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From the Editor's Desk

The fall semester is upon us and with it comes the newest edition of the Journal of Psychological Inquiry. It has been an exciting spring and summer for us at the journal. The journal continues to see a substantial number of submission and we couldn't be more pleased! With that being said, we would like to recognize the addition of 3 new Associate Editors. Specifically, the journal would like to welcome Drs. Fred Sanborn (North Carolina Wesleyan College), Chris Barlett (Gettysburg College), and Natalie Barlett (Gettysburg College) as new Special Feature Associate Editor.

Also, in this issue you will find a new call for a Special Features Section on Teaching Techniques. In this section, student and faculty mentors will collaborate regarding a teaching technique the faculty member uses that the student found particularly helpful. We encourage you to submit your work soon!

JPI also has updated our website since the last installment. The updated website can be found at www.fhsu.edu/psych/jpi. The website now contains information about submitting to JPI, archived issues of JPI, and information about the editorial board. In addition, the new website offers video tutorials for authors, which contain step-by-step guides on types of manuscripts that can be submitted, how to create author accounts, and how to submit manuscripts. Lastly, the tutorials also contain guides for those faculty members who wish to become reviewers.

As always, given this increase in submissions, we are faced with an ever increasing need for reviewers. If you are willing to serve in this role and/or know of someone who is, please contact Jenn (jmbondsraacke@fhsu.edu), John (jdraacke@fhsu.edu) or Brooke Mann (bmzoller@mail.fhsu.edu) at your earliest convenience!

Lastly, we want to give a special thank you to Brooke Mann and Monica Anderson, two students whom without their help we could not pull off this journal each issue. We appreciate all your help and everything you do!

Best regards,

Jenn Bonds-Raacke and John Raacke
Managing Editors

Acknowledgement: Reviewers

The following individuals reviewed manuscripts for this volume of the *Journal of Psychological Inquiry*. We gratefully acknowledge their valuable contributions to the journal.

Dr. Joanne Altman, High Point University

Dr. Jennifer Bonds-Raacke, Fort Hays State University

Dr. Mary Campbell, Christian Brothers University

Dr. Marc Carter, Baker University

Dr. Krista Fritson, University of Nebraska at Kearney

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Dr. Matt Hayes, Winthrop University

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Dr. Wayne Poniewaz, University of Arkansas at Monticello

Dr. Sarah Reiland, Winthrop University

Ms. Eloise Thomas, Ozarks Technical Community College

Mr. Nathan Van Wieren, Fort Hays State University

Acknowledgement: Institutions & Organizations

The following institutions and organizations contributed financially to pay for the operating expenses of the *Journal of Psychological Inquiry*. We gratefully acknowledge their valuable support of the journal.

Avila University	Newman University
Benedictine College	Northwest Missouri State University
Caldwell College	Rockhurst University
Columbia University	Union College
Doane College	University of Central Missouri
Emporia State University	University of Nebraska, Kearney
Fort Hays State University	University of Nebraska, Lincoln
Kansas State University	University of San Diego
Missouri Western State University	Webster University—St. Louis
Morningside College	Washburn University
Nebraska Wesleyan University	
Association for Psychological and Educational Research in Kansas	Nebraska Psychological Society

Cover:

Logo: The creation of the graphic for the logo came about by thinking of how ideas are formed and what the process would look like if we could see into our brains. The sphere represents the brain, and the grey matter inside consists of all the thoughts in various stages of development. And finally, the white spotlight is one idea that formed into a reality to voice. The entire logo is an example of creation in the earliest stages.

Cathy Solarana, Graphic Designer

Cover Design: The overall design was influenced by many aspects of psychology. Much of the inspiration was developed through the use of the iconic symbol for psychology as well as the beauty of psychology in its own right.

Brittney Funk, Graphic Designer

Assessing the Clinical Value of Cannabis-Based Treatments on Fibromyalgia Pain

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Abstract—This paper investigates the effectiveness of treating pain attributed to Fibromyalgia Syndrome (FMS) with cannabis-based medicine. Fibromyalgia is a debilitating condition characterized by widespread pain and related symptoms that effects 2-4% of populations worldwide (Fitzcharles & Yunus, 2012). A comprehensive explanation for the underlying causes is still developing and current pharmacology provides little symptom relief. Unlike typical manifestations of pain, fibromyalgia is not a response to pathology or physical injury, but rooted in the functioning of pain signals within the nervous system (Schmidt-Wilcke & Clauw, 2010). When case studies began reporting fibromyalgia-related symptom relief from using preparations of the Cannabis sativa plant, clinical trials were performed to investigate their validity (Lynch & Campbell, 2011). This review examines these clinical trials, along with the current understanding of fibromyalgia, the history of cannabis use and its chemicals effects on the endocannabinoid system, and how this recently discovered system relates to fibromyalgia. Drawing on the promising results of this review, the values and drawbacks of cannabis and its emerging pharmaceutical counterparts can be more accurately considered when treating fibromyalgia and other pain conditions.

Keywords: $\Delta 9$ -tetrahydrocannabinol (THC), cannabinoids, marijuana, tender points

Medical advances in the past century have lengthened and improved the lives of many. This has come most notably by the near eradication of previously prevalent diseases, diagnostic technologies able to expose ailments within the body, and transplantation procedures to replace damaged and failing organs. Despite much advancement, viable remedies for pain conditions have made little progress. Chronic pain is associated with some of the worst quality of life indicators compared with other diseases and few pharmaceutical treatments are safe and effective for long-term use (Lynch & Campbell, 2011). A variety of cannabis-based treatments are now being tested in the hopes of offering more alternatives for sufferers of chronic pain conditions, including fibromyalgia.

Fibromyalgia Syndrome

Although unpleasant, acute pain is an advantageous sensation, drawing attention towards harmful stimuli while promoting avoidance for the future. However, when prolonged and unprovoked,

pain can severely decrease a person's quality of life and limit daily activities (Bonica & Fishman, 2010). Fibromyalgia is a condition characterized by chronic, widespread pain remaining largely unfazed by conventional pain medications (Nishiyori et al., 2011). Although sufferers complain of persistent joint and tissue discomfort, the problem lies in a dysregulation of the body's pain processing. Similar disorders have been described in medical literature for centuries, but it wasn't until 1981 that the first criteria for diagnosis were set. These required aches and pains at numerous tender points (areas of soft tissue, normally around joints, with reduced pain tolerance without tissue pathology). A diagnosis also needed three of the following ten symptoms: decreased physical activity because of symptoms, weather-related symptom aggravation, stress/anxiety-related symptom aggravation, sleep disturbances, fatigue/tiredness, anxiety, headaches, irritable bowel syndrome, swelling, and/or numbness in limbs (Yunus, Masi, & Calabro, 1981). Disturbances in mood, memory, and cognitive

functioning often accompany physical symptoms (Fitzcharles & Yunus, 2012).

The American Medical Association (AMA) recognized fibromyalgia in 1987, followed by the World Health Organization (WHO) in 1993. In its early years, the legitimacy of fibromyalgia was met with skepticism due to the lack of apparent physical cause or objective test validating complaints. This led some to believe that symptoms were “in the patient’s head” and a masked form of hypochondria or depression (Fitzcharles & Yunus, 2012). Extensive research involving physiological testing and imaging has since shown these impressions to be untrue and gave reason to believe these patients are in a great deal of discomfort.

Altered pain experiences are hallmarks of fibromyalgia and evidence of a sensory processing dysfunction. Years of research have indicated that individuals with fibromyalgia consistently complain of increased pain to normally painful stimuli, as well as pain to normally nonpainful stimuli (Schmidt-Wilcke & Clauw, 2010). Functional magnetic resonance imaging (fMRI) studies have found measurable differences in the pain processing areas of the brain in patients with fibromyalgia. In these studies, important structures such as the rostral anterior cingulate cortex were activated more often, to a greater degree, and sometimes without a physical stimulus in those with fibromyalgia. This indicated symptoms relate to a neurobiological amplification of pain signals (Gracely, Petzke, Wolf, & Clauw, 2002).

There are an estimated five million Americans diagnosed with fibromyalgia and most become symptomatic in their forties or older (Arnold et al., 2004). More than 95% of those diagnosed are female and nearly 40% report the onset of symptoms being preceded by a psychological or physical triggering event (Fitzcharles & Yunus, 2012). Onset is generally gradual and symptoms often fluctuate over time. This variability makes a definitive diagnosis difficult and leads many sufferers to be perceived as chronic complainers (Elrod, 2002).

The current model for treatment is focused on symptom management (Fitzcharles & Yunus, 2012). Many health professionals advocate multifaceted programs emphasizing education, exercise, cognitive behavioral therapy, and symptom-based pharmacology treatments. Pregabalin (Lyrica®)

became the first FDA approved drug for treating FMS in 2007, and the antidepressant Duloxetine (Cymbalta®) followed in 2008. There is evidence that Pregabalin may improve pain and help with sleep problems, but not for everyone, and the mechanism for this is not understood (Schmidt-Wilcke & Clauw, 2010). Antidepressants and opioids are the most frequently prescribed pharmaceuticals for fibromyalgia. Antidepressants have been shown to improve mood, sleep, and pain severity, but relief is not seen in all users and can worsen symptoms in some cases. One study found antidepressants to be effective for treating pain, fatigue, and insomnia associated with fibromyalgia in only 25% of patients and researchers were unsure how long beneficial results would last (O’Malley et al., 2000). Opioids and other painkillers have demonstrated even lower success rates and many severe drawbacks (Fitzcharles, Ste-Marie, Gamsa, Ware, & Shir, 2011).

There is no evidence demonstrating painkillers have any benefits for treating fibromyalgia and can worsen depression, constipation, and even pain in some patients (Fitzcharles et al., 2011). According to a 2004 review of fibromyalgia treatments, “opioids should be considered only after all other medicinal and nonmedicinal therapies have been exhausted” (Goldenberg, Burckhardt, & Croford, 2004, p. 2391). Despite the lack of clinical effectiveness and high risk of abuse, doctors have few options and nearly a third of fibromyalgia patients have been prescribed opioids from a medical professional for their symptoms (Fitzcharles et al., 2011). Because of the desperation caused by chronic symptoms often remaining after medical intervention, many sufferers have experimented with alternative therapies, including cannabis.

History of Cannabis

Cannabis, commonly known as marijuana, is the most popular illicit drug in most countries (National Institute of Drug Abuse, 2010). A recent survey found 48% of U.S. citizens have smoked or otherwise ingested cannabis in their lifetime and around 12% had in the past year (Pew Research Center, 2013). The plant is commonly used recreationally for its mind-altering effects, but has also been used for relieving stress, anxiety, and for treating various medical ailments (Adams & Mar-

tin, 1996).

The earliest known use of cannabis was in Asia over 6,000 years ago and it has since been used as a food, industrial fiber, religious sacrament, medicine, and recreational purposes in nearly every part of the world. It was listed in the oldest pharmacopoeia of first-century China, where it was described to reduce symptoms of rheumatic pains, intestinal constipation, disorders of the female reproductive system, malaria, amongst others. During the 19th century, doctors in America and Europe were excited about the plant's potential as an antispasmodic, analgesic, and sedative. Hundreds of studies were published during this time regarding its effects on different conditions (Zuardi, 2006).

In the early 20th century, the popularity of cannabis declined for a variety of reasons. Vaccines and analgesics, such as aspirin, were becoming widely available, and prompted a shift from herbal to pharmaceutical medicine (Zuardi, 2006). The conservative nature of this era also raised suspicion towards the plant's mind-altering effects. In an attempt to convert popular opinion, it was given the nickname 'marijuana' from opponents associating its use with Mexican immigrants and their illegal activities (Marez, 2004). These factors would all play a part in the antagonism and eventual prohibition of cannabis.

Congress passed the Marijuana Tax Act in 1937, effectively banning cannabis by making it expensive and difficult to obtain (Adams & Martin, 1996). It was consequently removed from the American pharmacopoeia in 1941 and continuously marginalized, culminating in the Controlled Substance Act in 1970 (Bostwick, 2012). Although remaining illegal seventy years later, the popularity and acceptance of cannabis is at an all time high. Seventy-seven percent of Americans now believe it has legitimate medical value and more than half favor legalization for both medicinal and recreational purposes. This support has dramatically increased since first being polled in 1969, when support was 12% (Pew Research Center, 2013).

Health and Effects of Cannabis Use

The myriad of effects from ingesting cannabis stems from the plant's unique chemical components, termed cannabinoids (Adams & Martin,

1996). The highest concentrations of cannabinoids are found in the sticky resin covering the plant's leaves and flowering buds (Hall, Louisa, & Michael, 2001). These plant parts are commonly dried, broken up, and smoked in pipes or rolled into paper cigarettes (National Institute of Drug Abuse, 2010). Noticeable effects begin shortly after inhalation and generally last less than one hour (Hall et al., 2001). Physiological changes include increased heart rate, reddening of the eyes, and loss of moisture in the mouth and mucous membranes (Kalant, 2004). Common psychological effects, collectively known as the "high," include changes in sensory and time perception, increases in euphoria and laughter, a heightened sense of spirituality, as well as temporary reductions in focus and cognition (Adams & Martin, 1996). Psychomotor functions, such as reaction time and motor coordination, are noticeably impaired while under the influence (Hall et al., 2001).

Aside from smoking, other means of ingestion include vaporization and eating foods prepared with cannabis oil (Hall et al., 2001). Vaporization is a new and medicinally advantageous way of heating plant material to temperatures that release cannabinoids without burning them, where they can be trapped and inhaled. This drastically reduces the amount of carcinogens ingested from smoking while still delivering the rapid effects of inhalation (Gieringer, St. Laurent, & Goodrich, 2004). Alternatively, users may eat foods and baked goods prepared with oil containing cannabis extracts. Rather than travelling directly into the blood stream via the respiratory system, oral ingestion leads to a much slower metabolism through the stomach and liver. This causes psychoactive effects to take much longer to occur, effects are heightened and prolonged, and dosing levels are more difficult to regulate (Adams & Martin, 1996).

Although cannabis is nonlethal, benefits should be properly weighed against potential drawbacks. Short term effects on blood pressure and heart rate are unlikely to harm healthy individuals, but may be less benign in patients with preexisting heart conditions, such as congestive heart failure and coronary artery disease (Hall et al., 2001). Frequently smoking plant matter can also cause long-term reductions in pulmonary function

(Kalant, 2004). A minority of users report unwanted psychological incidents after consuming cannabis, such as paranoia and anxiety (Johns, 2001).

Some heavy users have indicated frequent consumption led to antisocial feelings after use, physical neglect, feeling depressed for more than a week, poorer than usual general health, pains in the chest and lungs after smoking, and memory loss (Copeland, Swift, & Rees, 2001). Although some suffer minimal cognitive impairments from long-term use, individuals with learning disabilities are especially susceptible to disruptions in memory and declines in educational performance. This is particularly concerning for minors whose brains are still in crucial stages of development. Despite exhaustive prohibitive measures, a 2010 survey found over one-third of all twelfth graders used cannabis at least once in the past year (National Institute of Drug Abuse, 2010).

There are also concerns of increasing rates of cannabis dependence and rising concentrations of the most psychoactive component, Δ^9 -tetrahydrocannabinol, or THC (Adams & Martin, 1996). Average THC concentrations have risen from 1.5% in the late 1960s to upwards of 20% due to selective use of seeds, indoor cultivation, and other growing techniques (Sevigny, 2013). The number of people meeting criteria for cannabis dependence is also on the rise and may be related to the ever-increasing potency (Han, Gfroerer, & Colliver, 2010). Heavy use can produce increases in tolerance and some have reported problems controlling their use, continuing despite adverse personal consequences, or withdrawal symptoms after ending use (Hall et al., 2001). Additionally, 3-8% of current marijuana users report it has caused problems at school, work, or home, strained interpersonal relationships, or caused a reduction in social, occupational, or recreational activities (Han et al., 2010).

High rates of abuse are well documented among mentally ill populations compared to age-matched healthy controls. One hypothesis alleges cannabis use may bring about an early onset of symptoms in those with a predisposition to psychosis (Le Bec, Fatséas, Denis, Lavie, & Auriacombe, 2009). Others see using cannabis as a self-medicating behavior, which may relieve distress related to mental illnesses (Kalant, 2004).

The literature has shown that while THC plays a role in producing acute psychotic symptoms, another prevalent cannabinoid named cannabidiol, is a well-tolerated treatment for schizophrenia (Bhattacharyya et al., 2010). This demonstrates the complicated relationship between cannabinoids and their effects on differing systems.

