet and García Bedolla, 2019; pg. 13). Additionally, 72% of respondents reported becoming 'extremely sad' or 'depressed' since the rescission.

An undocumented status also entails social insecurity and anxiety. As Perez and Fortuna note in a study of 197 Latino mental health patients in Manhattan, undocumented Latino adults were more likely to be diagnosed with adjustment disorders, as well as have a greater mean number of concurrent psychosocial stressors than documented immigrants (5 vs. 3), with a $p < .001$. Undocumented individuals were also more likely

to have occupational problems, legal difficulties, and limited access to health care, though these results were not significant (Perez and Fortuna, 2005). Similar findings have been noted in undocumented young adult populations. Gonzalez et al. conducted a four-and-half-year study in which they carried out 150 interviews with 1.5 generation Mexican-origin youth adults who moved to the United States before the age of 12. Respondents reported devaluing themselves once they fully realized the impact of being undocumented. A majority of interviewees reported feeling a heightened sense of self-awareness and self-doubt. All respondents reported feelings of being scared, alone, distrustful, and unable to effectively integrate with other adolescents in a social setting (Gonzalez et al., 2013). They felt as though they were apart; after interviewing 42 "1.5 generation" Brazilians, Cebulko found that young adults in all legal categories of membership discussed legal status in relation to others in hierarchical terms. All undocumented young adults discussed being "lower" than others, while many of those with temporary legal status including DACA did not refer to themselves as being at the bottom of the hierarchy (Cebulko, 2014).

Method**Participants**

A sample consisting of 139 participants was recruited for the study. Participants were recruited from churches, immigrant nonprofits, and immigration law firms in the Atlanta, GA; Durham, NC; Birmingham, AL; and Greenville, SC areas. Specifically, data collection was conducted at three immigration law firms, one Hispanic congregation, and one university in the Durham-Chapel Hill, NC, areas; one immigrant nonprofit organization, three immigration law firms, and nine Hispanic congregations in the Atlanta, GA, area and one immigration law firm in the Greenville, SC area. Eligibility criteria for study participants included being at least 18 years of age. Participants were compensated

with a \$10 Walmart gift card. Approval for study procedures was obtained from the Duke University Institutional Review Board. 24% of participants self-identified as being between 18-20 years of age ($n = 34$), 23% between 21-24 years of age ($n = 32$), 9% between 25-29 years of age ($n = 13$), 24% between 30-39 years of age ($n = 34$), and 17% 40 years of age or older ($n = 24$). 62% of respondents were female ($n = 86$), and 37% were male ($n = 52$). 89% of respondents self-identified as Hispanic, Latino, or being of Spanish origin ($n = 124$), and 4% identified as white ($n = 6$). 42% of participants self-identified as citizens ($n = 58$), 27% as undocumented ($n = 38$), 12% as permanent residents ($n = 16$), and 8% as having DACA ($n = 11$).

Procedure

Data was collected via paper surveys. Participants voluntarily took part in this study in return for a \$10 Walmart gift card. They were asked to read a brief summary of the study and give their informed consent before starting the survey. About half of the surveys distributed at random required that respondents take the Beck Depression Inventory first, followed by the STAI and the OMEIS. The other half required that respondents take the STAI first, followed by the Beck Depression Inventory and the OMEIS.

Recruitment procedures differed based on whether the surveys were distributed at churches, immigration law firms, or nonprofits. Law offices and nonprofits forwarded a general email to their clients informing them about the opportunity to participate in the survey. Emails to clients emphasized that participation in the study would not affect the clients' legal consultation in any way. Surveys and informed consent forms were placed in the law office and the nonprofits' waiting rooms. The front desk at the office informed clients that surveys were available in the waiting room. Upon completion of the survey, clients turned it into the law office's front desk in exchange for a \$10 Walmart gift card.

For churches, the pastor or priest of the parish

was contacted to obtain permission to distribute surveys at the church. Once the pastor approved the project, an announcement was made at the beginning or end of service to let parishioners know about the opportunity to complete a survey. As people left the service, individuals were asked if they were interested in filling out a survey. Additionally, at informal gatherings after the services, (such as a fair or party), surveys were also distributed. Individuals returned the survey directly to the researcher in exchange for a \$10 Walmart gift card.

Materials

All three measures, as well as the demographic questions and informed consent, were available in English and Spanish. Participants were asked to select the language in which they would prefer to complete the survey.

Participant demographics

All participants were asked about their age, sex, race/ethnicity, and legal status.

Beck Depression Inventory

The Beck Depression Inventory is a twenty-one item scale that measures the severity of depressive symptoms. Respondents identify symptoms often associated with depression by evaluating their experiences over the past week. Each item ranges from a scale of zero (*minimal*) to three (*severe*). The sum of the individual item scores determines the final inventory score. Higher scores indicate a greater degree of depressive symptoms. The inventory has an internal consistency of $\alpha = .95$.

State-Trait Anxiety Inventory, Form Y-1

State-Trait Anxiety Inventory (STAI), Form Y-1 is a twenty-item scale that measures current anxiety symptoms while completing the survey. More specifically, the Form Y-1 scale measures feelings of apprehension, tension, nervousness, and worry (which constitute anxiety). Each

STAI item has a weighted score of 1 to 4. A rating of 4 designates a high level of anxiety for ten S-Anxiety items. A high rating designates no anxiety for the remaining ten S-Anxiety items. The scoring weights for the anxiety-absent items are reversed. The weighted scores for the twenty items composing each scale were added to obtain the final score for the inventory. The inventory has an internal consistency of $\alpha = .93$.

Objective Measure of Ego-Identity Status

Based on Erikson's psychosocial stage theory, Marcia (1966) developed four ego-identity statuses; (a) achievement, in which adolescents and young adults *explore* various ideologies and life plans before *committing* to one or more; (b) moratorium, in which young adults are exploring life choices but have yet to commit to any; (c) foreclosure, in which young adults have committed to and internalized various ideologies and life choices from their parents/guardians or other significant individuals without exploration; and (d) diffusion, in which young adults have neither explored possible life choices nor committed to any. The Objective Measure of Ego-Identity Status, or OMEIS, is a 64-item self-report scale that measures both ideological and interpersonal identity, providing measures of achievement, moratorium, foreclosure, and diffusion for each. This means there are a total of eight sub-scores, each consisting of a summation of eight items. Ideological identity pertains to occupational, religious, political, and philosophical values, while interpersonal identity includes analyses of friendship, dating, sex roles, and recreational choices. Each OMEIS item has a weighted score of 1 to 6. The measure has an internal consistency average of .66 and test-retest reliability of .76; it is considered the standard psychological measure of identity achievement. Internal consistency refers to the amount of correlation among different items in the inventory aiming to measure the same construct through differently worded questions, while test-retest reliability refers to the likelihood of someone obtaining the same test score upon

taking the inventory multiple times. A 2014 study in the *World Journal of Educational Research* found that the structure of the OMEIS functioned equivalently across African Americans, Caucasians, and Latinos, indicating that this measure is invariant across ethnic groups. No significant interaction has been observed for sex.

Data Analysis

To examine the relationship among the various quantitative measures and the qualitative demographic factors of race, age, sex, and legal status, I ran a univariate linear regression model testing the linear relationship between each possible combination of the explanatory and dependent variables. After finding a statistically significant univariate model, I added non-collinear factors in a stepwise fashion to obtain a full model and recorded the model's F-statistic as well as each demographic variable's respective p-value. This method allowed me to examine differences between legal status groups while controlling for confounding factors like age, which is strongly correlated with OMEIS scores (Adams et al. 1989). The categories containing the variables "Age," "Race," and "Legal Status" were collapsed into new variables to facilitate data analysis (Table 1). Since the vast majority of survey respondents identified as Hispanic, and only one undocumented individual identified as not being Hispanic, any variable concerning race and any variable concerning legal status were not included together in the same model. Additionally, since all college students taking the survey were young, had legal status, and identified as Hispanic, the variable "College" could not be included in any model with other variables concerning legal status, age, or race. However, since I obtained statistically significant univariate models between "College" and the several quantitative measures, the small population of college students ($n = 8$) was removed from the dataset and analyzed separately to control for possible confounding effects.

Table 1. Description of sub-variables collapsed from survey explanatory variables

Variable	Sub-variable	Description
Race	Hispanic	A dichotomous variable where individuals were classified as “Hispanic” if they identified as Hispanic or “Non-Hispanic” if they did not identify as Hispanic or did not specify a race.
Legal Status	Undocumented	A dichotomous variable where individuals were classified as “Undocumented” if they identified as Undocumented or “Non-Undocumented” if they did not identify as Undocumented or did not specify a legal status
Legal Status	Undocumented or DACAmented	Similar grouping as the “Undocumented” variable above, but all self-identified Undocumented and DACAmented individuals were grouped together under one level
Legal Status	Citizen	A dichotomous variable where all of those identifying as “Citizens” were grouped under one level, and those not identifying as citizens or who did not specify a citizenship status were grouped under another level.
Age	Youth	A dichotomous variable where individuals identified as being 24 years of age or younger were grouped under one level, and all those identifying as 25 years or older or not identifying an age at all were grouped under another level.

Results

Beck Depression Inventory.

No demographic variable was significantly correlated with scores on the Beck Depression Inventory (Table 2).

State-Trait Anxiety Inventory, Form Y-1.

On average, when controlling for sex and age, those with undocumented and/or DACA status scored 4.0 points, or about 9% higher on the STAI than those who did not self-identify with these statuses ($p = .07$, Table 2). When college students were included in the dataset, this value became 3.4 ($p = .11$). While controlling for sex, college students scored 7.1 points higher on average on the inventory than non-college students ($p = .08$).

Objective Measure of Ego-Identity Status.

While controlling for sex and age, citizens scored an average of 3.3 points, or about 3.4% lower on the Achievement portion of the OMEIS than those who did not self-identify with this status ($p = .08$, Table 2). When college students were included in the dataset, this value became 3.5 ($p = .08$). College students were no more likely to score higher on the Achievement portion than

others in the study, and there was no individual in the study who reached the threshold for Achievement status, defined as a score of 73+ on the Achievement subscale. Analyzing the Achievement scores further, I found that citizens scored no differently on the Interpersonal Achievement sub-scale than noncitizens when controlling for age and sex, while also excluding college students from the dataset. However, citizens scored on average 1.9 points, or 4% lower on the Ideology Achievement subscale than noncitizens ($p = .06$).