Endocannabinoid System

Cannabinol and cannabidiol were the first cannabinoids discovered in the 1940s and the well-known chemical THC was discovered in 1964 (Mechoulam & Gaoni, 1964). Over 400 compounds have since been found in the plant and 66 of them are classified as cannabinoids (Adams & Martin, 1996). The unique effects of these chemicals were found to be caused by their actions on two receptors, discovered by radioactively labeling THC and tracing its dispersion throughout the body using positron emission tomography (PET) scans (Devane, Dysarz, & Johnson, 1988). These G-protein-coupled receptors were named cannabinoid (CB) receptors after the THC ligands in cannabis that led to their discovery (McPartland, Matias, & Glass, 2006).

CB₁ receptors are localized in the central nervous system while CB₂ receptors are concentrated in tissues involving the immune system such as the spleen, tonsils, and thymus (Zimmer, Zimmer, Hohmann, Herkenham, & Bonner, 1999). After cannabinoids are ingested, they enter the blood stream through the pulmonary or digestive system and circulate throughout the body. Cannabinoids may then ligate to CB₂ receptors, be deposited in fatty tissues, or cross the blood-brain barrier and activate CB₁ receptors. Accompanying psychological effects originate from cascading changes in neurotransmitter levels after widespread CB receptor activation in the brain (Adams & Martin, 1996).

Areas with the highest concentrations of CB₁ receptors include the cerebral cortex, hippocampus, hypothalamus, amygdala, cerebellum, and basal ganglia (Adams & Martin, 1996; Chait & Perry, 1994). Cellular changes within the cerebral cortex following ingestion are the source of perceived psychoactive effects, while effects on memory and cognition are consistent with localization in the hippocampus, an area important for sensory information and memory retention (Adams & Martin,

1996). The hypothalamus is responsible for enhancements in appetite, and the amygdala is involved with altered emotional responses (Bhattacharyya et al., 2010). Receptor activation in the cerebellum and basal ganglia, important structures for motor movements, may cause solemnness and lethargy. Low levels in areas responsible for autonomic processes, such as breathing, are consistent with why cannabis is nonlethal (Adams & Martin, 1996; Chait & Perry, 1994; Herkenham et al., 1990).

The discovery of cannabinoid receptors and their prevalence throughout the body raised speculation of a previously unknown neurochemical system (Adams & Martin, 1996). Isolation of the chemicals Anandamide (AEA) and 2-arachidonoylglycerol (2-AG) provided initial evidence for this hypothesis. AEA and 2-AG were found to compete with CB receptor binding and produced pharmacological effects similar to THC, such as increased tolerance to pain, reduced sensation to external stimuli, and decreased motor movements (Fride & Mechoulam, 1993). These signaling molecules (AEA and 2-AG) are cannabis-like chemicals produced in the body that endogenously activate CB receptors. They were subsequently named endocannabinoids because of their functional similarities to the cannabinoids that led to their discovery (Guindon & Hohmann, 2009).

Both endocannabinoids and cannabinoids ligate to CB receptors and cause similar changes at the cellular level (McPartland et al., 2006). The major difference is that exogenous molecules, such as THC, show a higher affinity for these receptors and are present in higher concentrations after cannabis is ingested (Janero, Vadivel, & Makriyannis, 2009). Therefore, molecules from cannabis have a 4-20 times higher potency, longer duration of action, and heightened psychological effects (Felder et al., 1998). From the discoveries of cannabinoid receptors, endogenous ligands, enzymes, and accompanying lipid chemicals, the endocannabinoid system (ECS) has been recognized as one of the most extensive receptor systems in animals and humans. Although the medical significance of the ECS is not fully known, some researchers hypothesize that an endocannabinoid deficiency plays a role in the pathology underlying migraines, irritable bowel syndrome, and fibromyalgia (Russo, 2004).

One of the primary roles of the ECS is thought to be involved with regulating neurotransmitter activity in the central nervous system (CNS). When post-synaptic neurons are depolarized, endocannabinoids are produced and bind with CB₁ receptors. Activation of these receptors are linked to the closing of voltage-gated calcium channels, which impedes further release of neurotransmitters, stimulates neurons after excitation, and prevents hyperexcitability (Basavarajappa, 2007). The effects of CB agonists on neuromodulation, neuroprotection, and neurotransmitter release have made them a major interest for pharmaceutical replication (Guindon & Hohmann, 2009).

Due to the relatively short-lived effects and the accompanying psychoactive properties, many believe future medical applications of cannabinoids lie in pharmaceutical concoctions aiming to control for desired effects. Several synthetic compounds have already become available for various ailments and include dronabinol (Marinol®), nabilone (Cesamet®), and a mixture of plant-based THC and cannabidiol called Sativex® (Seely, Prather, James, & Moran, 2011). Sativex is a sublingual spray prescribed for relieving cancer-related pain, as well as neuropathic pain and spasticity from multiple sclerosis (National Institute of Drug Abuse, 2010). Potential advantages of pharmaceutical cannabinoids over plant-based concoctions are that potency, consistency, and medicinal qualities may be more precisely controlled (Seely et al., 2011).

Clinical Trials

There have been a number of recent clinical trials testing cannabis treatments on patients suffering from chronic pain. The objective of a 2008 study was to determine how orally administered THC influenced quality of life factors for sufferers of various conditions. Participants included 13 nonmalignant pain patients who had been unresponsive to conventional pharmacotherapy. Three of them were previously diagnosed with fibromyalgia and two reported THC to be more effective than any treatment previously prescribed. Overall, eight of the 13 participants exhibited positive outcomes. The Health Related Quality of Life (HRQoL) scale showed significant improvements for most individuals in performing daily and social activities, deal-

ing with pain, intensity of pain, use of analgesics, quality of sleep, overall mood, and appetite (Haroutiunian, Rosen, Shouval, & Davidson, 2008).

A similar study, composed exclusively of fibromyalgia patients, divided participants into groups of cannabis users ($n=28$) and a control of non-users ($n=28$). Routes of administration included smoking, oral ingestion, and a combination of the two. To determine the effects cannabis had on symptoms, multiple questionnaires were administered two hours after consumption. Questionnaires included the Visual Analogue Scale for Pain, Fibromyalgia Impact Questionnaire, Pittsburgh Sleep Quality Index, and SF-36 Health Survey. Participants given cannabis reported significant reductions in pain and stiffness, enhanced relaxation, and increased somnolence and well-being compared to the control group (Fiz, Durán, Capellà, Carbonell, & Farré, 2011). Lynch and Campbell (2011) published an extensive review of randomized controlled trials (RCT) that used cannabis-based treatments on patients diagnosed with fibromyalgia, rheumatoid arthritis, and chronic non-cancer pain. Included were trials comparing cannabinoid agents with placebos or active control groups with the primary outcome of pain alleviation. Eighteen studies published between 2003 and 2010, with a total of 766 participants, met the authors' inclusion criteria. Fifteen of these demonstrated a significant pain-relieving effect from the cannabinoid agent being used and several showed significant improvements in quality of sleep. Four of these trials had administered cannabis cigarettes to neuropathic pain patients and all four resulted in symptom relief without serious side effects. Another four studies used the synthetic agonist nabilone, three of which found a significant analgesic effect when tested against a placebo for spasticity-related pain, spinal pain, and fibromyalgia (Lynch & Campbell, 2011). Lynch and Campbell concluded,

Given that this systematic review has identified 18 RCTs demonstrating a modest analgesic effect of cannabinoids in chronic pain that are safe, it is reasonable to consider cannabinoids as a treatment option in the management of chronic neuropathic pain with evidence of efficacy in other types of chronic pain such as fibromyalgia and rheu-

matoid arthritis. (2011, p. 742)

Discussion

The first step towards improving the treatment of fibromyalgia was standardizing its diagnosis criteria in the early eighties. After mostly overcoming initial skepticism, challenges now lie in identifying remedies to improve sufferers' pain and overall quality of life. Until the mechanisms underlying fibromyalgia are better understood, treatments will continue to be focused on symptom management. In recent clinical trials, synthetic and plant-based cannabinoids have shown positive results in deafening pain and related symptoms. A potential endocannabinoid deficiency and its relation to the onset of fibromyalgia need further research and consideration (Fiz et al., 2011).

Much like fibromyalgia, cannabis has come a long way in its medical acceptance. With the knowledge attained in the past fifty years, it is logical to conclude cannabis is neither exceedingly toxic nor entirely harmless, but undeniably has medical value including pain relief (Lynch & Campbell, 2011). This places it in the realm of other pharmaceuticals, and indicates a reassessment of its place in law and medicine is needed. Cannabis is still legally unavailable because of its classification under the Controlled Substance Act as a schedule I drug; implying it is dangerous and has no medical value (Bostwick, 2012). This stance ignores current scientific evidence, prohibits its use for treating conditions it has shown to benefit, and continues to obstruct its accessibility for further research.

Since 1996, twenty states and the District of Columbia have enacted policies conflicting with the federal government's position that cannabis lacks medicinal benefits (Office of National Drug Control Policy). Medical professionals in these states are able to prescribe cannabis for chronic pain, nausea induced by radiotherapy and chemotherapy, glaucoma, and wasting syndrome from AIDS (Basavarajappa, 2007). Voters in Washington and Colorado took this further in 2012 by passing initiatives that made small amounts of cannabis legal for both medicinal and recreational use (Pew Research Center, 2013). As cannabis becomes more prevalent and criminalization relaxes, it is vital to provide empirically based policies accounting for medicinal benefits and drawbacks, while minimiz-

ing abuses by mentally ill and adolescent populations.

Undoubtedly, more research on treating fibromyalgia with cannabis is required, and larger sample sizes are warranted to generalize early findings. Furthermore, trials examining treatments and ingestion methods against one another rather than a placebo may illustrate the most effective means for application. Cannabis should not be considered a cure-all, nor would it be suitable for all chronic pain sufferers. Individuals susceptible to pulmonary, cardiac, or psychiatric conditions should be cautious when considering cannabis (Hall et al., 2001). Nevertheless, there is tremendous demand for viable options in managing the persistent and adaptive symptoms of fibromyalgia. Evidence suggests incorporating cannabinoids into an approach including behavioral/lifestyle adaptations and cognitive behavioral therapies may optimize overall benefits for many sufferers. One thing is for certain: fibromyalgia and cannabis will continue to challenge the way pain is understood and treated.

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Evaluation of Fission-Fusion in Spider Monkeys at the Little Rock Zoo

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Abstract—Highly social, spider monkeys illustrate a group dynamic known as fission-fusion in natural settings. The fission-fusion model states that group members are rarely together at the same time, but instead form small subgroups in which membership regularly changes. This model has been proximately explained as a function of food abundance, defense of group resources, and sex segregation (Hartwell, 2010). The purpose of this study is to document the occurrence of fission-fusion in a captive setting. Using observational methodology, frequency and size of subgroup pairings were aggregated to evaluate the dynamic across a span of 3 months, contributing to the sparse literature on fission-fusion in captive spider monkeys. The nature of this captive setting eliminates the need for more standard proximate functions of fission-fusion. The need to incorporate alternative explanations for the dynamic is discussed.

Keywords: Fission-fusion model, spider monkeys, captive setting, group dynamics

The fission-fusion model has provided an operational definition for social organizational structure within many species of animals. The fission-fusion model states individuals belonging to an established community are rarely all together (fusion events), but rather form small subgroups (fission events) that change regularly (Chapman, 1990; Fedigan & Baxter, 1984; McFarland-Symington, 1990). For example, a group of animals may all sleep in a shared territory but will break off into smaller groups to forage. Many species display the fission-fusion dynamic, including spotted hyenas (*Crocuta crocuta*: Kruuk, 1972), bottlenose dolphins (*Tursiops truncatus*: Connor, Wells, Mann, & Read, 2000; Foley, McGrath, Berrow, & Gerritsen, 2010), African elephants (*Loxodonta africana*: Wittemyer, Douglas-Hamilton, & Getz, 2005), spider monkeys (*Ateles* spp.: van Roosmalen & Klein, 1987), chimpanzees (*Pan troglodytes*) and bonobos (*Pan paniscus*: Nishida & Hiraiwa-Hasegawa, 1987). Contrasting environments and ecological niches predict different evolutionary reasons for the fission-fusion model, posing questions about the consistency of its function. And although the ultimate explanations of its function are useful, the proximate explanations and

mechanisms have degrees of variability. In addition, incredible environmental variation poses particular methodological difficulty in defining and analyzing the flexible nature of group membership within the fission-fusion model (Chapman, White, & Wrangham, 1993).

Regarding both fission and fusion groupings, competition over resources and predation risk are the most cited determinant influences on group and subgroup size (Alexander, 1974; Bradbury & Vehrencamp, 1976; Decanini & Macedo, 2008; Pulliam & Caraco, 1984). In some primates, defense of group resources (Wrangham, 1980), sex segregation (Hartwell, 2010; Sakamaki, 2009) and protection from foreign male attacks (Wrangham, 1979) have also been cited as determinants for group size. Although Chapman, Wrangham, and Chapman (1995) found food abundance as being a major determinant among fusion events, *only half* of the subgroup size pairings were determined by habitat-wide measures of food abundance. Similarly, Anderson, Nordheim, Boesch, and Moermond (2002) found that in chimpanzees, party size did not increase with food abundance. These conflicting explanations suggest food abundance alone is not a sufficient explanation for fission-fusion in pri-

mates, especially if a species lives where food resources are abundant and have little to no variation, such in a zoo setting.

The fission-fusion dynamic has been consistently seen in spider monkeys in natural settings (see Chapman et al., 1993; Ramos-Fernández, 2005; Symington, 1988; van Roosmalen & Klein, 1987). The few studies examining fission-fusion in captive settings (see Schaffner & Aureli, 2005) suggest spider monkeys also display the social dynamic, even without the limited food that comes from a more natural-type setting. Because of this, some researchers have questioned food allocation as a primary determinant for fission-fusion. Schaffner and Aureli (2005) conducted a study in which social grooming and embraces were tracked as a primary proximate expression of fusion events in a captive spider monkey population. Analyses showed frequency of embraces was positively correlated with the number of fusion events per observation, although the frequency of grooming was not. Another study of captive spider monkeys showed the rate of exchanged embraces was positively associated with the rate of co-feeding or eating together (Pastor-Nieto, 2001). In addition, acts of grooming were exchanged at higher rates in a well-established captive group of spider monkeys, which included several closely related individuals; the group appears to share food in exchange for grooming. This is of particular interest because the component of food amount was not considered as an aspect of the dynamic. It appears the fission-fusion dynamic remains despite the sparse or regular allocation of food resources.

Further exploration is needed in captive settings to better understand proximate causes of fission-fusion. In the current study, we investigated the illustration of the fission-fusion model in a troop of spider monkeys at the Little Rock Zoo by evaluating the frequency and size of pairings among individuals (as used in Schaffner & Aureli, 2005). In addition, we tracked who paired with whom to assess for individual preferences. Some studies showcase inconsistency among troop member pairings (Chapman, 1990; Fedigan & Baxter, 1984; McFarland-Symington, 1990) and we evaluate this preference as an approximation of within group consistency.

Since captive monkeys are never in danger

of being preyed upon in a zoo environment, considerations regarding predation can be eliminated. In addition, this particular troop has no intact male so opportunities to mate are also controlled as a cause for social pairings. Unfortunately, these controls also limit our external generalizability to wild-type monkeys. The purpose of this research is to establish the presence of fission-fusion in captive spider monkeys and to contribute to the literature on this topic. We also hope to open the conversation of alternative proximate explanations for the fission-fusion social dynamic since this captive location eliminates variables associated with competition for food, mating opportunities, or defense of resources. We hypothesize this group will socialize similarly to wild populations and illustrate the fission-fusion dynamic in the frequency of size of their pairings and in the lack of preferences within those pairings.

Method

Participants

Two adult male and seven adult female black-handed spider monkeys at the Little Rock Zoo (LRZ) in Little Rock, AR served as subjects for this observational study. The troop of monkeys consists of Angora, Fuzzy, Merida, Linda, Mitu, Gloves, Astera, Terra, and Mir. With help from zookeepers, we photographed and identified individuals, learning to recognize the subtle physical and behavioral differences between them. Angora, smallest next to Linda, daughter of Fuzzy, is more vocal than any other monkey in the population. Fuzzy is lightly colored, short, and squatty. She has an abnormally large midsection due to a liver condition. Merida is recognizable due to her darker coloring. She is a full biological sister to Angora, who is also the offspring of Fuzzy and Charlie (deceased). Gloves also has dark coloring and is larger than many of the females. Linda is the oldest, skinniest, and smallest female. Linda has a documented mental condition similar to Alzheimer's in humans. At one point, she had cancer, which resulted in the removal of her ovaries. She was raised by humans and is the only monkey biologically unrelated to the rest of the group. Astra is the daughter of Terra and granddaughter of Gloves. Terra is Glove's daughter, lightly colored, and overweight. Mitu is the son of Gloves and Charlie; Mitu is considered the domi-

nant male. Mir is a castrated male with a lame tail, which was partially amputated when he was an adolescent. Chapman and Chapman (1987) claim aggression against immature males is common, showing four young monkeys also lost their tails as a part of troop aggression. Mir is the son of Liberty and Charlie (see Figure 1 for family tree). Eight of the monkeys were born in captivity in a zoo environment and were eventually directed to the Little Rock Zoo. Linda is the only monkey raised outside of a zoo environment, living as a pet until her arrival at the Little Rock Zoo.