No demographic variable was significantly correlated with moratorium status, though there were several significant correlations for the other two non-achievement statuses: diffusion and foreclosure. While controlling for sex and age, undocumented individuals scored on average 6.1 points, or about 6%, lower on the Diffusion sub-scale than those with legal status ($p = .02$, Table 2). When college students were included in the dataset, this value became 5.9 ($p = .02$). While controlling for sex, college students scored on average 6.2 points, or about 6% higher on this scale than other individuals in the study, though the results were not significant ($p = .13$, $\alpha = .12$). Eighty-two individuals reached the threshold for Diffusion status, defined as a score of 53+ on the Diffusion subscale. 81% of individuals with legal status and 52% of undocumented individuals reached the threshold for Diffusion status, indicating a statistically significant difference in Diffusion classification between undocumented individuals and those with legal status ($p = .002$). Analyzing the Diffusion scores further, I found that undocumented individuals scored on average 3.3 points, or 7%, lower on the Interpersonal Diffusion sub-scale than those with legal status when controlling for age and sex and while excluding college students ($p = .01$). Likewise, undocumented individuals scored 2.6 points, or 5% lower on the Ideological Diffusion sub-scale ($p = .09$).

In regards to foreclosure status, and while

controlling for age and sex, citizens scored on average 9.1 points, or about 9%, higher than noncitizens on the subscale ($p = .001$, Table 2). However, when college students were excluded from the dataset, this value became 8.1, rather than 9.1, points higher ($p = .004$). While controlling for sex, college students scored on average 14 points, or 15%, higher on this scale than other individuals in the study ($p = .01$). 94 individuals reached the threshold for Foreclosure status, defined as a score of 53+ on the Foreclosure subscale. 86% of citizens and 78% of noncitizens were classified as reaching the threshold for Foreclosure status, indicating there is no statistically significant difference in Foreclosure classification between citizens and noncitizens ($p = .27$), despite a significant difference in score values. Analyzing the Foreclosure scores further, I found that citizens scored on average 4.4 points, or 9%, higher on the Interpersonal Foreclosure sub-scale than noncitizens when controlling for age and sex, while excluding college students ($p = .001$). Likewise, citizens scored 3.7 points, or 8%, higher on the Ideological Foreclosure sub-scale ($p = .01$).

Table 2. Association between quantitative measures and legal status adjusted for sex, and age

Variable	B	p-value	F-statistic
<i>Beck</i>			0.4859
Female	1.57	.384	
Youth	-1.51	.401	
Citizen	-0.150	.935	
Baseline	7.48	1×10^{-5}	
<i>STAI</i>			1.329
Female	0.906	.658	
Youth	-0.427	.839	
Undocumented	4.21	.073*	
Baseline	37.3	2×10^{-16}	
<i>Achievement</i>			1.685
Female	-0.913	.639	
Youth	-1.27	.516	
Citizen	-3.54	.080*	
Baseline	46.2	2×10^{-16}	
<i>Diffusion</i>			1.847
Female	-0.163	.940	
Youth	-2.46	.275	
Undocumented	-5.85	.022*	
Baseline	61.6	2×10^{-16}	
<i>Foreclosure</i>			3.405
Female	0.559	.836	
Youth	-4.92	.071	
Citizen	8.06	.004**	
Baseline	62.8	2×10^{-16}	

This study investigated the relationships between legal status and depression, anxiety, and ego identity status to determine the psychosocial effects of legal status on identity formation. I hypothesized that undocumented individuals and noncitizens would generally exhibit higher scores on both the Beck Depression Inventory and the State-Trait Anxiety Inventory. Additionally, I predicted that this cohort would score lower on the Achievement and Moratorium subscales and higher on the Diffusion and Foreclosure subscales of the Objective Measure of Ego Identity Status. As expected, undocumented individuals exhibited higher levels of anxiety than individuals with legal status. However, and contrary to my hypotheses, undocumented individuals had significantly lower diffusion scores than those with legal status, and noncitizens had higher achievement scores and significantly lower foreclosure scores than citizens. There was no statistically significant difference in moratorium scores between undocumented individuals or noncitizens and those with legal status.

The four types of identity formation assessed in the OMEIS are identity achievement, moratorium, diffusion, and foreclosure, each of which differs on whether an individual is currently experiencing a personalized crisis period of identity exploration or if they have already committed to a set of values, beliefs, and standards. Individuals who have explored and subsequently committed are labeled “identity achieved,” while those who have neither felt a need to explore identity options nor have committed to any are deemed “identity diffused.” Those who have adopted commitments without exploring available options are “identity foreclosed,” and those who are actively exploring, but have yet to arrive at a set of stable self-defined commitments are labeled as being in “moratorium” (Marcia 1966). Most individuals follow a development path through these states, whereby after a period of diffusion during their childhood and young

adulthood, they enter an exploratory moratorium. Rather than entering moratorium, however, some individuals enter a period of foreclosure whereby they accept the commitments of others (often their parents) and make no effort to question these beliefs or values. Ultimately, after exploring their identity and fomenting a set of values, an individual becomes achieved. These results indicate that undocumented individuals and noncitizens are less likely to exhibit the initial identity stages of diffusion and foreclosure and are more likely to indicate achievement. More generally, undocumented individuals and noncitizens exhibit stronger individual senses of identity than citizens.

These results contradict the notion that the challenges undocumented and noncitizen individuals face limit the self-exploration necessary for identity achievement. In fact, my findings concur with a number of qualitative, interview-based studies that aim to capture the complexity of legal status identity. For example, Ellis and Chen found that some undocumented individuals felt their experiences made them more resilient and mature rather than inhibited and disempowered. By challenging the victim narrative and reframing their experiences as an opportunity to find personal meaning, the authors found that undocumented individuals were able to persevere and achieve personal growth despite the negative outcomes of living without legal status (2013). Sociality appears to bolster these positive effects. While acknowledging that living without legal status prevented individuals from living life to the fullest by constraining their ability to disclose their legal status, pursue certain careers, and participate in certain social activities, Muñoz “found that “social networks and knowledge-empowered participants to disclose and gain a heightened awareness of their legal status identity” (2016, p. 724). When undocumented individuals feel a strong sense of community and familial support, they are particularly likely to exhibit resilience and perseverance against prejudice as well as believe their individual success benefits the overall

community by challenging the stereotypical image of undocumented people (Chang, Torrez, Ferguson, and Sagar, 2017). One quantitative study (n = 140) on ethnic discrimination also found that strong ethnic identity, which may be bolstered through community involvement, helps mitigate the negative effects of discrimination (Cobb et al., 2019). As indicated by interviews with young DREAMer activists, activism also has positive effects on self-appraisal (Seif, 2016; DeAnagelo, Schuster, and Stebleton, 2016).

This study’s large sample size (n = 139) and use of clinically approved and validated psychological measures corroborate the qualitative findings on the complexity of immigrant identity. Despite exhibiting higher levels of anxiety and thus lower levels of mental well-being, our participants demonstrated higher levels of identity formation than their citizen counterparts. I partially link these positive identity outcomes to community support. Although I did not measure sociality directly, the vast majority of data collection took place at churches, colleges, and other community spaces, and many participants completed the surveys after participating in a communal service like mass. Many of these churches work to empower immigrant communities by providing “know your rights” workshops, access to both legal and material resources like food and clothing, and a sense of shared experiences. Pastors and priests were often immigrants themselves, and they worked to affirm immigrant narratives by sharing migration stories and challenging anti-immigrant sentiment through their sermons. By understanding church affiliation as a measure of community embeddedness and support, I see these results as substantiating the positive effects of immigrant identity on identity formation, particularly when contextualized in a supportive community. Of course, the majority of this study was conducted in largely Hispanic church communities in the Atlanta, GA and Durham, NC areas, and I acknowledge these

results on positive identity outcomes may not extend to non-Hispanic populations or those without community support.

Conclusion

Overall, my results elucidate the positive relationship between undocumented or noncitizen status and identity formation, while acknowledging the negative effects of undocumented status on mental health. My findings corroborate previous qualitative research indicating that, when paired with community support, the struggles of having an undocumented status may foment resilience and identity. While scoring higher on an anxiety inventory, undocumented individuals and noncitizens were still less likely to exhibit the earlier stages of identity development and more likely to indicate identity achievement. More generally, undocumented individuals and noncitizens exhibited stronger individual senses of identity than citizens. Since data collection took place in community settings, often following a religious service, I partially link these positive identity outcomes to community support. As such, efforts to support migrant rights should not overlook work by nonprofits, particularly churches and other religious centers that create a sense of unity in immigrant communities, which may potentially buffer the negative effects of living without documentation. These results indicate the resilience of immigrants, particularly those linked to a strong community, and thereby help to counter narratives of migrants as unempowered or helpless.

This study was unable to account for the possible effects of community support, and future studies would benefit by analyzing sociality more directly to assess whether community embeddedness among immigrants is directly related to positive health outcomes on inventories like the STAI. In particular, this research is confined to Hispanic communities in the Atlanta, GA, and Durham, NC areas, and as such may not apply to smaller, more delocalized localities.

Likewise, judge-by-judge asylum and deportation decisions, as well as the extent to which local authorities cooperate with national immigration enforcement agencies, vary greatly across the country, such that the rationale for our findings would likely not fully apply to any area outside of the southeastern United States. More work must be done to assess whether differences in outcome are based on the size of immigrant communities, ethnic identity, and region, the first of which may mitigate discrimination against one's legal status.

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Constantly Connected: The Effects of Personal and Anonymous Social Media on Levels of Anxiety

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Although many studies have specifically examined the effects of Facebook on anxiety, the influence of other social media on anxiety has not been thoroughly investigated. The current study explores the effects of social media on anxiety levels and compares the differences between personal social media (social media where the identity of the user is known) and anonymous social media (social media where the identity of the user is kept anonymous). The researchers hypothesized that anonymous social media sites would be associated with lower anxiety levels than personal social media. The study included 155 college students enrolled in a psychology course. Participant anxiety levels were measured before and after a two-week period using the Beck Anxiety Inventory. Participants were divided into four groups and assigned a certain number of hours to spend on each type of social media for two weeks. The before-and-after anxiety level scores were compared using a dependent samples t-test, and the increase in scores in the four groups was compared using a one-way ANOVA. Results showed a significant difference in anxiety levels between those who used personal social media for three to four hours per day and those who used anonymous social media for one to two hours per day, along with a significant change in anxiety levels in those who used anonymous social media for one to two hours per day over a two-week period.