Materials

The monkeys are housed in an inside-outside enclosure, built in 1967, surrounded by a water barrier. What looks like a large rock is actually a hollowed plastic holding area housing three large cages, used at night. The total measurement around the rock (perimeter) is 152 ft. The width from side to side over the rock is 32 ft, and the length from end to end over the rock is 87 ft. The grassy section of the island is (north to south) 50 ft 7 in, (east to west) 74 ft 6 in, with a perimeter of

240 ft 3 in. The exterior enclosure contains a wide variety of substrates, including natural logs, ropes, platforms, and artificial trees to maximize arboreal exploration of the area. The group is fed two to three times per day and water is available constantly in both the indoor and outdoor areas. For the purpose of this study, we recorded pairings (as used in Schaffner & Aureli, 2005, p. 1096) as the approach of ≤ 1 m for more than 30 min of another monkey. An undergraduate student observed pairings two hours per day, five days per week. Prior to data collection, a training session was held by a faculty sponsor to establish a consensus on this definition of pairings. Due to the data collection schedule, data were collected both in the presence and absence of zoo visitors.

Procedure

First we interviewed two of the Little Rock Zoo's spider monkey keepers (K. Caster & M. Martin, personal communication, October 9, 2010). They helped us to identify individuals and described the known background and familial history for individuals. We collected data from October

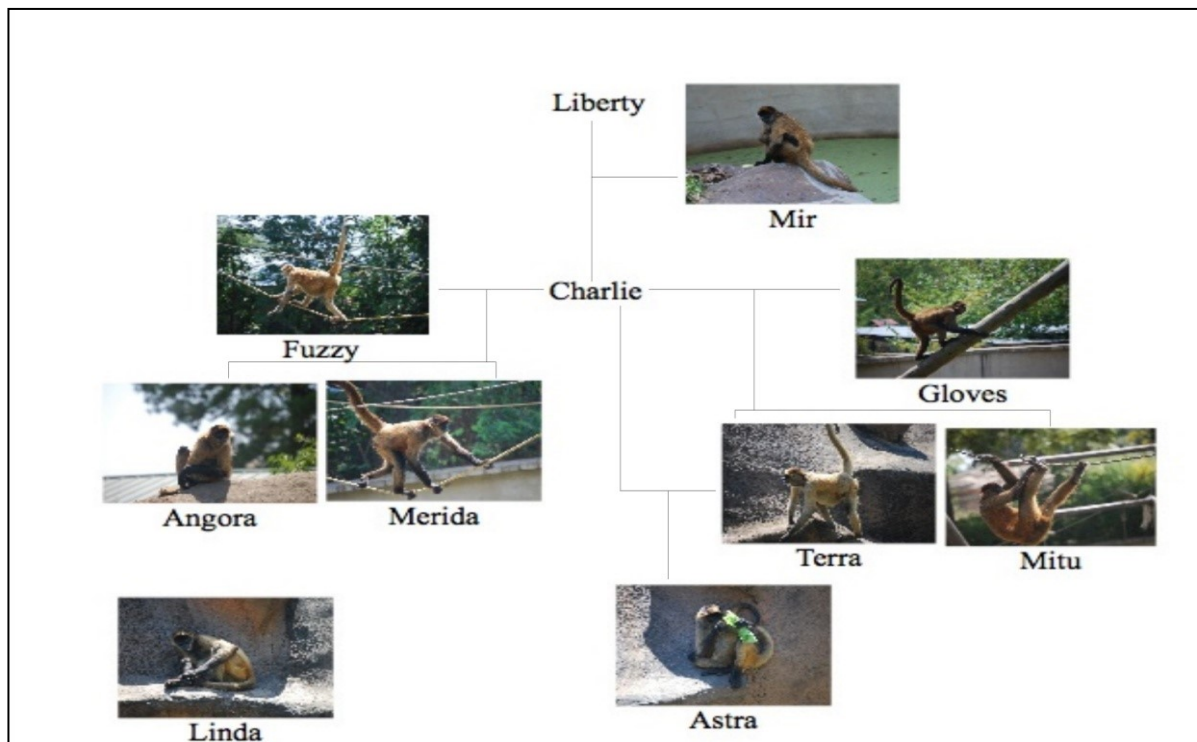


Figure 1. Family Tree of LR Zoo Spider Monkey Troop.

2010 until December 2010. Behaviors were recorded 2 hours per day for a total of 32 days. Data was not collected on weekends, holidays, or during bad weather. Fusion events were recorded as any pairing between two or more monkeys. Due to vegetation and other barriers (e.g., a concrete wall between the indoor and the outdoor components), there were instances where visual separation occurred and monkeys could not be seen. Observations were only recorded when the monkeys were visible.

Results

Our data showed that subgroupings were similar to wild populations observed by Ramos-Fernández, Boyer, and Gómez (2006), with multiple sizes of groupings (groupings of two accounted for 35% of total groupings, three accounted for 20%, four accounted 10%, five accounted for 12%, and six accounted for 7%, no groupings of seven, eight, or nine were noted (see Figure 2)). If a monkey was solitary for 30 minutes, they were recorded as a subgrouping of one (see Figure 2). Similar to wild populations, the Little Rock Zoo spider monkeys frequently pair with each other in small clusters and regularly change membership. The results showed although one individual may have

paired with another particular often, the other individual may have paired more frequently with yet another individual (see Table 1). For example, Merida chose to pair most often with Linda; however, Linda paired more often with Astera; this is reflected across the entire population.

With two males and seven females, the male:female ratio in this group is not dissimilar from wild populations (see Chapman, Fedigan, Fedigan, & Chapman, 1989), which show a skewed male to female ratio (i.e., mean of 1.0: 2.6 in eight populations; Chapman et al., 1989). Despite the similarity in terms of fission-fusion and male to female ratio, the expression of pairings did not reflect those of wild populations in terms of sex. The two males in this troop, Mir and Mitu, were among the lowest in terms of pairings, coming together only six times during the course of the study, which accounts for 12.5% of Mir's pairings and only 7.5% of Mitu's pairings. For Mitu, this is less than with any other monkey. So though this troop engages in fission-fusion as a whole, sex preferences and pairings do not seem to reflect that of wild populations.

The degree of relatedness among this troop is very high. Only one monkey (Linda) is biologically unrelated to the troop. Totaled, she had more pairings than any member ($n = 104$) and accounted

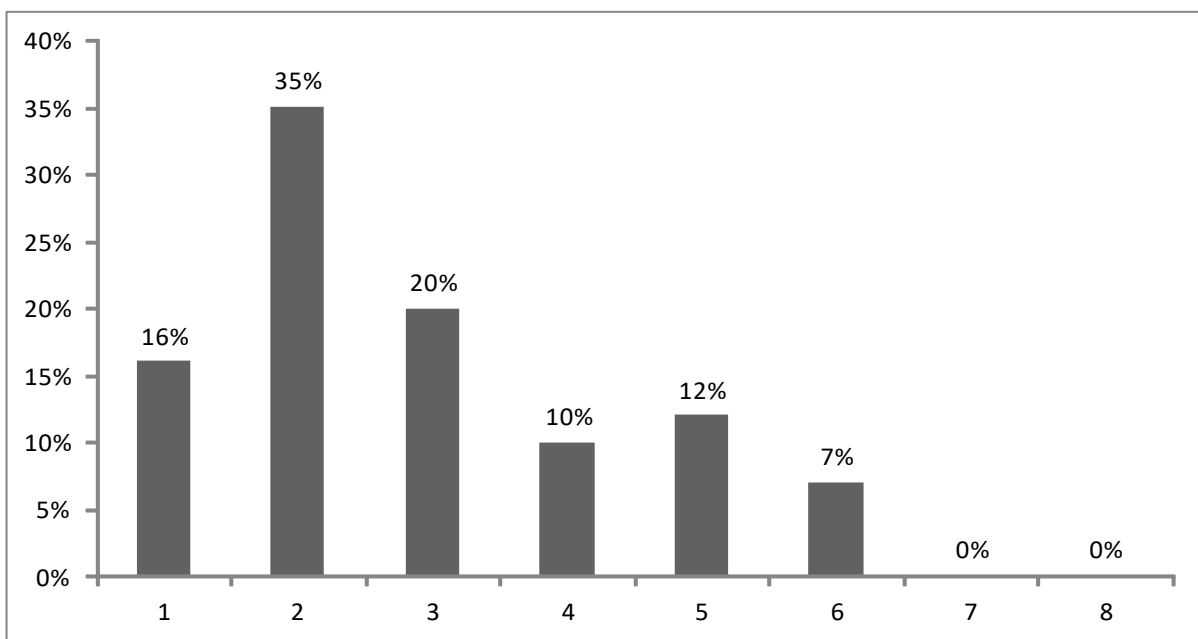


Figure 2. Percentage of time spent alone (subgroup of 1), or with another monkey(s).

Table 1. *Number of pairings among individual monkeys.*

	Angora	Fuzzy	Merida	Linda	Mitu	Gloves	Astera	Terra	Mir
Angora	—								
Fuzzy	9	—							
Merida	12	14	—						
Linda	8	19	17	—					
Mitu	11	10	11	14	—				
Gloves	4	9	8	11	8	—			
Astera	3	13	11	20	9	15	—		
Terra	6	8	9	9	11	11	10	—	
Mir	4	6	7	6	6	5	8	6	—
Totaled	57	86	89	104	80	71	89	70	48

for 14.9% of all pairings. Frequency of genetically-related pairings was highest among Gloves and granddaughter Astera with 15 recorded pairings. Second were Fuzzy and her daughter Merida at 14 pairings. Siblings Mir and Gloves were among the lowest with only four pairings.

Discussion

This project provides evidence of subgroup pairings similar in a troop of captive spider monkeys to those of naturally occurring troops of spider monkeys (see Ramos-Fernández et al., 2006). These findings suggest that although social organization is similar to those in naturalistic settings, the nature of food allocation as its primary cause for pairings is questionable since food is abundant in this captive setting and foraging is not necessary. In addition, competition for mates and defense against predators do not functionally factor into this group as proximate causes. Proximate mechanisms focus on immediate sources of behavior or on questions of how an organism is designed to behave in a given circumstance (Gubernick, 1996; Tinbergen, 1963). Survival for a social individual requires that it maintain itself without being seriously injured, killed, or driven from the group (de Waal, 1986). MacLean (1998) noted that being driven from a group could significantly reduce an individual's chances for survival. How better to achieve survival (and potential reproductive success) than by using behaviors that insure perma-

nence within a group?

According to Schaffner and Aureli (2005), affiliative behaviors such as embracing or social grooming may serve to identify social bonds with others; behaviors enhancing social bonds are possibly a means to maintain oneself within a group. Social relationship bonds are likely proximate mechanisms for survival and reproductive success. For spider monkeys, it appears fission-fusion model for group pairing creates a different type of hierarchical structure allowing for more dispersal and fluidity within and between groups. The adaptive benefit of fluid pairings may be to create bonds with every member of the group to establish a stronger group unit.

Studies of wild spider monkeys populations have shown males will pair and affiliate more with other males (Fedigan & Baxter 1984; Slater, Schaffner, & Aureli, 2009), females pair more with other females, and male-female pairings occur with the least frequency (Weghorst, 2007). This was not the case for this captive troop. Even though the two males Mir and Mitu paired only six times, Mitu and Linda paired 14 times. Degree of relatedness in this troop is also atypical to that of the wild. It is the female in spider monkeys who disperse upon sexual maturity in the wild (Symington, 1987), therefore most adult females are genetically unrelated. This makes comparing kin-based affiliative pairings to those in the wild difficult. Linda, who is biologically unrelated to the troop showed more social

behavior as measured by pairings, than any other monkey. It is possible Linda is embraced more by this troop since she is unrelated, which more closely resembles an immigrated female in the wild. But keepers describe Linda's social behavior as abnormal compared to the other monkeys. She suffers from a disease similar to Alzheimer's, making it impossible to fully understand the nature of her behavior. Also Pastor-Nieto (2001) showed degree of relatedness was not a determinant of cohesion as measured by sharing access to food in a captive spider monkey population. She showed familiarity, and not genetic relatedness, predicted affiliative investment.

Future research should evaluate pairing events involving both male and female, kin and non-kin among captive monkeys. Future direction in this area of animal behavior should evaluate the adaptive nature of fission-fusion from additional evolutionary perspectives and proximate mechanisms. Even in the absence of proximate causes for fusion in the wild, fission-fusion is still expressed in this captive troop, albeit differently among the sexes.

Our study was not without its limitations. One limitation of our study was the lack of separation between behaviors in the presence versus absence of zoo visitors. After talking with the keepers, we felt analyzing the two together was acceptable since the monkeys do not seem overly effected by occasional visitors and the weekend/midday times of our data collection had low attendance. In addition, we had no way of recording interactions at night or when the monkeys were not visible in the exhibit. It is possible subgroupings looked differently in the researcher's absence or behind closed doors. A second limitation is the more serious issue of generalizability. Since our sample lacks the genetic variety one might see in a wild troop, we cannot assume this group would behave as one in the wild. Unfortunately these limitations are common in a zoo setting.

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The ABC's of Videogame Effects: Affective, Biological, and Cognitive Effects of Videogame Play

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Abstract—Violent videogames are common and easily accessible to children. What are the effects on individuals who are not only exposed to violent content, but are active in the process via videogames? This study examined the affective (emotional), biological (physiological), and cognitive (morality) effects of violent videogame play. Participants were randomly assigned to either a violent or non-violent videogame. Heart rate and galvanic skin response were recorded during gameplay. Aggression (both behavioral and self-report), maternal recall, and moral reasoning were measured after gameplay, along with questions pertaining to the gameplay experience. Surprisingly, no significant differences were found by condition for most dependent variables. However, a change in moral reasoning was found in a scale measuring the maintenance of social norms ($p = .024$) such that people who played a violent game showed lower scores than a control group. These results indicate future directions for videogame research and potential implications for moral reasoning.

Keywords: Violence, videogames, morality, aggression, mortality salience

Interactive media such as video games are a relatively new phenomenon in human history. Some individuals classify the medium as beginning as far back as 1942 with Raymond Redheffer's NIM machine (Redheffer, 1948); however, interactive media as we consider it today was first widely introduced into the public in console form with the game *Pong* created by Nolan Bushnell in 1972 (Ellis, 2004). There was moderate success with consoles before 1972, but generally *Pong* is considered one of the big events in video game history. More recently, because of the upwelling of media exposure given to videogames, researchers are interested in the psychological effects the medium has on individuals. While there was general inquiry into the effects of video games on the mind before 1993 (an excellent example being a survey given by Sneed and Runco [1992] asking parents, adults, and children about their opinions on the detrimental effects of video games on children), it was not until after 1993 and the release of the videogame *Doom* (Id Software, 1993) that videogame aggression research boomed.

Doom involved the killing of other humans and demons, in what was graphic detail for the level of technology available. The concern that sprung from this game was what effects on chil-

dren occurred when they are not only passively exposed to the killing of others, but are active in the process via this new medium (e.g., they pull an electronic trigger or push a button to kill an avatar)? This question still remains controversial. At the crux of this issue is the fact that violent videogames are common and easily accessible to children. This is not to say all videogames are violent, but accessibility of violent content to youth has increased.

Why has the videogame franchise flourished in recent years? Olson (2010) suggests videogame play allows for robust mental activity in the context of normal child development. She suggests videogames, even those with violent content, provide the opportunity to socialize with peers, for youth to teach each other, for intellectual challenge and enquiry, and to explore other identities. Also, Olson found the most common reason children consciously had for playing videogames was that "it's just fun" (2010, p. 181). Accessibility to videogames has increased because children find videogame play rewarding and entertaining, and videogames can even provide children with the opportunity to develop. Children provide a demand for videogames because of the enjoyment they receive from playing the games, and the game producers

are more than happy to create the product and make a profit. Because of the fact that children find videogames rewarding, the effects of videogames should continue to be studied. The aim of the current study was to examine some affective, biological, and cognitive effects that videogame play may have on individuals.

Violence

Most of the studies previously conducted examine violent content found in some videogames and whether or not it increases aggression in individuals. Research attempting to answer this question has had mixed findings. One study found level of violence in a videogame was negatively correlated with school performance and positively correlated with level of aggression (Hastings et al., 2009). Anderson and Murphy (2003) supported the correlation between videogame violence and individual aggression. They also found this effect was present in girls. Before this study, the primary research participants had been boys.

Based on seemingly established results that media violence and aggression were related, Fischer, Kastenmüller, and Greitemeyer (2010) tried to determine how different aspects of videogames, coupled with violent content, impact aggression levels. Specifically Fischer et al. examined the effects of customizability in violent games on aggression. These researchers found “participants who played an aggressive video game using their own, personalized character exhibited higher levels of aggressive behavior than participants who played an aggressive game with a non-personalized character” (p. 192). The study suggested this was due to individuals identifying more with the videogame character if they can personalize it.

However, other research (Unsworth, Devilly, & Ward, 2007) suggests aggressive effects of violent videogames are highly dependent upon the individual who is playing. They found when the level of aggression of an individual is measured before, during, and after playing a violent videogame some individuals experience an increase in aggression, while a smaller number of individuals actually experience a slight decrease in aggression. In general, however, Unsworth et al. found the majority of individuals actually experience no change in aggression levels. What is even more telling is they found the participant’s feelings, such as aggressive feelings, prior to the videogame session are 73% effective at predicting whether or not there will be an increase in aggression or not. Due to the mixed findings on this subject, the current

study will employ two different aggression measures in an attempt to be as thorough as possible.

The current study will employ both a behavioral measure of aggression and a survey measure of aggression. The behavioral measure of aggression will be the well-known “hot sauce measure” (Lieberman, Solomon, Greenberg, & McGregor, 1999), in which participants ostensibly give each other variable amounts of hot sauce to drink (further explained in the method section below). Although there is convincing evidence suggesting violent content has only a moderate effect on aggression levels in some individuals, the current study predicts participants who play a violent videogame will show increased signs of aggression, compared to participants who play a nonviolent videogame, as is indicated by the majority of previous research conducted on the subject.

Death Salience

Terror management theory (Greenberg, Solomon, & Pyszczynski, 1997) is constructed around the concept that when individuals are confronted with the idea of death, and they will inevitably die, individuals cling to beliefs they hold in an attempt to gain meaning out of their life. For example, one study found when adults are confronted with death, they often report a higher desire of having children (Zhou, Liu, Chen, & Yu, 2008). Similarly, in instances of death salience, or when an individual is forced to think about death, mothers score higher on scales of Maternal Separation Anxiety (Taubman-Ben-Ari & Katz-Ben-Ami, 2008). Both of these studies found when adults are confronted with death, they have a higher desire to have children and rate younger individuals and children as more likeable. Finally, when adults are confronted with death, they have an easier time recalling positive maternal interactions (Cox et al., 2008). This means individuals who are exposed to death have an easier time recalling a positive experience with their mother than a negative experience. These studies all suggest when individuals are confronted with death, they cherish the relationships they have and rate them as more likeable and wanted.

Violent content in videogames often involves the death of many individuals, and yet there has been no verification death salience occurs. If death salience does occur because of the massive exposure to death associated with violent content, then the potential exists for violent videogames to psychologically emphasize the importance of a child-parent bond. For this reason, the current study

predicts violent videogame play causes death salience (which increases the desire for parent-child bonding) and when confronted with death, participants will have an easier time recalling positive maternal interactions, compared to participants who play a nonviolent game.

Biological and Affective Reactions

The biological reactions individuals have to videogames have remained relatively unexamined. One study found during violent videogame play, systolic blood pressure increases and finishing a videogame (regardless of whether it was violent or not) produced a decrease in diastolic blood pressure (Baldaro et al., 2004). This study verifies interactive media such as videogames do affect humans on a biological level. With extreme exercise, some individuals feel as if they are in a state of bliss termed “the runner’s high.” It is interesting to consider whether there is a similar association made between the biological effects videogames have on individuals and the perceived emotions those individuals have upon reflection of the game.

Roelofs, Hagens, and Stins (2010) determined happiness was associated with an increase in heart rate and unhappiness was associated with a decrease in heart rate. This affirms physiological responses can be associated with specific emotions. This affirmation is supported by another study (Guntupalli, Everhart, Kalinowski, Nanjundeswaran, & Saltuklaroglu, 2007) finding high electrodermal activity is positively correlated with stress and anxiety and negatively correlated with positive emotions, such as happiness. For this reason, the current study predicted participants who experience higher heart rate and lower electrodermal conductance in response to videogames will report enjoying the game more than individuals whose heart rate and electrodermal responses remain unchanged.

Cognitive Reactions: Moral Reasoning

There has been very little research done on the cognitive effects videogame play has on an individual. This is for multiple reasons. Morality is a cognitive effect which is an incredibly difficult construct to quantify in a reliable fashion. Also, the primary focus of videogame effects has been on aggression responses, because they are of more concern to the general public, which can be defined as either a cognitive or an emotional response. The way one morally reasons is not seen as much of a threat to society, compared to one’s aggressive tendencies. Yet, external signs of aggression may

stem from more internal changes in perception; for example, some research suggests violent content in media may lead to moral disengagement (Richmond & Wilson, 2008). These findings are mitigated by the fact that it is unclear which aspects of morality were measured, as examples of their moral dilemmas were not provided nor was an established moral reasoning assessment used.

To avoid these issues and to further explore the cognitive effects of videogame play, the current study employed Rest’s Defining Issues Test (DIT; Rest, Narvaez, Bebeau, & Thoma, 1999). Haskuka, Sunar, and Alp (2008) used the DIT to evaluate the effects of war exposure on moral reasoning. War exposure was defined as the amount of time news stations devoted to a war which was currently occurring, and whether or not the war involved the country in which the study occurred. They found war exposure is negatively correlated with moral reasoning; however, this negative correlation does not mean the individuals were less moral than individuals not exposed to war. Gorman and Duffy (1994) explain a lesser score in the DIT means there was a change in moral reasoning—not necessarily a decrease. This change is typically interpreted in terms of Kohlberg’s (2008) moral development stages. A “decrease” in morality means individuals move from post-conventional and principled reasoning to conventional moral reasoning. This means individuals tended to morally reason according to social norms or what the law says, instead of on ethical principles or with such concepts as the social contract.

The DIT was used to analyze the effects of videogames on morality, but what effects were expected to occur? Rosenkoetter, Huston, and Wright (1990) found there are mild effects on morality associated with television violence in kindergarteners. However, these effects almost entirely disappear by second grade and continue to be mitigated with age. Other researchers distributed a questionnaire to both Chinese and American youth, analyzing their attitudes on the importance of morality both in the real world and in the virtual world (which includes videogames; Jackson et al., 2008). They found both Chinese and American boys are more accepting of violence in the virtual world than they are of real violence. This suggests children and teenagers can distinguish between what is acceptable in the real world and the virtual world. Because of this disconnect and apparent awareness of the differences between the real and virtual world, the current study predicts participants exposed to violent videogame content will

not morally reason differently from individuals who were exposed to nonviolent videogame content. There simply are not enough extant data to support the notion that morality will change based on being exposed to violent videogame content.

Hypotheses

Because this study examined a variety of variables, for the convenience of the reader the hypotheses tested are given below.

- a) Participants who play a violent videogame will show higher signs of aggression compared to participants who play a nonviolent videogame.
- b) Violent videogame play causes death salience and when confronted with death, participants will have an easier time recalling positive maternal interactions compared to participants who play a nonviolent game.
- c) Participants who experience higher heart rate and lower electrodermal conductance in response to videogames will enjoy the game more than individuals whose heart rate and electrodermal responses remain unchanged.
- d) Participants exposed to violent videogame content will not morally reason differently from individuals who are exposed to nonviolent videogame content.

Method

Participants

Forty-eight participants (25 men, 23 women), all of whom were college students between the ages of 18-24 years old ($M = 19.7$, $SD > 5.88$), were recruited from psychology courses. Some participants were offered course credit at the discretion of the instructor. No further compensation was given. Of the 48 participants, 67% were Caucasian, 6% were Black, 6% were Hispanic, 6% were Asian, and 16% identified themselves as "Other."

Independent Variable: Violent vs. Control Video Game

The participants played either a game with violent content or nonviolent content, based on random assignment to condition. The violent game was *Call of Duty: Modern Warfare 9* in which the goal is to shoot and kill other characters within the game, and the nonviolent game was *Sega Superstars Tennis* in which the goal is to score a point on other players by hitting the ball onto their side of

the court in such a way that they are unable to return the swing. The participants played this game with another participant. Each participant played for fourteen minutes with a one minute break after the first seven minutes, so the researcher could assess the physiological arousal of each participant without unnecessary instrumental interference (see below for details regarding physiological measures).

Dependent Variables

Aggression survey. Self-reported aggression was measured using the Buss and Perry (1992) Aggression Questionnaire. This questionnaire consists of 29 questions asking the participants to self-evaluate how characteristic the indicated aggressive action is of them on a standard 7-point Likert scale (1 = *extremely uncharacteristic*, 7 = *extremely characteristic*). These questions include physical aggression questions such as, "Once in a while I can't control the urge to strike another person," anger questions such as, "Some of my friends think I'm a hothead," and other questions concerning hostility and verbal aggression. The scale is scored in terms of total aggression by summing responses, resulting in a possible range of 29 to 203, where higher scores indicate more aggression. The mean of the sample was 81.44 ($SD = 15.45$). Internal consistency for this scale was good, $\alpha = .77$.

Behavioral aggression. Aggression was also measured using the Hot-Sauce Aggression Measure as described by Lieberman et al. (1999). The participants were asked to place any amount of hot sauce they wish into a glass (empty weight being known) for their co-participant to drink. Once the hot sauce was in the glass, the participants were informed their co-participant would not, in fact, have to drink the hot sauce (see procedure section below for more details). The glass was then weighed again, and the difference between this final weight and the empty weight was obtained, resulting in the amount of hot sauce dispensed in milligrams. The possible weight of hot sauce could range from 0-140 milligrams, with the maximum dictated by the volume of the container. The mean of the sample was 6.02 ($SD = 20.04$), with a range from 0 - 126.24 mg (90% of participants used 10 mg or less).

Maternal recall. Although the hypothesis regarding maternal recall specifically predicts effects on positive recall, we tested for any changes in both positive and negative maternal recall. This allowed for testing whether violence has effects on

maternal recall in general, as well as testing for specific types of recall. Half of the participants were asked to recall a single positive/accepting interaction they had with their mother, and the other half of the participants were asked to recall a single negative/critical interaction they had experienced with their mother. Participants were assigned to condition by random counterbalance. In each condition, participants wrote a brief summary of the interaction in space provided.

After being asked to recall the maternal event, emotional reaction was measured using questions adapted from Cox et al. (2008). Participants were asked to evaluate, on a semantic differential scale, how *easy* the memory was to recall and how *vivid* the memory was (anchor words on the left being “not at all” and anchor words on the right being “very easy” for both items). The questions were evaluated by measuring the distance, in millimeters, from the left hand side of the line to wherever the participant placed the “x” indicating his/her answer. The possible range was 0 to 110 mm. The mean of the sample was 72.0 ($SD = 38.49$) for ease of recall and 73.76 ($SD = 40.37$) for vividness of recall. The correlation between the two measures was high, $r(17) = .75, p < .001$.

Physiological arousal. Heart rate and galvanic skin response were recorded using the program Labchart and evaluated using Powerlab equipment. Heart rate was measured in beats per minute, ranging from 60 to 108, and galvanic skin response was measured in microsiemens, ranging from -2.53 to 22.86.

Enjoyment of the game. Enjoyment of the game was measured on two Likert scales asking the participants to indicate how *enjoyable* and *frustrating* the gameplay experience was; both items used the same anchors from 1 to 10 (1 = *not at all*, 10 = *very much so*). The frustration score was reverse-coded and averaged with the enjoyment score, such that higher numbers on the composite indicated more overall enjoyment, with a possible range from one to 10. The correlation between the two items was moderate but not significant, $r(17) = .41, p = .103$.

Moral reasoning. Moral reasoning was evaluated using the Rest’s Defining Issues Test (Haskuka et al., 2008). Participants read five stories, each with 16 questions. An example story is one in which participants are asked to consider whether a man is morally corrupt to steal food from a rich and hoarding individual who will probably not miss the food so his family will not starve. Participant responses were mailed to the Center

for Ethical Development at University of Alabama, and full scores were mailed back to researchers in exchange for a fee per survey.

Several subscale scores are reported, including Personal Interest, Maintaining Norms, P-score (which measures post-conventional reasoning), N2 score (which weighs personal interest against post-conventional reasoning), Utilizer Score (which weighs perceived importance of the issue), and Antisocial score (which measures anti-establishment morality). For each subscale a different possible range of scores exist, with higher numbers indicating higher amounts of moral reasoning within that subscale for the individual participant.

Procedure

Participants were seated two at a time in a room together and given controllers with either a violent or nonviolent videogame ready to play (based on random assignment). Physiological measures were taken as a baseline at this time. Once the game type was chosen, the participants were instructed to play the game for 14 minutes. After seven minutes, the participants took a one minute break during which the researcher once again assessed the physiological measures. Upon completion of the videogame play session, posttest physiological measures were assessed. Participants then completed a survey including all self-report dependent variables and demographics. Participants were then separated into two adjacent rooms and told they had the opportunity to give each other hot sauce to drink. After placing their chosen amount of hot sauce in a cup, they were informed of the deception (i.e., neither participant actually had to drink it) during the debriefing process at the end of the each trial. After debriefing each participant was thanked, asked for permission to use his/her data now that the deception was known, and dismissed. This study was approved by the hosting university’s Institutional Review Board for ethics. Due to experimenter error, some data were not recorded for all participants. Therefore, degrees of freedom reported below report a sub-sample for each relevant analysis.

Results

Testing Hypothesis 1

The first hypothesis was participants who play a violent videogame will show higher signs of aggression compared to participants who play a nonviolent videogame. This effect was first tested using the self-report measure of aggression, which revealed no significant difference by condition, t

(16) = $-1.83, p > .42^0$. Not only was this difference non-significant, but results were also in the opposite direction of the hypothesis; participants in the non-violent game condition reported slightly higher levels of aggression ($M = 90.60, SD > 5^0.8^3$) than participants in the violent game condition ($M = 76.88, SD > 58.2^3$). The hypothesis was also tested using the behavioral measure of hot sauce given to the co-participant to drink; this test was also not statistically significant, $t(46) = -.47, p > .07^2$. Participants in the non-violent game condition gave their co-participants slightly more hot sauce to drink ($M = 7.40, SD > 69.97$) than participants in the violent game condition ($M = 4.64, SD > 56.2^8$). Thus, Hypothesis 1 was not supported.

Testing Hypothesis 2

Hypothesis 2 predicted participants who played violent videogames would have an easier time recalling positive maternal interactions compared to participants who played a nonviolent game. An analysis of variance compared conditions on the composite dependent variable created from combining the single-item measures of ease of maternal recall and clarity of maternal recall. Again, while the hypothesis specified effects on positive maternal recall, analysis was completed for both positive and negative maternal recall, to test for any difference in type of memory. In sum, main effects were tested for both type of game and for type of maternal recall, and the interaction term was tested.

The ANOVA revealed no effects were significant: main effect of type of maternal recall, $F(1, 13) = .72, p > .85$; main effect of video game condition, $F(1, 13) = .83, p > .72$, and interaction term $F(1, 13) = 1.54, p > .68$. For participants asked to recall positive maternal interactions, individuals who played non-violent games were slightly more likely to report ease of recall ($M = 62.00, SD > 87.4^3$) compared to individuals who played non-violent games ($M = 56.00, SD > 98.6^1$), although again this difference was not significant. Therefore, Hypothesis 2 was not supported.

Testing Hypothesis 3

The third hypothesis expected enjoyment of the game to be associated with significant changes in both heart rate and in electrodermal conductance. Scores on both of these physiological measures were found by subtracting baseline values from values measured immediately after ending gameplay. There was not a significant correlation between enjoyment and change in heart rate

during play [$r(17) = -.30, p > .68$] nor between enjoyment and change in electrodermal activity [$r(17) = .16, p = .54$].

Although not relevant to any particular hypothesis, t-tests were conducted to test for effects of videogame condition on both physiological measures, simply for analytical thoroughness. These tests were completed for both the change scores in heart rate and electrodermal activity and on the raw scores for both measures taken immediately after gameplay ended. All four t-tests were non-significant, all $ps > .60$.

Testing Hypothesis 4

The final hypothesis expected participants playing violent videogames would not experience any differences in effects on moral reasoning than would participants who played non-violent videogames. Effects of videogame condition were tested on all morality subscores of the Defining Issues Test. As predicted, there was no effect of videogame condition on most subscores (all $ps > 0.087$). Even though these results were supportive of the hypothesis, extreme caution must be made in interpreting these results due to the nature of prediction of the null.