Keywords: anxiety, well-being, social media, health

Acknowledgements: This research was conducted while the first author was an undergraduate student at the University of the Cumberlands under the supervision of the second author and approved by a university-wide faculty committee as Presidential Scholars' Research, a distinction earned by few university students for only the most rigorous research. Special thanks to Dr. Stephen Weiss, Dr. Eric Stephens, Dr. Jane Whitaker, and Dr. Haley Turner of the University of the Cumberlands Department of Psychology.

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Defined as “computer-mediated technology that allows one to create and share information and other forms of expression through virtual communities” (Shensa et al., 2018), social media allows us to be constantly connected through a variety of smartphone apps and websites. With as many as 90% of young adults in the United States being involved in some

form of social media (Lin et al., 2016), concerns regarding the effects of consistent social media usage on an individual’s mental health are growing. Some concerns are that social media will negatively affect social skills, self-esteem, self-control, and may be related to an increase in antisocial behaviors, addictive personality traits, depression, and anxiety (Boruah & Talukdar, 2019). These concerns

have led to a growing number of studies covering the relationships between these factors and social media usage, with respect to the amount of time spent using social media and the platforms being used. However, there are many inconsistencies within the literature. While some findings indicated a negative relationship between social media and mental health, other findings indicated a positive relationship or no relationship at all (Boruah & Talukdar, 2019; Brailovskaia & Margraf, 2016; Calancie, Ewing, Narducci, Horgan, & Khalid-Khan, 2017; Ehrenreich & Underwood, 2016; Jones et al., 2016; Lee-Won, Herzog, & Parks, 2015; Lin et al., 2016; Rauch, Strobel, Bella, Odachowski, & Bloom, 2014; Shensa et al., 2018; Tsai, Shen, & Chiang, 2015; Young & Neighbors, 2016). One explanation for the discrepancies in past results could be a lack of consistency in the types of social media examined (such as studying only Facebook vs. studying multiple platforms or excluding vs. including messaging apps).

One limitation of the existing research done on social media is the focus on Facebook usage. In a study conducted by Lin and colleagues (2016), the researchers examined how different social media sites, such as Facebook, Twitter, Instagram, Tumblr, and Snapchat relate to depression. The results showed a significant positive relationship between time spent on social media per day and depression. Shensa and colleagues (2018) conducted a survey that studied the relationship between different levels of social media usage and symptoms of depression and anxiety.. Those who spent the most time on social media exhibited significantly higher levels of depression than less frequent users, and the most media connected users exhibited significantly higher levels of anxiety. Rauch and colleagues (2014) additionally found that participants experienced significant anxiety increases if they were exposed to a person in real life after studying their face on Facebook. Along with this, the study conducted by Tsai, Shen, and Chiang (2015) found that those who interacted

with ex-partners on Facebook tended to exhibit significantly higher levels of anxiety and depression. Another study found that individuals who used LinkedIn at least once a week had significantly higher depression and anxiety levels in comparison to those who never used LinkedIn (Jones et al., 2016).

People with anxiety may exhibit behaviors such as avoidance or seeking reassurance (Beesdo-Baum et al., 2012). Facebook has been found to trigger multiple trait characteristics that are related to anxiety disorders: seeking approval, fearing judgment, escalating interpersonal drama, wanting privacy, comparing selves to others, and constantly staying connected (Calancie et al., 2017). Additionally, Facebook users tend to report higher levels of self-esteem and demonstrate more narcissistic and extroverted personalities than non-users (Brailovskaia & Margraf, 2016).

The current study builds upon the existing literature on social media and anxiety, with a particular focus on the studies conducted by Lin and colleagues (2016) and Shensa and colleagues (2018). While it was acknowledged that Facebook is not the only social media site that is widely used, the study conducted by Lin and colleagues (2016) did not look at the potential differences between the types of social media. In addition, the researchers determined that there was a significant relationship between how much time is spent on social media and the anxiety levels of those who use social media, though cause-and-effect could not be concluded.

The current study aimed to examine the differences between two types of social media: sites where a person reveals their identity and interacts mainly with friends and family (personal sites), such as Facebook, and sites where a person does not reveal their full identity and interacts more with strangers (anonymous sites), such as Tumblr, and how they affect the anxiety levels of their users. While examples of specific sites may be considered “personal” or

“anonymous”, it is important to note that whether social media is considered “personal” or “anonymous” depends on how the social media platform is being used rather than the platform itself. For example, if a Twitter user lists their name when interacting with friends and family, Twitter would be considered personal social media. However, Twitter would be considered anonymous social media if the user has a false identity or username while interacting with strangers.

The researchers hypothesized that personal social media sites would yield significantly higher anxiety levels than anonymous social media types. This is mainly due to evidence that using personal social media is positively correlated with anxiety levels because of factors such as the need for approval and the ability to keep in touch with ex-partners, which are less prevalent when using anonymous social media (Tsai, Shen, & Chiang, 2015; Young & Neighbors, 2016). It was also expected that the results of this study would be similar to the study conducted by Shensa and colleagues (2018), in that those who spend more time on social media will report higher anxiety levels than those who do not use social media as much. Participants in the current study were divided into four groups. Group assignments determined which type of social media participants used (either personal or anonymous) and how much time was spent on social media each day (either one to two hours per day or three to four hours per day). It was expected that those who use personal social media for a longer duration of time will have significantly higher levels of anxiety than the other groups and that those who use anonymous social media for a shorter duration of time will have significantly lower levels of anxiety. Potential differences between those who use personal social media for a shorter duration of time and those who use anonymous social media for a longer duration of time were not assessed.

Method

Participants

This study originally consisted of 286 participants drawn from psychology courses at a small liberal arts university located in the Southeastern United States. After the second round of testing, only 155 participants had completed the study and passed the final manipulation check, leaving 54.19% of the original participants for analysis. Participants were omitted for either dropping out of the study or reporting that they did not adhere to the instructions given to them. Each student was compensated with extra credit in the psychology course for which they were registered. Of these participants, 90.32% were Caucasian, with the remaining participants being Black (5.81%), Asian (1.29%), Native Pacific Islander (1.29%), and mixed (1.29%), and 4.52% self-identified as Hispanic. 62.58% of the participants were female. The average age of the participants was 19.4 years.

Materials

The students' anxiety levels were measured using the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). The inventory asked participants to rate the degree to which they have been experiencing common symptoms of anxiety (such as ‘difficulty breathing’ or ‘shakiness’) in the last two weeks. These ratings are on a 4-point scale with 0 meaning “Hasn’t bothered me at all” and 3 meaning “I can barely stand it”. The BAI contains twenty-one items, and the total scores range from 0-63 (0-21 = low anxiety, 22-35 = moderate anxiety, >36 = high anxiety). The test has shown both high internal consistency ($\alpha = .92$) and high test-retest reliability ($r(81) = .75$) over one week (Beck, Epstein, Brown, & Steer, 1988). A 2016 meta-analysis of the psychometric properties of the BAI also showed high internal consistency ($\alpha = .91$) and high test-retest reliability of .65 (Bardhoshi, Duncan, & Erford, 2016).

Participants were also given a manipulation check after the second inventory was administered. The check asked participants to report which social media sites were used over the two-week period and the amount of time spent on each type of social media. Participants who failed the manipulation check were excluded from the final analysis.

Procedures

The researcher went to each of the participating psychology classes at the university and invited the students to participate in the study. The researcher distributed an informed consent form to the students. After completing an informed consent form, the students were given a packet with the Beck Anxiety Inventory and a basic information survey that asked for information regarding age, sex, race, and typical social media habits. The participants were then randomly divided into four equal groups using a random number generator. The course instructor assigned credit based on signed consent forms.

Groups 1 and 2 were assigned personal social media sites. Personal social media sites included, but were not limited to, Facebook, Twitter, and Instagram. Groups 3 and 4 were assigned anonymous social media sites. Anonymous social media sites included, but were not limited to, Tumblr, Reddit, and Whispr. Groups 1 and 3 were asked to use social media for three to four hours per day for two weeks. Groups 2 and 4 were asked to use social media for one to two hours per day for two weeks. All participants were asked to record and report their time on social media each day. The time spent on social media was to be accumulated over the course of twenty-four hours and was not required to be consecutive. In this study, apps used for messaging (such as Facebook Messenger and GroupMe) were not limited, since many of the participants use these platforms as their main direct communication. After the end of the two-week period, the researcher or course instructor administered the BAI for a second time in class.

Results

In analyzing the final data, dependent sample *t*-test and one-way analysis of variance (ANOVA) were used. Descriptive statistics are reported in Table 1; see Figure 1). The dependent sample *t*-test was run to analyze the differences between Time One and Time Two for each group (see Table 2), and the one-way ANOVA was used to compare the differences in the mean anxiety level of each group.

Descriptive Statistics

Analysis of descriptive statistics shows that Groups 1 and 3 did not change over the course of the two weeks ($M = .44$, $SD = 8.30$; $M = -.62$, $SD = 6.00$, respectively). Group 1 showed a slight increase in anxiety over two weeks, while Group 3 showed a slight decrease in anxiety. Group 2 decreased as well ($M = -1.64$, $SD = 6.40$), but Group D had the largest average change in the overall scores between Time One and Time Two ($M = -3.23$, $SD = 7.63$). This indicates that the combination of anonymous social media and a short amount of time spent on social media yields the greatest amount of change in overall anxiety levels.

Dependent Samples *t*-test

Overall, significance between Time One scores and Time Two scores were only found in Group 4 ($t(35) = -2.58$, $p = .014$). Group 2 also showed marginal significance ($t(43) = -1.70$, $p = .097$). Both of these groups were instructed to use social media for one to two hours a day for two weeks, which suggests that using social media for a shorter duration of time yields lower anxiety levels. However, due to the differences in significance, one can also infer that the type of social media used has some effect on anxiety as well, with anonymous social media being less anxiety-inducing than personal social media.