Surprisingly and against the hypothesis, significant differences by game condition did emerge for the subscale Maintaining Norms, $t(44) = -2.34, p > .468$. Participants who played violent videogames displayed lower scores on this subscale of morality ($M = 30.64, SD > ^2.54$) compared to participants who played non-violent videogames ($M = 36.84, SD > ^3.0^3$). Thus, Hypothesis 8 was only partially supported, due to this unexpected significant result.

Discussion

This study attempted to provide further insight into the cognitive, affective, and behavioral effects of playing video games. The first hypothesis, regarding aggression, was not supported. Individuals put in relatively equal amounts of hot sauce in both the violent and nonviolent conditions, even when possible control factors such as how recently they played the videogame and how well they knew their co-participant were statistically taken into account. One possible explanation is the fact that the university at which this study was conducted has a relatively small campus. Even if individuals report each other as being strangers, it is possible they share a course or may have future courses with the individual, which may limit their willingness to potentially harm each other.

A possible solution to this issue would be to conduct this experiment on a larger campus where individuals have a lower probability of encountering their co-participant again, thus mitigating the perceived threat of future interaction. In addition, another variable that may make this test more viable is changing the substance they are led to believe they will ingest. Instead of using hot sauce, perhaps lemon juice would yield better results. Giving a co-participant lemon juice is still aggressive and unpleasant for the individual who would have to consume it, but isn't as dangerous as hot sauce.

One advantage in the current study was the use of both a behavioral and a survey measure of aggression. Both measures showed the same pattern. However it is unclear whether to conclude violent videogames do not increase aggression or whether there was simply a flaw to this particular experimental procedure. In either case, the results suggest there is potentially a more complex interaction between the individual who plays the videogame and the content of the videogame than some past research has suggested (e.g., Hastings et al., 2009), or particular types of violence in games may have differential effects on felt aggression. Either way, additional research on the topic is warranted.

The second hypothesis was also not supported. This hypothesis was designed to evaluate whether videogames with a lot of death and violence could induce a state of mortality salience. People exposed to death in past research generally have an easier time recalling, and more clearly recall, positive maternal interactions while simultaneously having a more difficult time recalling, and in a less clear manner, negative maternal interactions (Cox et al., 2008). Violent videogames did not produce the predicted effects when recalling either positive or negative maternal interactions. Perhaps the violent videogame of choice did not accurately or realistically present death enough to fully induce a state of death salience. The particular violent videogame used had an unrealistic death mechanic; future research should examine this chain of events in more depth.

Death salience is a potentially interesting construct in videogame research because generally speaking, individuals in a state of death salience value social interactions more, especially familial interactions (Cox et al., 2008). If a father/mother plays a violent videogame with a lot of violence or death with his or her child, and death salience is induced, then the interaction between parent and child has the potential to be a bonding experience.

This would also give the parent the opportunity to talk with his or her child about violence, and death, and any other potentially disturbing subjects found within the videogame they are playing.

Another reason why death salience effects are interesting in the context of violent videogames is the potential problem of desensitization to death (Deselms & Altman, 2003). The results of this study suggest that concern to be unwarranted, at least in some cases. Although not reported in the results, the current study also asked participants about their self-report violent videogame preference and how often the participants played videogames in general; neither variable was significantly associated with maternal recall. This seems to suggest individuals who play a lot of videogames and individuals who prefer violent videogames are similarly affected by deaths within the videogame world, on average, as individuals who play a relatively low amount of videogames, or none, and who prefer nonviolent videogames.

The third hypothesis was unsupported. There appeared to be no relationship between physiological arousal and the enjoyment, or lack of enjoyment, of the videogame experience. One factor which may be skewing these results is that generally speaking baseline heart rate was elevated, potentially due to pre-experiment anxiety. This may have created a ceiling effect for both physiological measures. Future research should have a set time allowed for the individuals to become familiar with being hooked up to the physiological equipment; thus, stress or anxiety would not confound the results. A limitation of the current study was gameplay had to be stopped to record these measures. It would be intriguing to take physiological measures of individuals continuously while playing videogames. Perhaps there is a spike in galvanic skin response in response to a specific action within the game (e.g., each "death" caused by the player) which is lost by taking only the average galvanic skin response measures at specific times.

The last hypothesis, regarding morality, was partially supported. Given the limited research in the field of morality, it was difficult to predict if there would be significant differences by experimental condition. There simply were not enough previous data to formulate a strong directional prediction, so a non-directional hypothesis was predicted. This experiment suggests individuals in the violent condition generally rated concerns about the justice system, laws, and maintaining current standards as equally important in moral

consideration, compared to those in the nonviolent condition. However, on the Maintaining Norms subscale, participants in the violent condition had significantly lower scores than those in the control condition.

The Maintaining Norms subscale measures individuals' perceptions of the importance of maintaining the current legal system, maintaining existing social roles, and maintaining the extant formal organizational structure of society. In short, Maintaining Norms is a measure of a participant's desire to maintain the social status quo in terms of legal roles and standards. One way of interpreting this result is people who played violent videogames felt the current system of justice in the country is not as important or the system has flaws, and these beliefs were held more strongly than participants in the nonviolent game condition. More research is needed given this surprising outcome, as well as on the other subscales (which showed no difference by condition). Again, due to the nature of the null hypothesis, caution must be made regarding conclusions on this hypothesis; it is possible the non-significant results on most subscales reflect a lack of effect due to procedural limitation instead of being theoretically meaningful.

Conclusion

Additional research should be conducted in the area of videogames and aggression and morality, but this should not be the sole focus of videogame research. If the psychological community is investigating whether videogames, as a medium, are potent enough to affect our actions or thoughts, then it only makes sense to investigate multiple effects, including but not limited to the effects studied in the present study. Future research directions may include effect of videogame play on memory retention, combined effects of videogame play and caffeine on attentional processes and aggression, the effects of competitive vs. cooperative gameplay, or the effects of videogame play and character interaction within the game world on stereotype formation and prejudice.

Videogames are a widespread pop culture phenomenon. More research into further effects of videogame play on individuals would benefit both consumers and producers. It would benefit consumers because with more research, videogame designers can make more engaging experiences, and it would benefit producers because a more pleasing experience appeals to a wider audience would produce more revenue. The videogame culture as a whole would benefit from further re-

search, but also policy makers would have more information to adequately address legislation on videogame usage, or even in deciding whether or not legislation is necessary. The videogame industry is currently booming, and the psychological research on videogames should follow suit and expand by investigating the interactions among several potential effects.

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The Effects of Controlling Nonverbal Intimacy

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Abstract—This study aims to increase understanding of how nonverbal behaviors affect feelings of bonding between strangers. When people do not know each other, they tend to feel uncomfortable with intimate nonverbal behaviors, such as physical closeness/touch or eye contact (Hayduk, 1981; Rosenfeld, Breck, Smith, & Kehoe, 1984); this anxiety could increase liking due to excitation transfer theory (Dutton & Aron, 1974) or the hormone oxytocin (Guastella, Mitchell, & Mathews, 2008). Higher intimacy conditions were experimentally created in conditions of physical proximity (high vs. low) and eye contact (maintained or not). Surprisingly, no significant effects of condition emerged on any dependent variables, which included both perceptions of one's partner (e.g., liking) and physiological measures (e.g., heart rate, GSR). These results show some complexities of simple interpersonal interactions; further research could have implications regarding making good first impressions.

Keywords: Social intimacy, proximity, eye contact, nonverbal

The many complexities of social bonding provide a vast array of questions that still need to be investigated. Although individuals make some conscious decisions in forming social bonds, such as planning dates or asking questions to get to know each other better, humans have developed many implicit bonding mechanisms that affect our relationships without us necessarily noticing. It is possible non-verbal mediators of intimacy can have a profound impact on our feelings, perceptions, and relationships.

Research has verified non-verbal factors go hand-in-hand with intimacy. For example, one study (Rosenfeld, Breck, Smith, & Kehoe, 1984) tested the effects of static versus approaching situations, friend versus stranger, and male versus female interactions on the aversion of eye contact. This research shows complex interactions between all of these intimacy variables in how individuals behave in social situations. Other research (Hayduk, 1981) has also shown the existence of a physical proximity factor to friendship intimacy; personal space is greater between acquaintances than friends, because more intimacy is allowed between friends. Although several studies have investigated how various individual constructs predict and influence social intimacy the current research investigates how several predictors of intimacy influence individuals, both physiologically

and psychologically.

Predictors of Social Intimacy: Physical Proximity and Eye Contact

One of the non-verbal interactions expected to have a significant effect on intimacy is physical proximity. Most people would consider physical touch between strangers a significant intrusion of personal space, because it is considered an intimate behavior. Research on personal space has shown a direct relationship between the severity of the intrusion of space and the resulting level of discomfort (Hayduk, 1981). In the same study, the researcher asked participants to report when they felt slightly, moderately, and very uncomfortable as the researcher physically approached them. On average, participants reported feeling slightly uncomfortable at just over 70 cm, moderately uncomfortable at just over 50 cm, and very uncomfortable at a little over 30 cm, giving evidence that physical proximity can elevate levels of discomfort.

Whereas Hayduk (1981) focused on proximity as a control of intrusion, the current study went a step further by adding a manipulation of hand-holding between participants; this was expected to have an additional direct effect on discomfort and other outcomes of increased intimacy. There is sufficient evidence that physical proximity (particularly involving touch) plays a role in bond-

ing. Recent research shows the hormone oxytocin reinforces social interactions and functions in bond formations. This hormone has also been shown to spike dramatically in instances of physical touch (Henricson, Berglund, Määtt, Ekman, & Segesten, 2008; Morhenn, Park, Piper, & Zak, 2008). If physical touch induces oxytocin release and oxytocin release increases bonding, physical touch should increase bonding and intimacy.

Eye contact is another intimate behavior shown to be connected to increases in oxytocin (MacDonald & MacDonald, 2010). Just as suggested with physical proximity, it should be a functional controller of intimacy levels. More evidence that eye contact will effectively control intimacy levels comes from research on social anxiety and eye contact. For example, one study made use of a virtual reality world and found socially anxious women are less likely to maintain eye contact when a virtual character approaches them (Wieser, Pauli, Alpers, & Mühlberger, 2009). The study demonstrated social anxieties affect a woman's tendencies to gaze at another person's eyes, and women will compensate for the increasing intimacy of an approaching virtual avatar.

Equilibrium theory (Russo, 1975) explains multiple factors (such as self-disclosure, eye-contact, and proximity) work together to create a level of intimacy, and these factors must reach "equilibrium" to avoid discomfort. Individuals will naturally compensate for an increase in one level of intimacy by decreasing another level (Aiello, 1977; Argyle & Dean 1965). This effect is so strong even in a virtual world; equilibrium theory plays a role (Wieser, Pauli, Grosseibl, Molzow, & Mühlberger, 2010). The current study adds to previous research by controlling or monitoring both factors reviewed above, simultaneously.

Effects of Social Intimacy: Physiological and Psychological

Physiological measures correlate strongly with the manipulation of social experiences. They reveal significant information about discomfort from the intimacy experienced. As intimacy is increased beyond the point of comfort, physiological excitement occurs. Increased heart rate, blood pressure, and Galvanic Skin Response (GSR) are all physiological measures used to measure social anxiety and/or tension (Meyer, Bahrck, & Fitts, 1953; Wieser et al. 2009; Zhang, Kalinowski, Salklaroglu, & Hudock, 2010). It was reasonable to assume the mentioned physiological measures would be elevated in the current study's conditions

with high social intimacy, compared to low social intimacy conditions, due to individual's increased levels of discomfort (Hayduk 1981; Rosenfeld et al., 1984).

While physiological measures of discomfort are useful in measuring the effects of intimacy manipulations, the more traditional method of assessing psychological effects provides additional information. Studies of the rules of friendship propose people who are mere acquaintances feel uncomfortable with intimacy because intimate behavior is "inconsistent with, and violates, the rules and norms of an exchange relationship" (Argyle & Henderson, 1984, p. 213). Friends are allowed to be much more intimate than people who are not friends. The rules of friendship, while not explicitly taught, instinctually regulate the behaviors deemed appropriate between a given pair of people. The level of intimacy in friendship can make non-friends uncomfortable as they try to gauge whether their acquaintances are trying to form a friendship.

Despite the discomfort experienced in unavoidable intimacy, it seems likely intimacy should increase liking of a partner. Aronson and Mills' classic (1959) study, "The Effect of Severity of Initiation on Liking for a Group," demonstrated an unpleasant initiation into a group will make people report higher liking of the group. Social discomfort during the initiation into a group only enhanced the ratings of the group, so social discomfort of forced intimacy should permit increased liking between participants experiencing uncomfortable social intimacy with a stranger.

Along with the arguments above, it is reasonable to assume this unavoidable intimacy will increase liking because of the release of oxytocin. The social bonding hormone is said to "enhance the encoding of positive social memories," but not negative memories (Guastella et al., 2008, p. 256). Because increased intimacy conditions produce increases in oxytocin, one would expect the increased intimacy conditions to also aid in the memory of positive aspects of the social interaction, therefore increasing individuals' perceptions of each other after the interaction (Kurzban, 2001; MacDonald & MacDonald, 2010).

In other words, controlling levels of non-verbal intimacy between two people should cause bonding effects despite any psychological discomfort. Research has identified a phenomenon known as excitation transfer in which people interacting in a situation that induces excitement or fear are likely to interpret their physiological arousal as attraction to the other person (Dutton & Aron, 1974).

Excitation transfer has been shown to influence attractiveness of people who have not yet developed a bond, but in salient relationships, it has no significant effect (Meston & Frohlich, 2003). This is perhaps because the unavoidable and extreme-seeming intimacy shared by two strangers in a fearful situation induces a bonding effect. The current research is expected to cause physiological arousal in participants, so excitation transfer theory suggests this arousal may contribute to higher ratings of attractiveness of co-participants who experienced anxiety due to high levels of intimacy.

In addition to increased ratings of attractiveness, the current study expected increased perceived “knowing” or understanding of co-participants (suggesting more friendship). In one study (Walker & Wright, 1976), participants rated higher levels of friendship after more self-disclosure with a partner. It seems reasonable other forms of shared intimacy (such as eye-contact and physical proximity) might create the same effect. The assumed release of oxytocin during the increased intimacy behaviors also suggests participants in higher intimacy conditions would score higher on friendship, because oxytocin has been repeatedly shown as a mediator of social bonding (e.g., Guastella et al., 2008).

Hypotheses

Considering past research, this study tested the hypothesis that participants who are told to maintain eye contact will have a greater increase in physiological measures than participants who are told to avoid eye contact (H1). Similarly, participants who must hold hands (high physical proximity) were expected to have a greater increase in physiological measures than participants who were seated six feet apart (low physical proximity; H2). These physiological measures would indicate the strong effect of manipulating the chosen levels of nonverbal intimacy to the point of physiological arousal.

The third hypothesis was compared to participants who are told to avoid eye contact, participants who are told to maintain eye contact will have a higher rating of a) discomfort, b) how well they think they know their co-participants, and c) how well they like their co-participants (H3). In addition, compared to participants who are seated six feet apart, participants who must hold hands will have a higher rating of a) discomfort, b) how well they think they know their co-participants, and c) how well they like their co-participants (H4). The support of these hypotheses would indi-

cate at least some of the effects of forced social intimacy on perceptions in developing relationships.

Method

Participants

Undergraduate students were recruited from psychology courses at a small, private university in Iowa. Extra credit was offered to participants. Participants included 18 men and 44 women ranging from age 18 to 33 ($M = 20.35$, $SD > 2.27$). Sixty-six percent of participants were White, while 34 percent identified with other ethnicities. All participants were paired with same-sex partners with whom they were unacquainted.

Independent Variables

Eye contact. Pairs of participants were randomly assigned to a condition in which they were asked to either maintain eye contact or avoid eye contact throughout the procedure. In the eye contact maintenance condition ($n = 30$), participants were told, “Keep your eyes fixated on your partner’s eyes except when you must check the script.” In the avoid eye contact condition ($n = 32$), participants were told, “Keep your eyes fixated on your script.”

Physical proximity. Proximity and physical touch were manipulated together by randomly assigning participant pairs to a condition in which they sat six feet apart ($n = 34$), or a condition in which they sat directly across from each other, holding hands ($n = 28$). In both conditions, participants were told to sit in the designated seats. In the intimate (hand-holding) condition, they were also told to “grasp the right hand of your partner across the table, as if shaking hands.” In this condition, participants were instructed to continue grasping hands throughout the study.

Dependent Variables

Physiological measures. Several physiological measures were used in the current study, including heart rate, GSR, and blood pressure. For each physiological measure, data was recorded before, during, and after the procedure. Changes were calculated by subtracting the baseline (beginning level) from the measurement at the end, and this change score was used at the main dependent variable for each measure.