One-way ANOVA

A one-way ANOVA was used to compare the mean difference in anxiety levels between the four groups, and a Fisher's Least Significant

Difference (LSD) post-hoc test was conducted to compare the differences between the individual groups. The ANOVA itself did not show statistical significance ($F(3,151) = 1.85, p = .14$), but the post-hoc test did show a significant difference between Group 1 and Group 4 ($p = .024$). This demonstrates that the combination of a short duration of time and anonymous social media yields lower anxiety than the combination of a long duration of time and personal social media. The results of the post-hoc test show that the amount of time and the type of social media being used are both factors of anxiety levels.

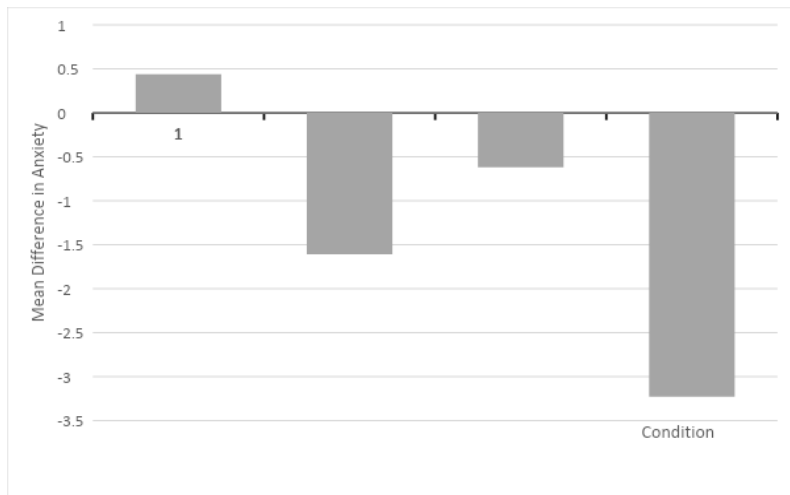
Table 1. Descriptive Statistics

GROUP	M (DIFFERENCE IN ANXIETY)	N	SD (DIFFERENCE IN ANXIETY)
1	.44	41	8.30
2	-1.61	44	6.40
3	-.62	34	6.00
4	-3.23	36	7.63

Table 2. Dependent Samples t-Test

GROUP	t	df	p
1	.34	40	.737
2	-1.70	43	.097
3	-.60	33	.552
4	-2.58	35	.014

Figure 1. Mean Difference in Anxiety by Condition



Discussion

The effect of social media on anxiety levels is an understudied area of study because of the relative

newness of social media. Social media has become more prevalent globally, making it imperative to further understand its effects on anxiety in users. The current study found that the combination of anonymous social media (social media sites on which a person uses an anonymous identity and interacts mainly with strangers) and the short amount of time spent on social media (one to two hours per day) yielded significantly lower levels of anxiety than those who use personal social media for a long duration of time (three to four hours per day), providing support for the original hypotheses that anonymous social media and a shorter amount of time spent using social media would yield lower anxiety levels than other groups. This group also showed significantly lower anxiety levels at the end of the two-week period than at the beginning. The group that used personal social media for a short amount of time yielded marginally lower anxiety levels at the end of the two-week period. These results suggest that the amount of time spent on social media has a stronger effect on overall anxiety levels than the type of social media being used. However, the differences in significance propose that the type of social media may have a marginal effect on anxiety levels as well. The findings indicate that the combination of anonymous social media and a short duration of time spent on social media was most effective in reducing anxiety levels, which suggests an interaction between these factors.

There are many possible reasons for the difference in anxiety levels between personal social media and anonymous social media, which were not explored during this process. Some ideas include the lack of interaction with people that a person knows and may have negative feelings toward, such as an ex-significant other (Tsai, Shen, & Chiang, 2015), who a person would not know they were interacting with if using anonymous social media platforms. Personal social media also includes professional sites such as LinkedIn, which can cause anxiety for a person who is

searching for a job and experiencing difficulties (Jones et al., 2016). Posting on anonymous social media may be less anxiety-inducing because the posts are less likely to negatively affect a person's personal life, while posts on personal social media can easily be tied to a person and cause problems with relationships, work, or public image.

The results of this study show mixed correspondence with previous research. As expected, the results of the current study support the findings of Shensa and colleagues (2018), who found a significant positive relationship between the amount of time spent on social media and level of anxiety. However, while Shensa and colleagues found a correlation between social media usage and level of anxiety, the experimental design of the current study suggests that spending a greater amount of time on social media will lead to higher anxiety levels.

While the current study could not identify a specific threshold for the amount of time spent on social media necessary to elevate anxiety levels by a significant amount, the lower scores found in the groups that used social media for one to two hours per day suggest that the threshold may be between 2 and 3 hours per day. However, further studies are needed to determine the amount of time needed to make a significant difference without the interaction of the type of social media, since the group using personal social media yielded only marginally lower anxiety levels.

This study is not without limitations. One limitation is that self-report methods were used, both in the usage of the Beck Anxiety Inventory and in the reporting of how much time participants spent on social media for the duration of the study. While the BAI has been found to be a reliable measure, the self-report of the time spent on social media could not be verified, making it possible that participants did not use social media as directed during the two weeks. Nonetheless, participants were given a

chance to report their usage of social media during a manipulation check, and those who reported not using social media as directed were excluded from the study. Future studies should investigate alternative methods to regulate participants' social media usage, such as tracking social media usage via a smartphone application, or requiring participants to submit a log of social media usage.

Another notable limitation of this study was the small sample size. Due to the small size of the university, it was difficult to recruit a large number of participants for this study. Invited students were not required to participate, and many withdrew from the study for various reasons or were excluded from data analysis due to inadequate adherence to study instructions. Despite the small sample size, this study did offer some insight into what a study with a larger sample might find. Additionally, the sample lacked diversity. While there was a balance among genders, the majority of the participants were Caucasian, and all participants were college students enrolled in psychology classes. These sample limitations reduce the study's reliability and the ability to generalize findings to a larger population. Future studies should aim for a large, diverse sample for the study or should investigate the effects on social media on groups that are underrepresented in the current study.

In addition, this study also did not account for outside factors that may have been affecting the anxiety levels of these participants. Participants were all college students, and therefore may have been experiencing anxiety due to factors other than social media, such as classes, family problems, relationships, or work. However, participants were given an opportunity to disclose any significant stressors in the manipulation check, and those who reported a significant stressor were not included in the final results of the study. Despite this, it remains a possibility that some students did not report any outside stressors and were included in the study.

This is another limitation that may be solved by a larger sample size, as the greater number of participants would mean less outside influence on the overall data.

Despite these limitations, this study was able to provide information about a cause-and-effect relationship that has not been the topic of much of the existing prior research. These findings provide support for the studies conducted by Lin and colleagues (2016) and Shensa and colleagues (2018). Both of these studies showed a correlational relationship between time spent on social media and anxiety. The current research built upon this and added the element of a causal relationship. This study was also the first to define a difference between personal and anonymous social media sites, an area that needs further analysis. This research provides some evidence that social media usage has a negative effect on our anxiety levels, implying that people should regulate their social media usage to minimize anxiety levels. This also supports the idea that the type of social media and the amount of time spent on social media are both factors in anxiety levels, but mainly that the interaction between the two has the largest effect on anxiety levels. Future research should continue to study this interaction, attempt to define other types of social media, and determine which types may have the largest effect. Along with this, a threshold amount of time spent on social media needed to affect anxiety levels has not yet been determined, though this study may show that it may be somewhere between two and three hours. This threshold amount of time should also be considered in future research. Overall, the exact effect that social media has on a person's anxiety levels is still unknown, but this study provides support for the idea that social media can have a negative effect on its users.

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Emotion Regulation in PTSD: A Memory-Based Approach

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In recent years, memory has become a hot topic in both cognitive psychology and neuroscience. In this literature review, we focused on the emotion regulation abilities of memory retrieval, as it relates to the occurrence and maintenance of Post-Traumatic Stress Disorder (PTSD). PTSD is a widely studied topic in both clinical and cognitive psychology. However, memory-based theories of PTSD and the role of memory as an emotion regulation tool has not been fully investigated. Functions of memory we examined include generating a reference point for an individuals' view of their world, self, and future, and how memory affects an individual's mental state, which are all important factors in PTSD. This article will examine how traumatic memories affect an individuals' mood and how the emotional effects of this trauma influence emotion regulation processes in the present time. Research showed that the retrieval of a traumatic memory may have unhealthy psychological effects.

Keywords: PTSD, emotion, emotion regulation, memory-based approach

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In recent years, neuroscientists have been paying increasing attention to the connection between memories of the self and our emotional experiences (Holland & Kensinger, 2010; Engen & Anderson, 2018). One of the functions of memory retrieval - emotion regulation - has been examined by several studies, connecting emotion regulation to a variety of subjects. Memory has been found to affect emotional state, wellbeing, cognitive processes, and social cognition (Rustlin, 2000; Figueira, 2017). This involvement in fundamental functions makes it a crucial factor in understanding how memories modulate one's experience of life, especially with mental disorders. These connections can help us determine a person's attitude towards certain situations that maintain their psychological disorders, such as depression and post-traumatic stress disorder (PTSD) (Palacio-

Gonzalez, 2018). In this review, we will examine the role of memory on the occurrence and maintenance of PTSD. Furthermore, we will also investigate a memory-based theory of PTSD and the function of memory retrieval as an emotion regulation tool.

Analysis

The mechanisms under which PTSD occurs and is maintained is under investigation, but many theories attempt to explain it. The literature revealed that memory recall plays a regulatory role on a person's mental state, current mood, and future-oriented thinking, which can be affected by this process (Rustlin, 2000; O'Neill, 2002). A trauma or trauma-like memory is the basis of PTSD's influence on a person's thought process and ability to regulate emotions. Memories are an important aspect of PTSD

because they are reference points for individuals' view of self and the world they live in (Berntsen, Willert, & Rubin, 2003). Retrieval of memory could have specific and psychologically unhealthy results. In this review, we will examine the effects of traumatic memories on the occurrence and progression of PTSD, and the emotions that are re-experienced when individuals remember these traumatic memories. We conclude that how one regulates their emotions when a traumatic event occurs and when they later retrieve the traumatic memory plays a specific and crucial role in the occurrence of PTSD.