Heart rate was measured in beats per minute using a finger pulse monitor. A finger GSR monitor measured hand perspiration of the participants in μS (microsiemen); higher conductivity is

due to sweat in the palms and is associated with discomfort (Zhang, Kalinowski, Saltuklaroglu, & Hudock, 2010). A blood pressure cuff measured the systolic and diastolic blood pressure of participants before, during, and after the manipulation. Healthy systolic blood pressure falls between 90 and 140, and it is known to stay between 50 and 230. Healthy diastolic blood pressure falls between 60 and 90, and it is known to stay between 35 and 135. Data were analyzed using the program Lab Chart.

Psychological measures. General stress/anxiety questions were modified (by asking them in the context of anxiety/stress experienced during the experiment) to create a scale measuring psychological discomfort (Lovibond & Lovibond, 1995). The modified scale contained 14 items regarding their experiences during this experiment using a 9-point Likert scale (1 = *not at all true; disagree completely*, 5 = *moderately true; agree to some extent*, and 9 = *definitely true; agree completely*). The scale asked participants to indicate their agreement on items such as "I had a feeling of shakiness," and, "I found it difficult to relax." Responses were averaged, resulting in a possible range from one to nine with one indicating the lowest psychological discomfort and nine indicating the highest psychological discomfort.

A four-item scale was devised asking questions assessing the level of how well participants felt they know their experimental partner. Participants indicated their agreement with the items on a 9-point Likert scale (1 = *not at all true; disagree completely*, 5 = *moderately true; agree to some extent*, and 9 = *definitely true; agree completely*). Example items are, "I feel like I know my co-participant" and, "I believe I could predict my co-participant's behavior." Responses were averaged, resulting in a possible range of one to nine, with higher numbers indicating greater perceived "knowing" of the co-participant.

The nine items measuring liking of co-participant were adapted from Rubin's Liking Scale (Rubin, 1970). Participants indicated their agreement with the items on a 9-point Likert scale (1 = *not at all true; disagree completely*, 5 = *moderately true; agree to some extent*, and 9 = *definitely true; agree completely*), with items such as "I think that my co-participant is well-adjusted" and, "I would recommend my co-participant for a responsible job." Scores were averaged, resulting in a range from one to nine, with higher numbers indicating more liking of the co-participant.

Procedure

Participants were randomly paired with like-sex partners and each pair was run at a separate time in a small, quiet room in one of four conditions, creating a 2 (eye contact: constant vs. absent) X 2 (distance: touching vs. six feet apart) factorial design. In all conditions, participants were read the following statement, which was a cover story designed to reduce participants' awareness of the expected effects on social discomfort:

This research experiment will study the effect of physical closeness on the physiological mimicry induced by mirror neurons. The study will require you to interact with another participant which can be uncomfortable for some participants. If at any time you would rather not continue with the experiment, you may stop, free of penalty. Your physical measures of heart rate, blood pressure, and finger sweat will be measured with various instruments that will be hooked up throughout the experiment. If you are uncomfortable with this, please feel free to exit the experiment. Please put your email and class for which you would like extra credit on the consent form I have given you and sign it if you would like to participate in this study. Your consent form will be stapled to your data so that I can contact you for a brief follow-up, at which point I will separate the consent forms to make your data anonymous before analysis.

First the researcher measured heart rate (by checking pulse), blood pressure (using a blood pressure monitor), and finger perspiration (using a GSR measure). Each instrument was briefly explained to the participant as his/her physiological activity was measured. Data were recorded on a data sheet.

Participants then listened to the directions for each of the four conditions; full directions are provided in Appendix A. Once the participants were situated in the appropriate position depending on condition, they were handed a list of questions to ask each other (see Appendix B), told which one would start, and allowed to begin questioning one another. When the participants had each asked and answered the first 10 questions on the script, physiological measures were taken again. The participants were allowed to finish reading the questions off the list, and final physiological measures were recorded. Participants were

then given the scales for psychological effects (e.g., perceived liking) and demographics. Participants were then thanked and told to expect a follow-up email by the end of the semester.

After all data had been collected, participants were sent a debriefing email explaining the true point of the experiment and allowing them the opportunity to have their data excluded from the results (no participants requested removal from the study). Debriefing was held until all data were collected in order to maintain the cover story for future participants (due to the small, insular nature of the campus). The hosting university's Institutional Review Board for ethics approved this procedure.

Results

All analyses were completed in both SPSS and SAS. Table 1 presents descriptive information for each physiological dependent variable (means and standard deviations), and Table 2 presents descriptive information for each psychological dependent variable, including means, standard deviations, and alpha levels for internal consistency within scales.

Table 3 presents correlations among all dependent measures, for descriptive purposes. Three correlations reached statistical significance. For the physiological measures, change in GSR was positively correlated with change in systolic blood pressure [$r(58) = .271, p > .48$], and change in systolic blood pressure was positively correlated with change in diastolic blood pressure [$r(58) = .271, p = .04$]. For the psychological measures, perceived knowing of one's co-participant was positively correlated with liking of that person, $r(62) = .354, p = .004$.

To test each hypothesis, analyses of variance were completed, testing for both main effects (eye contact and distance) and for any interaction between these variables. As can be seen in Table 4, none of these tests were statistically significant. No significant differences emerged in any of the physiological or psychological measures, based on experimental condition.

Discussion

This study attempted to further knowledge regarding the psychological and physiological effects of forced nonverbal intimacy. Unfortunately, none of the hypotheses were supported, going against trends identified in previous research. In spite of the lack of effect by condition, the study does suggest several interesting directions and

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changes for future research, due to limitations of the current experiment.

Table 1: *Descriptive Statistics for Physiological Dependent Variables.*

	<i>M</i>	<i>SD</i>
Heart Rate		
Before	81.18	14.77
After	84.66	12.78
During	85.18	12.50
Difference Score	3.48	8.68
Galvanic Skin Response		
Before	3.67	4.61
After	13.24	7.51
During	11.00	7.50
Difference Score	9.67	7.63
Systolic Blood Pressure		
Before	112.33	14.81
After	117.07	15.50
During	119.47	14.00
Difference Score	4.81	12.64
Diastolic Blood Pressure		
Before	70.95	9.65
After	75.84	12.34
During	76.10	8.53
Difference Score	5.36	11.30

The lack of significant differences between participants in the high physical proximity condition and those in the distanced condition was a very surprising and interesting result. Participants asked to hold hands across the table and participants who were seated six feet apart had approximately the same physiological responses and reported discomfort; which is very counterintuitive.

Table 2: *Descriptive Statistics for Psychological Dependent Variables.*

	<i>M</i>	<i>SD</i>	α
Psychological Discomfort	3.08	1.50	.91
Perceived Knowing	4.06	1.54	.76
Liking of Co-Participant	6.66	1.13	.90

The authors assumed holding hands with another participant would be a strong enough manipulation to cause some differences, but this is not what the results indicate.

A possible explanation for this lack of differences can be found by examining the initial physiological responses of participants. Many participants had quite elevated physiological response during what was supposed to be a “baseline” physiological measurement. While the average heart rates and blood pressure measurements do not appear elevated (compared to healthy averages), the large standard deviation reveals significant

variation between participants. Some participants experienced high levels of arousal throughout, while others had consistently low levels of arousal, so perhaps the individuals who would have responded physically to the social intimacy already had heightened arousal at the beginning of the experiment. This is reasonable, considering it is likely many undergraduate psychology students have not been hooked up to all of this equipment before and are likely to experience some pre-experiment anxiety in anticipation of a procedure involving monitoring of their physiological responses. With widespread initial anxiety across all

Table 3: *Correlations Among Dependent Variables*

Variable	1	2	3	4	5	6	7
1. Heart rate	--	.092 (57)	.039 (57)	-.211 (57)	-.100 (56)	.014 (57)	-.089 (57)
2. GSR		--	.270* (58)	.167 (58)	.039 (60)	.053 (61)	.027 (61)
3. Systolic BP			--	.271* (58)	.028 (57)	-.210 (58)	.102 (58)
4. Diastolic BP				--	.111 (57)	-.054 (58)	-.003 (58)
5. Discomfort					--	-.008 (61)	-.035 (61)
6. Perceived knowing						--	.354** (62)
7. Liking							--

Note. GSR > Galvanic skin response. For heart rate, GSR, and both BP measures, correlations were based on change scores from the beginning of the study to the end.

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

Table 4: *Analysis of Variance Results for all Dependent Variables*

Variable	Main Effect for Touching		Main Effect for Eye Contact		Interaction	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
1. Heart rate	0.18	(.673)	1.89	(.175)	0.33	(.566)
2. GSR	0.86	(.358)	0.26	(.614)	1.28	(.262)
3. Systolic BP	3.11	(.084)	1.25	(.268)	2.86	(.097)
4. Diastolic BP	2.33	(.133)	0.07	(.798)	0.00	(.944)
5. Discomfort	0.61	(.437)	0.54	(.467)	0.15	(.700)
6. Perceived knowing	1.30	(.258)	2.27	(.137)	2.56	(.115)
7. Liking	0.13	(.716)	0.79	(.378)	2.77	(.102)

Note. GSR > Galvanic skin response. For heart rate, GSR, and both BP measures, ANOVAs were based on change scores from the beginning of the study to the end.

conditions, the ineffectiveness of the manipulations may simply be due to a ceiling effect. The additional social discomfort might be involved with being coaxed into a high intimacy condition with a stranger may not be statistically significant because the initial discomfort with the physiological equipment played a more significant role. This could explain why both eye contact and physical contact manipulations failed to have any significant effect on physiological response and reported discomfort.

If this interpretation is correct, effects of the manipulations would be more accurately tested if the participants were repeatedly hooked up to the physiological measures before critical testing; this would allow “baseline” measures to more accurately reflect typical physiological levels. Alternatively, having the participants engage in a distraction task before beginning the social interaction might help. Future research may want to consider these possible ceiling effects.

There was a significant positive correlation between perceived knowing and GSR at the end of the experiment ($r = .275, p > .47$). This could be explained in the context of the hypotheses higher intimacy conditions cause a greater change in GSR and that higher intimacy conditions should cause a higher sense of knowing between participants. Although the intimacy manipulations did not have any direct effect on the individual dependent variables, this correlation still occurred. This association could be related to excitation transfer theory (Dutton & Aron, 1974). If participants happened to experience higher GSR by the end of the experiment (regardless of condition), they may have attributed their sweaty palms to a sensation of having been more intimate with their co-participants.

This result is particularly interesting because it suggests if the current study’s manipulation had worked, the hypothesis may have been supported, but the physiological arousal might be the key to the effect on levels of knowing, not the level of social intimacy itself. Physiological arousal appears to be linked to higher levels of perceived knowing, so if higher intimacy had effectively increased arousal, higher intimacy may have correlated with higher levels of knowing, with arousal serving as a mediator. Similar avenues of future research could be explored due to the positive correlation between levels of liking and final systolic blood pressure.

One of the most significant challenges in conducting this research was the campus size. Ideally, research could be conducted using pairs of

complete strangers, but at a university with fewer than 1,000 full-time students, it is difficult to find many pairs of volunteers who are not at least somewhat familiar with each other. The previously discussed research stressing the roles of friendship in boundaries (Argyle & Henderson, 1984; Walker & Wright, 1976) emphasizes the relevance of this challenge. Asking participants to sign up next to names of other students who are not friends was the best this research could do to find people who did not already know each other well. In addition, ideal data analysis would consider pairs using a nested model of analysis, but the sample size in the current study did not allow for these more complicated statistics. Despite the fact that all the data were from participants who either identified their co-participants as strangers or acquaintances, the term “acquaintance” can mean a wide range of things to different people. This was evidenced in the survey responses that occasionally one participant would report his or her co-participant as a stranger; while the other would say they were acquaintances. The word acquaintances could possibly refer to two people who have one class together but sit on opposite sides of the room, or two people who have worked together on projects and have talked quite a bit, but do not consider each other “friends” because they do not get together outside of class.

Further research investigating various other possible intimacy manipulations could produce interesting results. For example, perhaps using varying levels of intimate questions in the script would produce more significant results than the non-verbal intimacy manipulations used in this study. Past research (Rosenfeld, Breck, Smith, & Kehoe, 1984) using some very personal questions and some very impersonal questions has yielded results, suggesting this manipulation could be successful. Including levels of trust as an additional dependent variable would also give new information about how varying intimacy levels influence our judgments. Continued studies on how various intimacy factors influence the way people respond to interactions with strangers could prove interesting and useful.

Finally, many of the studies summarized in the literature review refer to the possible mediating effect of the hormone oxytocin (e.g., Henricson et al., 2008; Morhenn et al., 2008). A limitation of the current study was the lack of ability to measure oxytocin. Under ideal conditions (perhaps possible in future research), oxytocin would be measured and included in statistical tests of meditation (e.g.,

the procedure used by Baron & Kenny, 1986). If nonverbal intimacy increases oxytocin, and this hormone influences psychological perception of the social situation, understanding these links could be very beneficial for future researchers, both in terms of understanding the underlying psychological processes of social intimacy and in terms of possible real-world applications.

Conclusion

In a world with millions of strangers, people are likely to interact with many others they do not know well during their lifetimes. Understanding what factors influence our reactions to strangers, as well as what factors might influence a stranger's reaction to us, can be very useful. Social interactions are so intuitive and sometimes so brief that few people stop to think about how much their palms might be sweating, how fast their hearts might be beating, or how high their blood pressures might be; however all of these factors tie into the complex system of variables contributing to our perceptions of others. First impressions may be influenced by such subtle factors as physical proximity and eye contact. Future research should continue to examine how these constructs overlap, so the academic community can further understand ubiquitous, but brief, social interactions.

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Appendix A: Scripted Instructions, By Experimental Condition

No eye contact, low physical proximity condition: "Please sit in the designated seats facing one another. Keep your eyes fixated on your script at all times. Participant one will begin by reading question one. After participant two has responded, participant two will ask the same question and participant one will respond. Please

continue this procedure until both participants have asked and answered each of the questions on the script. The researchers will be taking physiological measures again while you are talking; please ignore this and continue reading off the script."

Eye contact, low physical proximity condition: "Please sit in the designated seats facing one another. Keep your eyes fixated on your partner's eyes except when you must check the script. Participant one will begin by reading question one. After participant two has responded, participant two will ask the same question and participant one will respond. Please continue this procedure until both participants have asked and answered each of the questions on the script. The researchers will be taking physiological measures again while you are talking; please ignore this and continue reading off the script."

No eye contact, high physical proximity condition: "Please sit in the designated seats facing one another. Grasp the right hand of your partner across the table, as if shaking hands. Maintain this position and keep your eyes fixated on your script at all times. Participant one will begin by reading question one. After participant two has responded, participant two will ask the same question and participant one will respond. Please continue this procedure until both participants have asked and answered each of the questions on the script. The researchers will be taking physiological measures again while you are talking; please ignore this and continue reading off the script."

Eye contact, high physical proximity condition: "Please sit in the designated seats facing one another. Grasp the right hand of your partner across the table, as if shaking hands. Maintain this position and keep your eyes fixated on your partner's eyes except when you must check the script. Participant one will begin by reading question one. After participant two has responded, participant two will ask the same question and participant one will respond. Please continue this procedure until both participants have asked and answered each of the questions on the script. The researchers will be taking physiological measures again while you are talking; please ignore this and continue reading off the script."

Appendix B: List of Questions Discussed by Participants in All Conditions

1. What's your favorite color and why?
2. What's your favorite food and why?
3. What's your favorite holiday and why?
4. What's your major and why?
5. What's your favorite class this semester and why?
6. Describe your schedule this semester.
7. List each member of your immediate family.
8. Tell me about your favorite vacation.
9. What are you planning on doing this J term?
10. Why did you choose BVU?
11. Describe the last movie you watched.
12. What future career are you considering?
13. Describe the plot of your favorite book.
14. What types of music do you listen to?
15. What is your favorite sport and why?
16. What are your hobbies?
17. What organizations (if any) are you involved in?
18. What's one thing you would like to do before you die?
19. If you could travel anywhere in the world, where would you go and why?
20. What would you do if you were the last person alive?
21. Tell me about any bad habits you have.
22. Tell me about someone you respect.
23. What was your favorite television show as a child and why?

Childhood Parentification Associated with Negative Versus Positive Outcomes in Adulthood

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Abstract—Childhood parentification has been linked to many negative outcomes in adulthood and few positive outcomes. The goal of this study was to further explore whether specific types of parentification link to positive outcomes not investigated in previous research. Participants (30 men and 70 women) completed the Parentification Questionnaire and responded to a series of positive and negative statements by indicating how much the statement described them. Results revealed that all three aspects of parentification (instrumental, emotional, and perceived unfairness) were associated exclusively with adverse outcomes. However, emotional parentification and perceived unfairness were linked to many more adverse outcomes than was instrumental parentification. These findings suggest children who take on adult responsibilities are vulnerable to negative outcomes in adulthood such as negative self perceptions, loneliness, and anxiety.