PTSD

PTSD follows a stressful event which (a) is experienced or witnessed by one who had direct exposure to a serious injury, a physical threat, actual or threatened sexual violence to self or others, (b) learning that a relative was exposed to a trauma, or (c) indirect exposure to details of the trauma via professional duties and was then followed by intense fear, helplessness or horror (McNally, 2003; American Psychiatric Association, 2013). The occurrence of PTSD is explained by the experience of the stressful event, but it is equally important to study the factors that maintain it. These autobiographical memories may function as reference points in a person's life which affects the meaning attributed to other memories as well as perception and expectations of future events (Berntsen, Willert, & Rubin, 2003). The memory stays highly accessible for years, is retrieved in response to internal and external triggers, and may function as a turning point for one's life narrative; all such factors lead to overestimation of future traumatizing events (Berntsen, 2001). Traumatic memories may encourage one to oversimplify what happened. Oversimplification of the traumatic event can spark behaviors such as self-blaming, feelings of shame and guilt, and rumination. Such behaviors are unproductive because they are self-centered instead of event-centered. From the first appraisal of the traumatic event, a person finds various implications of the trauma which then generates

negative emotions. Abundant evidence shows that feelings of guilt, shame, sadness, betrayal, humiliation, and anger frequently accompany PTSD (Brewin & Holmes, 2003). The generation of negative emotions is associated with oversimplification and self-blaming behavior.

Traumatic memory as a reference point

In the clinical literature, it is hypothesized that traumatic memories are reference points that disturb life-narratives because they are incoherent with most of the normative events and not integrated into the concept of self. Because these memories are distinct from other memories that are central to the life of the person, intrusions and rumination typically follow a traumatic event (Horowitz, 1986). Horowitz proposed that the brain is attempting to process these memories and until it can do so, the repeated recollection of that memory occurs. Furthermore, lack of integration leads to increased accessibility of the traumatic memory and they are kept in a special memory region in the brain where intrusive and repeated thoughts arise. There is a fluctuation between having intrusions of the memory and avoiding the emotional content because of the highly negative emotional recollection of the traumatic memory (Horowitz, 1986). Congruent with Horowitz' theory, Brewin proposed a dual-memory processing system for traumatic memories in which some parts of the trauma memory are accessible for conscious retrieval (VAM - verbally accessible memories) while other parts are only recalled via situational cues (SAM - situationally accessible memories) (Brewin & Holmes, 2003). At first, VAM contains little contextual details and emotional content compared to SAM, the process is completed when the details of traumatic memory are integrated into VAM. During this process of integration, memories in SAM are recalled in the form of intrusions and flashbacks (Ehlers & Clark, 2000). Brewin theorized that lack of integration is what causes PTSD development and maintenance (Brewin &

Holmes, 2003). As Brewin suggested, with the integration of traumatic memories into the concept of self and memory system, symptoms of PTSD will decrease and eventually vanish. However, in recent years, evidence has surfaced that opposes what Brewin has proposed.

In these theories as well as clinical literature, traumatic memories are associated with the involuntary recall of memories as intrusions or flashbacks. These memories are fragmented and incoherent with personal narrative, so they are isolated and disintegrated. In these theories as well as clinical literature, traumatic memories are associated with the involuntary recall of memories as intrusions or flashbacks. These memories are fragmented and incoherent with personal narrative, so they are isolated and disintegrated. However, new evidence showed that involuntary memories are not just part of the traumas or highly negative events (Berntsen, 1996; Berntsen, 2001). In the diary study, it was reported that various autobiographical memories that differ in emotional valence and intensity are also retrieved involuntarily. In addition, opposed to the clinical literature, Berntsen found that the memory of a traumatic event is rich in contextual and emotional details when remembered involuntarily. Recent memory-based theories claimed that these traumatic memories in PTSD are central to a person's identity as well as life story; highly accessible both voluntarily and involuntarily and they serve a reference point for other, less emotionally salient memories. Having a traumatic memory be central to one's identity and be highly accessible leads to vivid, intrusive memories and distorted view of self, world, and future (Berntsen & Rubin, 2006). Traumatic memories are memories with extreme negative emotions and there exists a mechanism that modulates the effect of these emotions on an individual's mental state.

Emotion regulation processes

Here we will discuss the emotion regulation process and commonly used emotion regulation strategies. Emotions are behavioral,

physiological, and experiential response tendencies that modulate an individual's behavior and responses to perceived challenges and opportunities. How one appraises emotions determines their emotional expressions (Gross J., 1998). Emotions facilitate decision making (Oatley & Johnson-laird, 1987), regulation of rapid motor responses (Schwarz & Clore, 1983), modification of social interactions by understanding others' intentions, and generation of social behavior (Averill, 1985).

Emotion regulation is the process that influences emotional responses as well as an emotional expression that can increase, maintain, or decrease negative and positive emotional responses (Gross J., 1998). This regulation can be done intentionally or not. At the basic level, there are antecedent-focused and response-focused emotion regulation strategies. Antecedent-focused strategies modify emotion response tendencies before activation of emotions, so they change behavior, expression, and physiological responses. Response-focused strategies, on the other hand, occur after the generation of emotions and regulate emotional expression (Gross, 2002). The distinct effects and similarities between cognitive reappraisal and expressive suppression have been studied broadly. Reappraisal involves construing emotion-eliciting situations in non-emotional terms whereas suppression is about inhibiting ongoing emotion-expressive behavior. Via cognitive reappraisal, individuals can alter emotional response tendencies which can lead to less intense experiential, behavioral, and physiological responses. Suppression, on the other hand, involves merely decreasing one's expressive behavior but it has no actual effect on the emotional experience, and may even enhance physiological responses because of the effort to inhibit one's natural responses (Richards & Gross, 2000).

Memory Retrieval as an Emotion Regulation Tool

Traumatic memories are memories of their own so it would be beneficial to understand the role

of the memories in emotion regulation and how they initially affect an individual's emotional state. In this section, we talk about the function of memories in emotion regulation and how their characteristics influence one's ability to regulate their emotions.

Memory is one of the brain's self-generated mechanisms, a source of emotional state, and any emotional effect on a person outside of their immediate emotional experience is mediated by memory (Engen & Anderson, 2018). Episodic memory can evoke neural, physiological, and subjective reactions mimicking those of the original experience (Daselaar, et al., 2008; Engen, Kanske, & Singer, 2017). Recall of traumatic episodic memories can also lead to the rumination of emotional events and re-experiencing the emotions from the past. Humans naturally make predictions, but to do so, individuals engage in an episodic prospection process that can produce emotional reactions even though triggering events are not occurring (Schacter, Addis, & Buckner, 2008). Prospecting and re-experiencing self-generated emotional states play a central role in psychopathology because there is an intense emotional reaction in the absence of apparent stimuli (Morina et al., 2011). Modulation of accessibility of these memories can affect generated emotional responses as well as regulating emotions (Gross & Barrett, 2011; Gross, Sheppes, & Urry, 2011). Because our emotions are mostly driven by memories, controlling the accessibility of those memories will be an effective way of regulating an individual's emotional reactions (Anderson & Hanslmayr, 2014). The memory of an event can generate certain emotions and by regulating the accessibility of memories, individuals can moderate their emotional reactions.

Holland's research on our memory's ability to evoke emotional reactions claims that the emotional significance of an event, its consequentiality, how detailed the memory is retained, and personal involvement are key factors in memory accessibility (Holland &

Kensinger, 2010). Recent studies showed that arousal enhances memory recall; memories with high 'consequentiality' and high personal involvement and/or self-relevance are also more likely to be remembered than events with low personal involvement. Another emotional characteristic of memory is its valence, which can also influence how likely an autobiographical memory is to be remembered (Depue, Curran, & Banich, 2007). Studies showed that individuals remember positive events more than negative events which can be explained by self-referential processes. Most people's self-schemas are generally positive and those memories with a positive valence are more likely to be remembered because of the "mood-congruency effect" (Mayer, 1995, p. 8). In addition, when individuals are depressed, negative self-concepts are more accessible to them—negative experiences are more easily remembered compared to positive ones. Other than several characteristics of memories which are effective on the accessibility of memories, an individual's self-schema and mood also play crucial roles in what we remember.

Emotional arousal improves memory rather than impairs it. Regardless of the valence of the emotion, intense memories are recalled more frequently both voluntarily and involuntarily (Hall & Berntsen, 2008), they are more vivid – feeling of re-experiencing –, and are better integrated into a person's feeling of self and identity (Talarico, Labar, & Rubin, 2004; Conway, 2005). This rehearsal and centrality, in turn, helps maintain the memory and its emotional intensity. Therefore, highly emotional events (both positive and negative) integrate the concept of self by forming reference points for other less salient memories. Such personal reference points impact the perception of events and the construction of future expectations. By using these memories, a person generates and modifies current beliefs, feelings, thoughts, and behaviors (Pillemer, 1998). The distinction between highly positive and negative events is that normative events produce cues for making

meaning, as well as structuring life narrative and improving well-being whereas traumatic events, which are rare and uncontrollable, may be harmful to mental health (Berntsen, Willert, & Rubin, 2003). These traumatic memories are more likely to form multiple associations with other autobiographical memories which disturbs the concept of self (Berntsen, 2001).

As reference points serve the function of meaning-making and generating expectations, and traumatic memories are generally highly accessible, a person with a traumatic memory is likely to overestimate the general frequency of such events as well as the likelihood of being traumatized again. One manifestation is unnecessary worrying, such as avoiding certain classes of events, as they are perceived as involving risks or a sense of constant threat, associated with symptoms of hypervigilance in PTSD (Ehlers & Clark, 2000). High accessibility of these “landmark memories,” according to Berntsen, leads to rumination and as a positive feedback loop. Rumination thus rehearses traumatic memories and increases their accessibility. Increased access may also explain why traumatic memories are retrieved involuntarily. In addition, emotional content may distort perceptions of subsequent events that would otherwise be perceived as neutral or even positive. This may lead to unnecessary worries and increased levels of intrusions and avoidance (Berntsen & Rubin, 2006). Research on intrusions and re-experienced emotions through involuntary autobiographical memory retrieval has found that individuals with PTSD reported more intense depression, anxiety and guilt related to their intrusions (Brewin & Holmes, 2003). Also, involuntary memories of trauma had a greater impact on mood in contrast to voluntary memories, also showing greater negative mood change in response to memories (Rubin, Berntsen, & Bohni, 2008). It has been suggested that autobiographical memories associated with trauma are highly accessible and have a greater negative emotional impact upon retrieval compared to individuals with no

symptomatology. As being highly accessible, these memories generate great emotional reactions as well as affect other factors such as an individual’s self-schema, mental state, and other memories.

The centrality of event, proposed by Berntsen (2006), is a term that defines the effect of a memory on the organization of other memories and self-perception. As explained above, memories that are vivid and highly accessible are reference points for other memories and future assumptions. In the occurrence and maintenance of PTSD, traumatic events and memories of a traumatic experience play a significant role in distortion in cognition, schemas, and assumptions. In recent research, it was shown that high centrality of a traumatic event was correlated with depression, anxiety, dissociation, neuroticism, and repressive coping (Berntsen & Rubin, 2007). In one study, it was found that a high centrality of traumatic events was related to dysfunctional emotion regulation strategies (Palacio-Gonzalez, 2018). However, differentiation in event centrality regarding the valence of the memories and emotion regulation strategies commonly used in the retrieval of these memories has still not been investigated. Future research should examine if traumatic and normative memory retrieval differs in state emotion regulation strategies and what their effects are on emotional states during memory retrieval. Furthermore, more information on the flexibility and use of different emotion regulation strategies in short-term and long-term influences on traumatic memory characteristics would be beneficial for PTSD treatments. Also, on the same subject, individual differences regarding PTSD vs non-PTSD would be an interesting area to study, as known, every trauma does not evolve into PTSD and individual differences play a key role in this subject (Rubin, Berntsen, & Bohni, 2008). Trait emotion regulation strategies, emotion regulation flexibility, executive function ability – specifically inhibition and attention – accompanied emotion regulation strategies with

trauma memory and usage of different emotion regulation strategies and their short-term and long-term effect on the memory of trauma could be some topics for future studies.

Conclusion

In this review, we examined the functions of memory retrieval in terms of emotion regulation especially as it relates to the maintenance and occurrence of PTSD. Research on the effects of memory revealed that memories of the past directly influence several processes such as an individual's emotional state, cognitive processes, and social cognition. We concluded that any kind of effect other than the immediate experience of an emotional situation is mediated by memory. There are controversial findings in the literature on PTSD. Most of the articles agree that traumatic memories are reference points for other less salient memories and individuals and that they disturb the concept of the self. Nonetheless, there are incompatible results about what defines a traumatic memory. Characteristics of memory such as accessibility and emotional significance will determine the effect of retrieval on an individual's emotional state as well as how detailed the memory will be retained. The centrality of an event, which is about the centrality of memory on an individual's identity, is a key factor to determine the impact of memory. Highly central memories can affect an individual's emotional state as well as self-perception. There are researches that examined the effect of distinctive emotion regulation strategies on memory retrieval, however, most of these studies examined this via determination of trait emotion regulation strategies which are the common strategies individuals use. In the topic of PTSD which involves extreme emotionality, it would be beneficial to examine whether there is a distinction between trait and state emotion regulation strategies and whether the impact of the emotional intensity of traumatic memories on emotion regulation strategies differs or not. Finally, individual differences that are influential on the occurrence of PTSD and prevention of

PTSD when an individual faces a traumatic event would be an interesting area to study. Future research of the topic could include the characteristics of traumatic memories, their effects on emotion regulation, and preventive factors against the occurrence of PTSD.

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The Relationship Between Religious Trauma, Sex, Gender Roles, and Sexuality of Adults in the United States Using Social Identity Theory

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Psychological research has largely neglected to address religious trauma, or the harm committed by religious institutions. This dearth of research on religious trauma compiled with the lack of research on marginalized identities such as sexual and gender minorities, allows for not only inadequate scholarship for developing interventions but perpetuation of the ideology that religious institutions are solely healing entities. Additionally, the amount of research on the specific impact of religious trauma on a person's self-identity is insufficient to properly measure the range of mental health issues that can arise as a result. This paper emphasizes the power of integrating niches from different branches of social science: utilizing Black feminist theories, such as intersectionality, and the psychological framework of social identity theory to explore more culturally sensitive interventions for marginalized individuals. This includes individuals especially vulnerable to institutional harm in religious settings, which hold significant amounts of normative power and moral influence. Future research should examine the ways in which the racial and class aspects of identities intersect with gender and sexual orientation in how religious trauma impacts the mental well-being of marginalized individuals.

Keywords: religious trauma, gender, social identity theory, intersectionality, feminism

Author Note: Rebekah Monroe, Department of Psychology, Northeastern Illinois University. A huge thanks to several people that helped support me in this process including Adam Dorhauer, Renan Braulino, Rachel Kuehl, Dr. Olivia Perlow, Dr. Laurie Fuller, and Dr. Jon Hageman.

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The Relationship Between Religious Trauma, Sex, Gender Roles, and Sexuality of Adults in the United States Using Social Identity Theory

Control by stigmatization and violence has long been a tool for social oppression by those in power, and religious groups are no exception (Lucas, 2003; Morrow, 2003; Stone, 2013; Weishaupt & Stensland, 1997). Unfortunately, these religious groups have avoided much scrutiny within psychological research (Collins, 2009; Morrow, 2003; Stone, 2013). Research on gender in relation to organized religions is rarely

explored, particularly in regard to religious teachings and traditions that position women as inferior to men (Matlin, 2012; Weishaupt & Stensland, 1997). Even rarer is research that examines gender from the feminist perspective, which posits heterosexuality as a socially constructed and hegemonic concept (Collins, 2009; Flanders, 2016). In fact, the PsycINFO database only produces seven peer-reviewed results from the keywords “*religious trauma*.” In contrast, an abundance of scholarship on the topic of religion exists as a coping mechanism for trauma, but again, not as a source of trauma itself. However, it is worth clarifying that not all

religious groups are oppressive (Stone, 2013). This paper will focus on religious institutions that have caused harm to sexual and gender minorities (Flanders, 2016; Lucas, 2003; Stone, 2013). It will also examine the relationship between gender, sexuality, and religion using a framework based on *Social Identity Theory* with a feminist lens in hopes of deconstructing the power hierarchies within hegemonic ideologies to produce more effective interventions for those impacted by religious trauma in the United States (Tajfel & Turner, 1979).

There is a historical nature of gender and sexual discrimination and prejudice that religious groups tout within their doctrines. For example, a study by Nagoshi et al., (2018) tested levels of homophobia and transphobia in undergraduate students and found both to be positively correlated with religious fundamentalism and right wing authoritarianism. Such belief systems have disproportionately targeted non-heterosexual individuals as well as feminine-identified individuals (including cis-gender women, trans women, and non-binary conforming individuals perceived as feminine) (Flanders, 2016; Nagoshi et al., 2018; Weishaupt & Stensland, 1997; Yeck & Anderson, 2018). Furthermore, the homophobic and transphobic prejudice upheld by many fundamentalist religious institutions is also endorsed by a lack of protective government policies (International Lesbian, Gay, Bisexual, Trans and Intersex Association, 2017). For example, punishment for being non-heterosexual can be as severe as execution in Saudi Arabia, a country that the U.S. has worked closely with as an ally for several decades (Yeck & Anderson, 2018). Social identity theory is particularly useful for analyzing affected religious groups and individuals because it considers an individual's self-identity relative to social groups (Tajfel & Turner, 1979).

Central Concepts

Coined by Winell (2012), *Religious trauma syndrome*, is trauma experienced whilst a member participates in, or after leaving, an

organized religion (Levin & Ortiz, 2018). Religious trauma has been likened to PTSD by researchers because of the similar symptoms present in individuals dealing with both disorders (Stone, 2013). For example, one key symptom of religious trauma is avoiding stimuli associated with religious institutions and practices due to the extreme stress experienced when redolent stimuli are encountered (Stone, 2013). Additional symptoms observed among survivors of religious trauma include feelings of grief, depression, and a general loss of trust and suicidal ideation (Matthews, 2017).

Religion has been defined by several researchers as a form of organized worship in an institutionalized setting (Halkitis et al., 2009; Matthews, 2017; Tuthill, 2016). Religiosity is often seen as distinct from *spirituality*, which is generally seen as an individual's private relationship with their deity (Halkitis et al., 2009; Matthews, 2017; Tuthill, 2016). Identifying as *religious* has been related to an expectation of attending public gatherings in an institution in addition to following a particular religious doctrine (Halkitis et al., 2009; Matthews, 2017; Tuthill, 2016).

The acronym, LGBTQIA+, stands for lesbian, gay, bisexual, transgender, queer, intersex, asexual plus any other way of identifying a person's gender and sexual orientation, as feminist and queer perspectives contend that a spectrum exists and that even these categories within the acronym are not rigid (Houdenove, Gijs, T'Sjoen, & Enzlin, 2015; Serano, 2007). *Gender* refers to the socially perceived identity of a person's role, which is distinct from, yet often associated with, a person's sex assigned at birth (Matlin, 2012; Serano, 2007). *Sex* focuses on the biological traits of a person. It is commonly assumed that only two sexes (male and female) exist, completely denying the existence of *intersex* people in the biological spectrum (Dunham & Olson, 2016; Matlin, 2012). For example, a person is *cis-gender* if they present themselves in a feminine manner,

pass as a woman, and were assigned as a biological female at birth (Serano, 2007). *Transgender* refers to a person who transitioned from one gender to another (Serano, 2007) while the term, *asexual*, usually refers to a person that experiences a lack of sexual attraction (Houdenove, Gijss, T'Sjoen, & Enzlin, 2015). The term *queer*, or *genderqueer*, denotes a denial of a man/woman binary and is considered non-binary conforming (Serano, 2007).

Social Identity Theory (SIT) is an individual's sense of self in reference to group subscription consisting of three main components: social categorization, social identification, and social comparison (Tajfel & Turner, 1979). These three mental processes occur in consecutive order, and are used for developing self-identity or self-concept as well as denoting social groups as either in-groups or out-groups. The in-group is the social group an individual identifies with, and any other groups deemed as opposing their identity are out-groups (Tajfel & Turner, 1979). This framework, along with intersectionality theory, will be used to explore the following topics: (1) the modern relationship among gender, LGBTQIA+ identities, spirituality, and religion as well as definitions of these constructs; (2) the effects of being labeled as inferior or deviant and labeling one's self in regards to the hegemonic ideology of an individual's respective religion; and (3) the use of social comparison and control as methods for social oppression (Flanders, 2016; Tajfel & Turner, 1979).