Keywords: Parentification, negative, positive, outcomes, instrumental, emotional

Parentification occurs when children take on adult responsibilities during a time when it is developmentally inappropriate for them to do so (Wells & Jones, 2000). This phenomenon is prevalent in society (Hooper, 2007) and seen across cultures (e.g., Shih, Wu, & Lin, 2010; Titzmann, 2012). There are two primary types of parentification, emotional and instrumental. Emotional parentification occurs when children provide emotional support to other family members, such as having parents confide in them. Instrumental parentification occurs when children take on family tasks that are typically done by adults, such as washing clothes or caring for siblings. Parentification often co-occurs with perceptions of unfairness in the home, and these perceptions are conceptualized as a sub-set of parentification (Jurkovic, Thirkfield, & Morrell, 2001). Typically, the children who are taking on the adult role are aware of the atypical nature of the home situation and believe it to be unfair, leading to feelings of resentment. Parentification develops during childhood, and can continue into adult life, with both negative and positive outcomes for children (Carroll & Robinson, 2000; Hooper, Marotta & Lanthier, 2008; Jurkovic et al.,

2001; Peris, Goeke-Morey, Cummings, & Emery, 2008; Wells & Jones, 2000).

Several factors are believed to have a causal with parentification. For example, family unpredictability, parental alcoholism, poor parental health, and marital conflict are linked to parentification (Burnett, Jones, Blwise, & Ross, 2006; God-sall, Jurkovic, Emshoff, Anderson, & Stanwyck, 2004; Hooper, DeCoster, White, & Voltz, 2011; Kelley et al., 2007; Peris et al., 2008). Some of these factors exert a stronger influence than others. For example, Carroll and Robinson (2000) found children of workaholics and children of alcoholics both had the potential for parentification; however, the children of workaholics experienced significantly higher levels of parentification than children of alcoholics. The most likely explanation is that workaholic parents are physically absent from the home to a greater degree than an alcoholic parent, who is more likely to be emotionally absent. Children without a parent in the home are more likely to have to take on adult responsibilities. In sum, not only are there many factors leading to parentification, these factors may have differential impacts.

In addition to being multi-causal, parentification is linked to multiple negative outcomes. Castro, Jones, and Mirsalimi (2004) found a positive relationship between childhood parentification and the impostor phenomenon, defined as not believing in one's self or abilities. Children who experienced parentification and the impostor phenomenon felt as if they lacked uniqueness, talent, and the ability to meet others' demands. The experience of childhood parentification also has been linked to feelings of shame in adulthood (Wells & Jones, 2000). Shame-prone individuals feel badly about themselves; instead of focusing on correcting bad behaviors, they are paralyzed by self-blame. Even more serious, parentification has been linked to a variety of pathologies such as eating disorders, mood disorders, substance abuse disorders, and personality disorders (Hooper et al., 2011), as well as overall mental health symptomology (Hooper & Wallace, 2010). Taken in conjunction, these findings suggest childhood parentification can lead to a range of negative adult outcomes.

Despite these adverse associations, previous research has revealed some positive outcomes linked to parentification. Hooper et al. (2008) found people who experienced parentification have the potential for posttraumatic growth. Specifically, these adults are likely to show increased resiliency, an improved ability to respond to life's challenges in a positive and constructive manner. However, even in this study, the level of growth was considered minimal and emotional parentification was simultaneously linked to distress. Focusing specifically on instrumental parentification has yielded more consistent positive findings. Thirkield (2002) demonstrated childhood instrumental parentification predicted greater interpersonal competence in adulthood. Similarly, instrumental parentification in the form of caring for siblings was linked to psychosocial adjustment instead of maladjustment (Fitzgerald, Schneider, Zinzow, Jackson, & Fossel, 2008).

The current theory to explain these positive outcomes is that successfully handling adult responsibilities, such as caring for siblings as children, may elicit feelings of self-efficacy (Fitzgerald et al., 2008). This theory would explain why instrumental parentification, which is characterized by children taking responsibility for adult chores, has

been linked to more positive outcomes than parentification in general. Further support for this theory comes from Williams and Francis (2010) who argued that children with an internal locus of control may be shielded from the negative effects of parentification while still gaining benefits. People with an internal locus of control, who feel personally in control of life events, are more likely to take credit for their accomplishments and thus experience self-efficacy.

The relationship between parentification and positive outcomes can be complicated. For example, Hooper, Doehler, Jankowski, and Tomek (2012) found that adolescents with alcoholic parents were less likely to have alcohol problems themselves if they were experiencing parentification, a seemingly positive outcome. At the same time, parentification was linked to an increase in depressive symptoms for adolescents with alcoholic parents. In other words, parentification was a buffer for one adverse outcome and a moderator for the other.

In sum, past research suggests childhood parentification is linked to some positive and many negative adult outcomes. Because much of the previous research has assumed and examined adverse outcomes, Hooper et al. (2008) argued for a more thorough examination of potential positive outcomes. Thus, the goal of this study was to further examine how the different aspects of parentification link to a series of positive and negative adult behaviors, with the intention of identifying positive associations previously uninvestigated. We hypothesized instrumental parentification would be linked to more positive outcomes in comparison to emotional parentification and perceptions of unfairness. We also hypothesized emotional parentification and perceptions of unfairness would be linked to more negative outcomes. Last, we hypothesized participants high in all types of parentification would show a stronger desire for a stable career and income than participants low in parentification, in an effort to overcome the instability of growing up in a parentification environment.

Method

Participants

Participants were 30 men and 70 women, with a mean age of 20.29 ($SD = 3.69$) enrolled in a

southeastern university. Fifty-seven percent of participants were Caucasian, 31% were African-American, and the remainder represented other ethnicities. Thirty-eight percent of participants were the oldest child in their families, 38% were youngest children, 14% were middle children, and the remainder was only children. The average family income reported by participants was \$72,000 ($SD > £95,444$). Participants were given extra credit for participation and all participation was voluntary.

Materials and Procedure

Instrumental and emotional parentification and perceived fairness in participants' childhood homes were measured with a modified Parentification Questionnaire (Hooper & Wallace, 2010). The original Parentification Questionnaire was a 30 item, self-report measure developed by Jurkovic and Thirkield (1998). Hooper and Wallace (2010) focused on 21-items that loaded on three constructs (instrumental parentification, emotional parentification, and perceived fairness), and demonstrated this modified scale as a reliable measure of parentification; Cronbach's alpha coefficients were over .80 for all scales (instrumental parentification = .81, emotional parentification = .82, perceived fairness = .88).

A "Perceptions of Fairness" score (POF), an "Emotional Parentification" score (EPS), and an "Instrumental Parentification" score (IPS) were computed for each participant by following Hooper and Wallace's (2010) instructions to reverse score specified items and then calculate the mean for the relevant questions on each dimension. A higher POF score indicated that participants perceived a greater sense of unfairness in their childhood home. For IPS and EPS, a higher score indicated more experience with the particular type of parentification.

Instrumental parentification included five items such as, "I often did the family's laundry" and "My parents expected me to help discipline my siblings." Emotional parentification included seven items such as, "At times I felt I was the only one my mother or father could turn to" and "In my family I often made sacrifices that went unnoticed." Perceived fairness included nine items such as, "My parents often tried to get me to take their sides in

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conflicts" and "It often seemed that my feelings weren't taken into account in my family." Participants rated how true each statement was of them on a five-point Likert scale with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree." The higher the score for each sub-scale, the more of that specific type of parentification the participants experienced in their childhood homes.

A series of statements were also created to reflect both positive and negative adult outcomes. These outcomes were selected by having the four authors of this study, who were familiar with the published literature on this topic, independently generate a list of psychological outcomes with the potential to be linked to parentification. Variables investigated in previous studies or variables appearing on only one list were eliminated. From the remaining items, 19 were selected to represent positive outcomes (e.g., self-confidence, practical, organized, emotionally open to others) and 15 were selected to represent negative outcomes (e.g., anxiety, loneliness, harsh self-evaluation, pessimistic view of the future). A larger number of positive outcomes were selected because previous research focused more heavily on negative outcomes and to meet Hooper et al.'s (2008) request for more efforts to link parentification to positive outcomes. Participants rated how much each outcome matched their adult experiences on a five-point Likert scale with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree." The higher the score, the more the specific outcome characterized the participant.

Participants were asked to respond to two questions related to their future career plans. One question asked participants to estimate their future income with an open-ended response. A second question asked participants to rank four life outcomes: getting married, having children, making money, and having a successful career (1 represented "Most important" and 4 represented "Least Important"). Participants were also asked to indicate to which family members they felt emotionally close. Participants could select as many options as desired from mother, father, some of my siblings, and all of my siblings. Last, participants provided demographic information including their grade point average and family income of the home in which they were raised. Participants were sur-

veyed in group settings. Participants responded first to the parentification questions followed by the positive and negative statements. Demographics were assessed last.

Results

The relationships among the sub-scales were examined using Pearson's correlations. Emotional parentification and instrumental parentification were positively correlated, $r(93) = .55, p < .45$. POF was positively correlated with both instrumental, $r(90) = .38, p < .45$, and emotional parentification, $r(96) = .68, p < .45$. These correlations, revealing medium to large effect sizes, among the sub-scales are consistent with previous research (e.g., Hooper & Wallace, 2010).

The negative outcomes selected for this research project were positively correlated, providing one reliability check. To cite but a few examples, anxiety was positively correlated with harsh

self-evaluations, $r(97) = .41, p < .45$, and a pessimistic view of the future, $r(96) = .27, p < .45$. Loneliness was positively correlated with a pessimistic view of the future, $r(96) = .24, p < .49$, difficulty relying on others, $r(97) = .43, p < .45$, and difficulty expressing emotions, $r(97) = .25, p < .015$.

Relations with IPS

Bivariate correlations were conducted to examine possible relationships between the IPS and parentification statements. The higher the IPS, the less participants viewed themselves as practical, $r(93) = -.24, p < .49$, and organized, $r(93) = -.21, p < .49$. The higher the IPS, the more participants liked to solve their own and others' problems, $r(91) = .30, p < .45$, and the lower their grade point average, $r(86) = -.29, p < .45$. These correlations represent small effect sizes and are depicted in Table 1.

Table 1. Adult outcomes associated with parentification sub-scale scores

Outcomes and Variables	Parentification Sub-scales		
	IPS	EPS	POF
Positive Outcomes			
Self-esteem		-.38	-.51
Self-confidence		-.26	-.37
Attractive		-.28	-.32
Practical	-.24	-.26	
Organized	-.21		
Emotionally open to others		-.28	-.27
Comfortable working with others		-.22	
Negative Outcomes			
Experiencing anxiety		.43	.35
Feelings of loneliness		.43	.49
Find it hard to rely on others		.34	.43
Difficulty expressing emotions		.26	.35
Harsh self-evaluations		.27	.33
Pessimistic view of the future		.22	.22
Participated in therapy		.38	.30
See myself always taking care of others		.39	
Often try to solve my own problems as well as others' problems	.30	.23	
Hold back from doing things I want to do			.21
Career Variables			
Family income	-.27	-.23	-.26
GPA	-.29		
Expected income			.23
Importance of career		.23	

*Presented correlations significant at $p < .05$

Relations with EPS

Bivariate correlations were conducted to examine possible relationships between the EPS and parentification statements. The higher the EPS, the lower the participants' self-esteem, $r(99) = -.38, p < .45$, the less confidence they had in their abilities, $r(99) = -.26, p < .49$, and the less attractive participants rated themselves, $r(98) = -.28, p < .45$. The higher the EPS, the more anxious participants rated being, $r(99) = .43, p < .45$, and the more alone participants felt, $r(96) = .43, p < .45$. A higher EPS was positively correlated with participants feeling uncomfortable expressing their emotions, $r(97) = .26, p < .45$, and finding it difficult to rely on others, $r(97) = .34, p < .45$. A higher EPS was negatively correlated with being emotionally open to others, $r(99) = -.28, p < .45$, and being comfortable working with others, $r(99) = -.22, p < .49$. Participants with a higher EPS were more likely to evaluate themselves harshly, $r(97) = .27, p < .45$, hold a pessimistic view of the future, $r(96) = .22, p < .49$, and have spent time in therapy, $r(97) = .38, p < .45$. The higher the EPS, the more participants saw themselves as taking care of other people, $r(97) = .39, p < .01$, and desired to solve their own and others' problems, $r(97) = .23, p < .49$. These relations reveal both small and medium effect sizes and are depicted in Table 1.

Relations with POF

Bivariate correlations were conducted to examine possible relationships between the POF and parentification statements. The higher the POF, the lower the participants' self-esteem, $r(96) = -.51, p < .45$, the less confidence they had in their abilities, $r(96) = -.37, p < .45$, and the less attractive participants rated themselves, $r(95) = -.32, p < .45$. The higher the POF, the more anxious participants rated being, $r(96) = .35, p < .45$, the more participants agreed that they held themselves back from doing things, $r(94) = .21, p < .49$, and the more alone participants felt, $r(93) = .49, p < .45$. A higher POF was positively correlated with participants feeling uncomfortable expressing their emotions, $r(94) = .35, p < .45$, and finding it difficult to rely on others, $r(94) = .43, p < .45$. A higher POF was negatively correlated with being emotionally open to others, $r(96) = -.27, p < .45$. Participants with a higher POF were more likely to evaluate them-

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selves harshly, $r(94) = .33, p < .45$, hold a pessimistic view of the future, $r(93) = .22, p < .49$, and have spent time in therapy, $r(94) = .30, p < .45$. These relations reveal primarily medium effect sizes and are depicted in Table 1.

Additional Findings

Bivariate correlations were conducted to examine possible relationships between IPS, EPS, POF, and statements related to participant's future success. The lower the family income, the higher the IPS, $r(85) = -.27, p < .49$, the higher the EPS, $r(90) = -.23, p < .49$, and the higher the POF, $r(89) = -.26, p < .49$. The higher the POF, the more income participants expected to have in their future career, $r(74) = .23, p < .49$. Emotional and instrumental parentification did not predict expected income; however the higher the EPS, the more important having a successful career was to the participant, $r(92) = -.23, p < .49$. These relations reveal small effect sizes and are depicted in Table 1.

Next, ethnicity and sex differences were explored. African-American and Caucasian participants were compared using an independent t-test. These two groups did not differ on any of the parentification sub-scales. Similarly, there were no sex differences on parentification sub-scale scores.

Finally, relationships between parental closeness and the parentification scales were assessed. Participants who were close to their mothers were compared to participants who reported not being close to their mothers. Participants who were close to their mothers had lower POF, $t(93) = 6.49, p < .45$; EPS, $t(95) = 2.14, p < .49$, and IPS, $t(90) = 2.34, p < .49$. Participants who were close to their fathers were compared to participants who reported not being close to their fathers. Participants who were close to their fathers had lower POF, $t(93) = 4.02, p < .45$, and EPS, $t(95) = 2.51, p < .05$.

Discussion

We hypothesized instrumental parentification would be associated with more positive outcomes than would emotional parentification and perceptions of fairness. This hypothesis was not supported. Adults who had experienced instrumental parentification viewed themselves as less practical and less organized. In other words, in-

strumental parentification was negatively associated with these two positive outcomes. These participants also reported lower college GPAs, another negative outcome. One possible explanation is that participants who, as children, were expected to take on adult responsibilities rebelled against that in adulthood, choosing to be less practical and less organized. Another possibility is that these adults were comparing themselves to a high, perhaps unachievable, standard that had been created during childhood for them and as adults they found themselves failing to meet the standard; thus, they perceived themselves as being less organized and practical. The participants could have also been less organized and less practical because of watching parents who portrayed these traits making it a learned behavior.

Adults high in instrumental parentification also were more likely to feel the need to solve their own problems and those of others. This pressure may be directly related to their childhood experience of being responsible for the care of others. Perhaps children who are raised in a situation where they are responsible for others incorporate that sense of responsibility into their adult identity. Although being responsible is a healthy trait, feeling as though others' problems are yours to solve can be unhealthy and overwhelming.

We also hypothesized emotional parentification would be primarily associated with negative outcomes. This hypothesis was supported. Emotional parentification was associated with a variety of adverse outcomes such as negative self-perceptions, anxiety, social discomfort, pessimism, and time spent in therapy. Hooper et al. (2008) also found emotional parentification to be strongly linked to negative adult outcomes such as distress. Emotional parentification may affect children's self-perception, as well as their view of others, leading to negative outcomes related to self and relationships. These children may not have been able to develop a healthy self-image and coping strategies as a result of being distracted by the emotional needs of their parents. In addition, these children may not have had role models in their lives with healthy self-images and coping strategies to learn from, which could increase their likelihood to adopt the unhealthy self-images and coping strategies of individuals around them.