Social Identity Theory

Social Categorization

The first component of *Social Identity Theory* is social categorization, the first stage of the mental process where an individual assigns themselves and other people to one or more categories (Tajfel & Turner, 1979). Categorization is a cognitive process involving understanding and identifying people; however, this process often evolves into stereotyping (Schacter, Gilbert, Nock, & Wegner, 2017). Stereotyping is the process of

drawing conclusions based on the different categories a person may belong in, which often lends itself to polarization (Schacter, Gilbert, Nock, & Wegner, 2017). Social categorizations can be made based on deliberate signals, such as identifying members of a religion by the symbols or iconography they wear, by more ambiguous choices, such as a person's clothing or manner of speaking, or by immutable characteristics, such as gender and ethnicity. An example of harmful stereotyping stemming from categorization is the "Jezebel" trope denoting Black women as hypersexual—a stereotype linked back to slavery (Collins, 2009). This contrasts with white women being stereotyped as pious virgins more frequently, showing the polarization which can result from stereotyping (Collins, 2009). People tend to focus heavily on either similarities or differences when categorizing, which can be seen within the concept of having in-groups and out-groups (Matlin, 2012; Tajfel & Turner, 1979). While stereotyping is not inherently harmful, it is commonly used in a way that perpetuates inaccurate, oversimplified, and/or overused characterizations of people (Schacter, Gilbert, Nock, & Wegner, 2017).

Social Categorization, Gender, and Sexual Orientation.

When it comes to both gender and sexuality, the clear delineation between "good" and "bad" created by religious groups showcases their deliberate process of policing who is and is not worthy of membership (Matthews, 2017; Morrow, 2003; Tuthill, 2016; Yeck & Anderson, 2018). Typically, fundamentalist religious groups will welcome an individual or family with open arms; however, once dependency of that individual or group on the larger religious community is established, more severe control tactics start being enforced (Matthews, 2017; Morrow, 2003; Tuthill, 2016; Yeck & Anderson, 2018). For those born into a religious community, absolute obedience to authority, such as submission of children, wives, and female members to fathers, husbands, and

religious leaders (a position restricted to women in many religions) is strongly emphasized (Matthews, 2017). This is used in tandem with a strict “us” (religious community) versus “them” (the secular world) mentality to increase likelihood of continued membership, where sexual minorities and those who challenge established gender roles are frequently placed in the “them” group (Matthews, 2017; Morrow, 2003; Tuthill, 2016; Yeck & Anderson, 2018). By having these rules, religious groups and leaders can control the narrative on who stays within the in-group and who is cast into the secular world, or out-group, which is consistent with the social categorization stage in social identity theory (Matthews, 2017; Tajfel & Turner, 1979).

Fundamentalist religious groups, such as the Catholic church, have long portrayed women as inferior to men, perpetuating the stereotype that women should be pure, pious, and subservient like the Virgin Mary while men are depicted as superior and worthy of leadership evident in the long history of Popes consisting entirely of men (see *marianismo*, Matlin, 2012; Morrow, 2003). Stereotypes used in a misleading, derogatory manner can have a negative effect, particularly when combined with the secrecy often practiced by families in fear of losing membership status (Matlin, 2012; Schacter, Gilbert, Nock, & Wegner, 2017; Yeck & Anderson, 2018). In some cases, members of a religion may be encouraged to actively stereotype and victimize others, which may cause the members of the religion and/or unaffiliated recipients of these stereotypical messages to harbor feelings of shame and guilt from internalizing these stereotypes (Matlin, 2012; McGraw et al, 2019; Shaw, 2014; Stone, 2013; Winell, 2012; Yeck & Anderson, 2018). In extreme scenarios, victims of abuse by religious leaders tragically took their own lives, at least partially due to the lack of acceptance of critiquing religious institutions as well as the stigma present around openly discussing abuse (McGraw et al., 2019). For parents of youth sexually abused by religious leaders, cognitive

dissonance emerges from the connotations of either being (1) non-heterosexual for a male youth and male religious leader or (2) promiscuous for a female youth and male religious leader can be difficult to overcome. This dissonance can impact the entire religious community, leaving silence as the natural response for those fearful of being re-labeled as part of the out-group, or secular world (McGraw et al., 2019).

Religions have often touted the normalization of women being submissive to men, which not only promotes gender inferiority, but also heteronormativity (Morrow, 2003; Weishaupt & Stensland, 1997; Yeck & Anderson, 2018). In order to recognize the insidiousness and complexity of this topic, it is imperative to understand heteronormativity. *Heteronormativity* is the normalization of heterosexual identities within a society at the expense of any non-heterosexual identities/non-binary conforming gender identities within the LGTBQIA+ spectrum. This imbalance is also reflected in research, which has disproportionately focused on heterosexuality (Fahs & McClelland, 2016; Flanders, 2016; Morrow, 2003; Tuthill, 2016; Yeck & Anderson, 2018). For example, in Tuthill’s (2016) research on how Hispanic lesbian mothers must navigate their culture’s demands in regards to religiosity/spirituality, she notes the huge gap in research pertaining to Hispanics/Latinos in the lesbian community. This gap is indicative of heterosexual people being seen as the in-group, and non-heterosexual people as the out-group. Such a disparity in psychological research means less generation of potential interventions, theories, and praxis with the objective of treating religious trauma for sexual minorities.

Social Identification

The second stage of *Social Identity Theory* is social identification, which involves the process of an individual self-identifying or self-stereotyping in a way that coincides with a group

identity to which the individual subscribes. Self-identification is similar to acculturation in which a person assimilates to a new culture, adapting their values to fit the norms of a new society, but on a smaller scale, often accompanying a previous identification rather than simply replacing it (Tajfel & Turner, 1979). However in regards to religion, when a person experiences a tension between identities, such as being a lesbian and a Christian, they can deploy several different strategies including, modifying an identity to relieve the cognitive dissonance, leaving the religious institution, or simply living with the tension (Tuthill, 2016). Thus, people can hold multiple identities simultaneously to create one larger self-identity, even if the identities are conflicting (Tuthill, 2016).

Social Identification, Gender, and Sexual Orientation

Tuthill (2016) found that Hispanic lesbian mothers created their self-identities by trying to reconcile the relationship between their sexual identity with their identity as spiritual/religious believers. Interestingly, several of the Hispanic lesbian mothers interviewed by Tuthill identified as *spiritual*, rather than *religious*, as they redefined these terms in attempts to balance conflicting self-identities and claim autonomy over their faith (2016). This distinction of terms was found to be associated with their proximity to the Catholic Church as a physical entity which the individual visited and where the individual engaged in interpersonal relationships (Tuthill, 2016). These women felt less of a right to identify as religious when only scarcely attending formal religious services, as the perception of a religious person among the majority of interviewees was an avid church-goer regardless of how often they may participate in spiritual activities outside of the physical church or institution (Tuthill, 2016). While these women's strength in adapting for improvement of their mental health is laudable, the dissonance that emerged from the anti-LGBTQIA+ doctrines of fundamentalist groups created the need to adapt in the first place. Otherwise, they would have to continuously live

with cognitive dissonance in a community telling them that their sexual identity is sinful and shameful; this is an element of religious trauma.

Corroborating Tuthill's (2016) findings, Halkitis et al.'s (2009) participants largely defined religion as an organized form of worship, or more structured, compared to spirituality. A compelling finding by Halkitis et al. (2009) showed no negative associations with the concept of spirituality although there were negative associations regarding organized religion. This was posited to show a conceptual boundary between institutionalized beliefs and spiritual beliefs to the extent of comparing them in flexibility, subjectivity, and identification of how those may attune as marginalized especially those that identify as sexual and ethnic minorities (Halkitis et al., 2009).

According to Flanders (2016), high levels of self-identification with a particular group can function as a protective measure against adverse effects on mental health; however, this is not always true for certain sexual minority groups (e.g. bisexual individuals). There are several contending factors, including heteronormative ideologies or harmful stereotypes that target certain sexual minorities and identities (Halkitis et al., 2009; Morrow, 2003; Yeck & Anderson, 2018), which are present even in some LGBTQIA+ communities that are initially deemed to be safer than mainstream society (Craney, Watson, Brownfield & Flores, 2018). Bisexual people have faced blame around the spread of the AIDS epidemic (Herek & Capitanio, 1999). In addition to being labeled as "flaky" because they "switch from side to side" by other individuals in some LGBTQIA+ communities, bisexual individuals are not seen as experiencing a legitimate sexual identity (Flanders, 2016). This application of heteronormative stigmas associated with fundamentalist religious doctrine by even other out-groups undermines the benefits of strong group-identification for the most vulnerable out-

groups (Yeck & Anderson, 2018). It also shows how the effects of stigmatization can extend beyond the initial in-group when it is a powerful enough social force (Yeck & Anderson, 2018).

In a critical analysis of the social impact of Judeo-Christian religions, Morrow (2003) describes organized religion as a social institution, a system of cultural and relational norms and behavioral expectations perhaps controlled or authorized by a doctrine. Morrow (2003) contends that the social institution of religion holds incredible amounts of influence in the United States; it is, in fact, the most powerful social institution overwhelmingly guilty of systematically oppressing sexual minorities. Oppression is evidenced by the loss of support one faces when ostracized for violating rules set forth by their subscribed religious group (McGinnis, 2015). The power of religious institutions can be seen in the ubiquitous influence of their moral guidelines within private and public governing institutions (Morrow, 2003) such as bans on same-sex marriage and other denials of legal rights to same-sex couples, sodomy laws, gay conversion therapy, and the failure of civil rights legislation to cover sexual minorities. The social influence of religion can be seen through the depersonalization that occurs when an individual alters their previous beliefs in order to conform to the subscribed groups' beliefs. In other words, they begin transitioning from maintaining an individualistic, subjective self-identity to a more collectivist, group-prototypical identity (Flanders, 2016).

Religious trauma is similar to the effects of cults, which are religious groups that impose a set of rules or doctrines that often require the stripping of one's identity for the greater cause of the group or religious leader (Levin & Ortiz, 2018; Shaw, 2014; Winell, 2012). Not all fundamentalist religions are classified as cults, however, definitions of this tend to be subjective, and again, research on the effects of cults is more prevalent than religious trauma more broadly. A common theme in response to experiencing

religious trauma is a severe distrust of institutions (Matthews, 2017). This suggests religious trauma inflicted by cults and other fundamentalist religious groups is not necessarily different in the level or type of trauma imposed from mainstream religious groups, but rather that the lack of research fails to give the full scope of the problem needed to make an accurate assessment.

Respondents in other studies went as far to say that while being members of religious groups, they felt brainwashed and coerced to relinquish both social and economic control over their lives to their former religious institution (Halkitis et al., 2009), while first-generation survivors of cults in another study reported feeling "spiritually raped" (Matthews & Salazar, 2014, pg. 190). Matthews' (2017) respondents reported feeling as though they possessed two identities: one sanctioned and taught by the cult, and the other a secret identity kept inside, rarely shared with others. Matthews and Salazar (2014) reported similar findings of individuals who had been born into a cult also saying they felt like they had two identities. Both those born within a cult (second-generation) and those who joined the cult later in their lives (first-generation) felt torn between these two identities and experienced a loss of self-identity when leaving their former cult communities (Matthews and Salazar, 2014; Matthews, 2017). Both first-generation and second-generation cult members described this loss as feeling "childlike" in their confusion of entering (or re-entering) the secular world after either stripping their sense of self to assimilate to the cult's scripts or developing their self-identity within the cult since birth (Matthews and Salazar, 2014; Matthews, 2017). The feelings of being torn between identities, loss of self-identity, and difficulty integrating into the secular world reflect the challenges faced by gender and sexual identities targeted by religious trauma (Matthews and Salazar, 2014). This experience may be amplified for female survivors of cults, most of which are patriarchal in nature

(Matthews and Salazar, 2014).

Throughout this section, it is evident that the process of self-identification is complex. The way one responds to a particular facet of another's self-identity could have a negative impact, a positive impact, or a combination thereof— a complexity which may be exacerbated within a religious context (Flanders, 2016; Halkitis et al., 2009). The unfortunate designation of blame to one group by another described in the previous paragraphs segues into the next stage: social comparison.

Social Comparison

The third and final component of *Social Identity Theory* is social comparison (Tajfel & Turner, 1979). Once an individual has aligned their self-identity with that of a religious group's identity, comparison to other groups typically begins as a way of assigning self-value to both the individual members as well as the group's identity (Tajfel & Turner, 1979). The constant fighting over moral high ground often seen between different religious groups is an example of group comparison meant to bolster one's self-esteem. This component is key to understanding how prejudice develops and remains between groups (Tajfel & Turner, 1979).

Social Comparison, Gender, and Sexual Orientation

It is critical to take power dynamics into account when examining people's identities in relation to institutional power and influence (Collins, 2009). Collins (2009) discusses the concepts of power relationships and binary thinking as tools to maintain the White supremacist and capitalist, heteropatriarchy—a framework common among fundamentalist religious group ideologies (Yeck & Anderson, 2018). But in order to possess and maintain the power to oppress, control is paramount (Collins, 2009; Matthews & Salazar, 2014; Matthews, 2017; Weishaupt & Stensland, 1997). A general aspect of control many religious institutions hold is power over the narrative of what is considered morally right or wrong

(Morrow, 2003).

Many traditional or fundamentalist religious groups are patriarchal in their structure. Thus, a “deviation” could be the act of a woman attempting to speak from the pulpit or instruct a Baptized male member in his spiritual life (Matthews, 2017; Weishaupt & Stensland, 1997). While these “deviations” may not have resulted in excommunication or disfellowshipment, male members were encouraged to verbally abuse women who were not submitting to their husbands and obeying religious leaders' demands in some cases (Matthews, 2017). These binaries are representative of the in-group/out-group concept present in the social categorization component of SIT (Collins, 2009; Tajfel & Turner, 1979). However, the act of labeling and treating people in the in-group as superior and people in the out-group as inferior is the social comparison aspect (Collins, 2009; Tajfel & Turner, 1979).

Such prohibitions clearly derive from prejudiced viewpoints that portray women as inferior to men (the sexist patriarchy) and non-heterosexual people inferior to heterosexual people (heterosexism/heteronormativity), both of which are used as a way of controlling members' lives (Matthews, 2017). But these prejudices are not arbitrary; they actually play a foundational role, providing the self-esteem boost associated with being morally superior to other groups and any non-members (Tajfel & Turner, 1979). For example, Yeck and Anderson (2018) point out that the privilege associated with heterosexuality tends to benefit said group's popularity and status as the in-group, giving incentive to increase sexual prejudice in order to maintain leverage in the religious institutional hierarchy. Some high-control religious groups demarcate ideologies other than theirs, including educational and social institutions unaffiliated with religion, as sheer evil, designating them as out-groups (Matthews, 2017; Yeck & Anderson, 2018).

Control within Religious Groups and Cults

Respondents in Matthews' (2017) study reported their religious group instructed them not to attend college, as it would be a negative influence distracting them from their church and family. This was particularly true for women members (Matthews, 2017). In fact, one woman reported being told she would not be permitted to pursue a career as having kids should be her sole duty (Matthews, 2017).

A common tactic for controlling members of cults and restrictive religious groups is the use of excommunication or disfellowshipping for any deviation from the religious institutions' doctrines (McGinnis, 2015; Weishaupt & Stensland, 1997). Such ostracization can have devastating consequences ranging from depressive disorders to mortality (McGinnis, 2015). Another common control tactic is isolation from the outside, or secular world (Matthews, 2017). This manifested in several ways: preventing personal relationships and general support from outside of their religious group, a lack of understanding of how the outside world functions both logistically and socially, as well as financial dependence within the religious group (Matthews, 2017). These control tactics make it extremely difficult to leave and when people do leave, it sometimes leads to death (Matthews, 2017; McGinnis, 2015). The ability of religious institutions to exert control and isolate members from outside resources is aided in the United States by religious-exemption legislation, which can put already marginalized people further at risk by removing legal protections and rights (Grey, 2014).

Discussion

Binary thinking, and a clear sense of inferiority/superiority relationship among some binaries, is a consistent pattern in a heteronormative patriarchy where concepts like gender and sexuality are forced into dichotomies: man/woman, male/female, straight/gay, etc. (Collins, 2009). This type of binary thinking is

codified by many religious doctrines, and can further be seen in the lack of research on religion as a source of harm compared to the abundance of research on religion as a source of healing, where religion is placed squarely on one side of the healing/traumatic dichotomy (Collins, 2009; Stone, 2013). Even when discussing clear cases of trauma, such as the sexual abuse of minors by religious leaders, the majority of existing psychological research focusing on religion as a source of harm avoids specifically using the term, *religious trauma*, to refer to institutional trauma stemming from religion (Levin & Ortiz, 2018; McGraw et al., 2019; Stone, 2013).

Social Identity Theory (SIT) provides a framework to break out of this binary thinking and address the trauma it can cause to marginalized identities (Flanders, 2016; Tajfel & Turner, 1979; Yeck & Anderson, 2018). SIT demonstrates how in-groups and out-groups are formed and how religious institutions use the power of group pressure to exert control over members. This control becomes more powerful when the institution is able to isolate members from out-groups, thereby enhancing members' reliance on the in-group (Flanders, 2016; Tajfel & Turner, 1979; Yeck & Anderson, 2018).

SIT consists of three stages, each of which can help identify institutional sources of trauma and create healthy alternatives for the many individuals affected (Matthews, 2017; Tajfel & Turner, 1979). Social categorization highlights the process used to classify others as a part of one or several unique groups (Tajfel & Turner, 1979), and can encourage exploration of self-identity with greater complexity to accommodate individuals who do not fit within simplistic binary classifications (Collins, 2009; Flanders, 2016). Social identification shows how institutions use these social categorizations to form in-groups that reinforce core beliefs and values (Tajfel & Turner, 1979). For those recovering from religious trauma, social identification can provide avenues to connect with other marginalized identities and replace

social connections that are lost when leaving or being forced out of a religion; although this has been found to be more true for certain marginalized identities than others (Flanders, 2016; Levin & Ortiz, 2018; Tuthill, 2016). Social comparison exposes an important tool for control where in-groups isolate members and demonize out-groups as inferior in order to discourage members from challenging institutional values (Tajfel & Turner, 1979). Understanding how institutions use this tool to leverage fear to control members allows victims of trauma to overcome that fear and integrate themselves into new groups that were considered out-groups under their religious doctrine.

In addition to social identity theory, alternative theories could be incorporated into, or alongside, this framework as potential improvements. Intersectionality theory as coined by Crenshaw (1989) should be further explored in relation to identity and religion, especially in regards to ethnicity/race which this paper did not examine although scholarship on such topics have recently begun to emerge within psychology (Clauss-Ehlers et al., 2019). The concept of negotiating one's religious and sexual identity briefly in reference to Tuthill (2016) is comparable to the power of self-definition common within Women of Color feminism scholarship but deserves much more exploration by psychology scholars (Collins, 2009). The power of redefining a label has strong potential to combat controlling images, or harmful stereotypes based on a facet (or facets) of a person's identity such as their race, gender, class, and/or sexual orientation intentionally uses an intersectional lens in its analysis as opposed to strictly psychological approaches (Collins, 2009).

Religious trauma covers a wide range of potential abuses and victims; however, further research is needed to explore the individual needs of each regarding interventions and counseling approaches as few currently exist (Levin & Ortiz, 2018; Stone, 2013). For example, a transgender Evangelical Protestant woman in the Bible Belt

may experience trauma differently from a bisexual Muslim woman in an urban center, and the most effective methods to identify and treat the needs of each might differ. More specific forms of religious trauma, such as gay conversion or reparative "therapy" (*not* therapy sanctioned by an accredited psychologists), deserve additional attention and may require their own interventions separate from religious trauma in general (Morrow, 2003). Another specific form of religious trauma warranting more attention is the exclusion of intersex individuals among religious institutions, which may present its own unique difficulties but is not specifically addressed in any of the literature reviewed.

The existing research, while sparse, provides a strong case to identify religious trauma as a persistent source of mental harm. Religion is one of the most powerful cultural institutions in the United States (as well as other countries), making it a powerful force in establishing and defining the group dynamics described by SIT. The out-groups targeted most frequently by these dynamics tend to be sexual and gender identities, leaving them particularly vulnerable to religious trauma. Acknowledging religious trauma as a specific and prevalent form of institutional harm is essential to identifying and treating its effects. Future research that expands on this foundation and studies the unique interactions of different circumstances resulting in religious trauma is necessary to design interventions best suited for individual patients.

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