Participants who experienced high levels of perceived unfairness in their childhood exhibited similar characteristics to participants high in emotional parentification. POF was highly correlated with emotional parentification. Perhaps the overlap in adverse outcomes reflects the fact that participants who experienced emotional parentification simultaneously perceived their home situation to be unfair.

Overall, the three sub-scales were linked to negative adult outcomes; however, instrumental parentification was associated with fewer negative outcomes than emotional parentification and perceptions of fairness. This pattern somewhat matches previous research in which positive adult outcomes were more likely to be linked to instrumental parentification than to emotional parentification or perceptions of fairness (e.g. Fitzgerald et al., 2008; Thirkield, 2002). A current theory is that instrumental parentification leads to feelings of self-efficacy (Fitzgerald et al., 2008). Our study provides some support for this theory, as participants high in instrumental parentification did have some negative perceptions of their abilities; however, they did not view themselves as incompetent across all realms.

Hooper (2007) suggested parentification could be better understood in the context of attachment theory, where parentification serves to interfere with healthy attachment between the parent and child. Emotional parentification and perceived unfairness may be particularly detrimental to the parent-child relationship, as they both contain an emotional element. Instrumental parentification, in contrast, is more about practical matters, such as getting dinner on the table and has even been linked to increased interpersonal competence (Thirkield, 2002). Our data provide support for the idea that parentification interferes with healthy parent-child attachment as proposed by Hooper (2007). We found that participants who had a close relationship with their mothers had lower rates of all types of parentification. Participants who had a close relationship with their fathers were less likely to have perceived unfairness and emotional parentification.

Previous research linked parentification to lower income (Burton, 2007). Our findings matched, with all types of parentification being

linked to lower family income. We hypothesized that participants high in parentification would desire a stable career, an assumption that was partially supported by the data. Participants who scored higher on perceived unfairness expected to have a higher career income, while participants who experienced higher levels of emotional parentification felt that it was important to have a successful career. Instrumental parentification was not associated with career goals. One possible explanation is that participants who experienced emotional parentification and perceived unfairness valued a steady income and a stable job as a result of the poverty and burdens they experienced as a child.

This study had limitations. The sample was drawn from college students; adults who experienced extreme parentification may not be enrolled in college and thus not have the opportunity to participate in parentification studies. Another limitation is that the Parentification Questionnaire requires participants to recall childhood experiences, a method that is subject to some level of inaccuracy and bias. Both of these limitations are characteristic of the research in this domain with few exceptions (e.g., Hooper et al., 2012).

Overall, parentification was linked to negative rather than positive outcomes in adulthood. Emotional parentification and perceptions of unfairness in the childhood home were associated with more negative outcomes than was instrumental conditioning. An increased understanding of parentification may lead to the development of strategies to combat the negative experiences in early childhood, such as counseling techniques, positive mentors and role models, and training to identify situations where parentification is occurring. One timely application might be to military families where one or both parents are deployed, leaving the children to take on increased household responsibilities. Future researchers may want to examine whether the effectiveness of specific intervention strategies depends on the cause of the parentification.

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Construct Validation of the Five Love Languages

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Abstract—The purpose of this study was to investigate the factor structure of a novel questionnaire reflecting the love languages as advocated by Chapman (1992) in his popular books on the topic. The study assessed the preferences primarily of undergraduate students for statements reflecting behaviors theorized to reflect the five different love languages. Although the resulting scale achieved a high internal consistency, confirmatory factor analyses produced five love language factors that were moderately intercorrelated and not representative of Chapman’s purported languages, both contrary to predictions. Future research should be directed towards further exploration of the love languages as valid constructs, as well as subsequent study regarding the utility of the love languages in benefiting emotional and interpersonal relationship dynamics.

Keywords: Love languages, Chapman, love styles questionnaire

The study of love and romantic attachment has been prolific in the psychological literature, with a keyword search in the PsycInfo database producing over 8,500 citations regarding the two experiences. Studies of these universal and important human experiences vary considerably, ranging from exploration of their definition (Fraley & Shaver, 2000; Gonzaga, Keltner, Turner, Campos, & Altemus, 2006; Thompson & Borello, 1992; Yela, 2006) and expression (Wilkins & Gareis, 2006), to challenges in their measurement (Acevedo & Aron, 2009; Hendrick & Hendrick, 1989), and even attempts to experimentally induce a valid love response in the laboratory (McClanahan, Gold, Lenney, Ryckman, & Kulberg, 1990). Outside of scientific circles, a common idea in pop culture today is that people have “types” or “styles” of people with whom they are likely to have positive or romantic relationships (Borrello & Thompson, 1990; Chapman, 1992). This notion is reflected in the language of laypersons, in our social media, and in online matchmaking sites. Recently psychologists have shifted some attention to whether there is any observable truth to this notion (e.g., Hahn & Blass, 1997; Neto, 2007).

One area of exploration regarding the possible existence of love styles is that of strategic facili-

tation, or the relaying of emotion in communication or action in romantic relationships. This communication pattern has been demonstrated as a predictor of increased feelings of love (Ellis & Malamuth, 2000). Identification of strategic facilitation abilities in a prospective partner may begin as early as when one develops a dating partner preference. Some identified qualities of love styles include communication similarities and language styles, shown to have predictive value in romantic relationships (Ireland et al., 2011). Hahn and Blass (1997) and Ireland et al. (2011) demonstrated that potential partners with similarly prioritized love styles, as identified through strategic facilitation behaviors, were preferred over those with style preferences different from the seeker. The love styles explored by Hahn and Blass were those originally outlined by Lee (1977, as cited in Hahn & Blass, 1997). Many related studies identify the tendency for people to prefer relationships with those individuals who have a similar style of showing love, quite possibly because compatible styles reflect compatible personality traits (Arnold & Thompson, 1995; Hahn & Blass, 1997; May & Jones, 2005). This partner preference is likely also due to the psychological similarities between the individuals in the relationship, resulting in im-

proved communication between the two (May & Jones, 2005). In addition to emotional communication, a person's experience with the behaviors of previous partners can be predictive of reactions in similar future situations as well. For example, being reminded of previous relational satisfaction or dissatisfaction was predictive of attitudes toward new relationships (Berk & Anderson, 2008; Mohr, Cook-Lyon, & Kolchakian, 2010). To further support the value of guided affection-giving skills, Floyd et al. (2007) found a link between verbal, non-verbal, and supportive acts of affection and physiological state, including physical health. Their study demonstrated individuals who reported high levels of affectionate communication in their most affectionate relationship had lower heart rates and lower levels of cortisol in their blood in response to laboratory induced acute stressors.

In addition to emotions and behavioral histories, cognitive appraisal of other's intentions and the perceived value of a given relationship may be a key to understanding and communication, leading to a need for clarity in how individuals perceive the receipt and return of affection (Feeney, 2005). Similarly, the state of mind one has about one's partner is also highly predictive of the interactions between the two, which promotes the belief that known dispositions of another could facilitate stronger communication and expression of emotion (Furman & Simon, 2006). Algoe, Gable, and Maisel (2010), for example, provide evidence that perceptions of a romantic partner's actions can be predictive of the other partner's response to them. Therefore, the perception of a romantic partner's actions is likely to affect the way in which a person responds romantically. Similarly, Lacey, Reifman, Scott, Harris, and Fitzpatrick (2004) demonstrate that a moral disposition towards particular attitudes or habits, for instance, weighs into attraction and sexual behavior; for when these factors are included, love styles often determine partner choice.

In summary, there seems sufficient empirical evidence to support the notion that love styles comprised of emotional, cognitive, and behavior patterns likely exist, and that these love styles or languages may offer insight into the needs and meaningfulness of particular actions for others, allowing others to more fully understand them and

deepen their romantic relationships.

The Five Love Languages

One popular example of a romance-facilitating "language" of expression is the love languages proposed by Chapman (1992), whose website dedicated to the constructs offers 30 related books and other products. The site further claims his original 1992 book is a recurring New York Times bestseller and has sold over five million copies, as well as being translated into 38 languages (Jan. 2013, Retrieved from <http://www.5lovelanguages.com/resources/books/>).

Although very popular, the ecological validity of the five languages does not as of yet have empirical support. Based on a fairly exhaustive database search (52 separate multidisciplinary online databases, using keywords "Chapman", "love languages"), the current scientific literature regarding Chapman's love languages is limited to a single published study in a communications journal (Egbert & Polk, 2006) and a handful of unpublished dissertations (Moitinho, 2000; Sallas, 2009; Thatcher, 2005; Veale, 2006).

Egbert and Polk (2006) sought to validate the existence of the five relational styles or love languages proposed and popularized by Chapman (1992), including words of affirmation, acts of service, receiving gifts, physical touch, and quality time. They argue that any given person will have a love language that most strongly guides their romantic behaviors toward others and by which they feel most loved. Participants completed a 20-question scale in Likert format assessing how frequently they displayed behaviors presumably related to each of the love languages. Factor analysis of the results suggested that the hypothesized five factor model only marginally fit the data, but was a superior fit to the one, three, and four factor models also evaluated. There was also a degree of inter-correlation among the love languages, particularly words of affirmation and quality time, suggesting that the love languages as operationalized by their instrument may not be as orthogonal as Chapman suggested.

Given this paucity of construct validation research, investigating the validity of Chapman's (1992) styles through the use of self-report questionnaires is arguably the most efficient way to

advance research in this area. This is particularly evident when alternatives such as behavioral observation, daily activity logs, or other means beyond self-report would be cumbersome and potentially unreliable at the construct level. Insights into the intent and meaning of the actions derived through constructs such as Chapman's love languages could allow deeper partner appreciation, further understanding of romantic relationships in general, and clarity as to how to return love to another most effectively, all of which could be communicated most efficiently through questionnaire results. While Egbert and Polk began this validation process, their assessment focused on the frequency with which certain behaviors were demonstrated in romantic relationships, where assessing preferences for those behaviors rather than frequencies would likely demonstrate more fidelity to Chapman's constructs. Further, Egbert and Polk (2006) used a questionnaire with only 20 items, or only four items per language, which is arguably an insufficient number of items for developing a reliable scale. This shortfall is further reinforced by the fact that Chapman's (Jan. 2013, Retrieved from <http://www.5lovelanguages.com/>

profile/wives/) online questionnaire contains 30 item pairs (12 items per love language), clearly suggesting that Chapman at least advocates a more extensive sampling of each language.

The Present Study

The importance of healthy relationships and affection-building skills does not lack empirical support, and specific forms of guidance such as the love languages ought to be pursued as realistic means of promoting these needs within and outside of committed romantic relationships. In response to these important ends, our study seeks to explore whether the proposed love languages described by Chapman can be reliably demonstrated and measured through a novel instrument, and to what extent those languages are orthogonal as Chapman suggests. Further, Chapman (1992) notes that although a person may express or receive love in more than one language, ultimately a single language will predominate. For this reason, a questionnaire of sufficient length and structure to allow a single language to dominate reliably will most accurately reflect Chapman's hypothesis.

Table 1. 92-item and 40-item Love Language Scale Subscale and Full Scale Item Descriptives

Scale	Mean	SD	SE	Range
40-Item Version				
WAF40	4.09	.50	.04	2.88
AOS40	3.58	.58	.04	3.38
GIF40	3.59	.56	.04	3.00
PAF40	4.09	.57	.04	2.50
QAT40	4.32	.42	.03	2.00
Full Scale	3.93	.38	.03	2.03
36-Item Version				
WAF36	4.09	.50	.04	2.88
AOS36	3.52	.62	.05	3.57
GIF36	3.73	.61	.05	2.83
PAF36	4.09	.57	.04	2.50
QAT36	4.38	.45	.03	2.00
Full Scale	3.98	.39	.03	2.14

Note. $N > 5^2$. WAF > Words of Affirmation, AOS > Acts of Service, GIF > Gifts, PAF > Physical Affection, QAT > Quality Time.

Method

Participants

The participants were primarily 185 undergraduate students at a small Midwestern Catholic college (138 women, 47 men, mean age = 21.1 years, age range 18-57 years), recruited through both introductory psychology courses and social networking sites. Some older adults also participated in response to social networking solicitations and were retained in the sample. The sample was 91.5% White, 1.3% Asian, 3.4% Hispanic, 0.4% Native American, 0.4% Black, 1.7% Biracial, and 1.3% Other. Undergraduate participants were awarded extra credit for completing the questionnaire.

Materials and Item Generation

The scale constructed by the research team was included in an online screening packet containing questionnaires pertinent to two related studies of the five love languages. The results of the second study are currently being analyzed (Cook, Pasely, Pellarin, Medow, & Baltz, 2013). Items on the love language scale were written collaboratively among a team of six researchers who discussed proposed items and included only those items receiving consensus regarding their appropriateness to a given love language construct. A 5-point Likert scale was utilized with a total of 8 items per love language for 40 items total. Our final sample of 163 participants with complete datasets satisfied the recommended 3:1 ratio for questionnaires with 50 items or fewer (Gorsuch, 1997).

Procedure

Participants completed informed consent and screening packets online. Data were collected via SurveyMonkey.com, downloaded in Excel format, and imported into and analyzed using SPSS 19. Notice of participation was provided to instructors as appropriate to facilitate awarding of extra credit.

Results

40-Item Love Language Scale Initial Reliabilities and Factor Structure

Screening packets provided a total of 185 completed love language scales but missing data

reduced the usable sample from 185 to 163. Completed datasets were subjected to reliability analyses for the full 40-item scale, as well as the five 8-item subscales. The n values for demographics and some subscales vary due to non-systematic missing data.

Although initial Cronbach's α values suggest that the subscale and full scale scores reached acceptable levels of reliability (all α 's > .70), four items demonstrated item-total correlations below $r = .30$ and were subsequently dropped from the scales. Items were correlated with the total scale score in order to reflect that while five separate love languages are hypothesized, all items should intercorrelate to at least a moderate degree, reflecting a general "love" construct. The resulting 36-item full scale was subject to additional reliability and confirmatory factor analyses. Scale item descriptives for the 36-item and original 40-item versions of the full scale and five subscales can be found in Table 1. Reliabilities and item descriptives for the five love language subscales and the 36-item full scale can be found in Table 2. Subscale reliabilities are all in the acceptable range and the full scale reliability is quite strong ($\alpha = .88$), with no items loading below .30 on any scale.

36-item Love Language Scale Reliability and Confirmatory Factor Analysis

Given our a priori hypothesis that five distinct love languages exist, we conducted a confirmatory principal components factor analyses utilizing a varimax rotation in order to maximize the theorized orthogonality of the underlying five factors. Eigenvalues for the initial and rotated factor structures can be found in Table 3 and specific item factor loadings and structure can be found in Table 4. Cross-loading was permitted where theoretical legitimacy warranted items loading on more than one factor. Correlation and covariance matrices are not presented here due to space constraints, but factor correlations can be found in Table 5.

The factors produced did not strictly correspond to the five languages defined by Chapman's theory (1992), but discernible patterns of affectionate styles did emerge. The strongest factor included items from all hypothesized languages,

Table 2. *Descriptives and Reliabilities for Initial Love Language Subscales and Scales*

Scale /Item	Mean	SD	N	Item-Total Correlation	Cronbach's α
Words of Affirmation	4.09	.50	172	-	.73
WAF1	4.23	.79	163	.47	
WAF2	4.31	.70	-	.39	
WAF3	3.62	1.10	-	.35	
WAF4	3.96	.97	-	.44	
WAF5	4.28	.77	-	.31	
WAF6	4.07	.84	-	.32	
WAF7	4.13	.86	-	.47	
WAF8	4.03	.80	-	.43	
Acts of Service	3.58	.58	170	-	.71
AOS1	3.81	1.03	163	.37	
AOS2	3.36	.99	-	.47	
AOS3	3.94	.86	-	.28	
AOS4	3.14	1.11	-	.33	
AOS5	3.30	1.02	-	.33	
AOS6	4.05	.82	-	.45	
AOS7	3.29	1.11	-	.42	
AOS8	3.48	.93	-	.37	
Gifts	3.59	.56	170	-	.75
GIF1	3.31	1.06	163	.25	
GIF2	3.06	1.00	-	.29	
GIF3	3.89	.83	-	.44	
GIF4	3.47	1.00	-	.39	
GIF5	3.81	.91	-	.44	
GIF6	4.06	.80	-	.49	
GIF7	3.60	.91	-	.44	
GIF8	3.47	.97	-	.32	
Physical Affection	4.09	.57	172	-	.79
PAF1	4.67	.60	163	.30	
PAF2	3.85	.98	-	.35	
PAF3	3.97	.91	-	.35	
PAF4	4.20	.83	-	.38	
PAF5	4.09	.96	-	.43	
PAF6	4.05	.97	-	.38	
PAF7	3.88	1.01	-	.35	
PAF8	3.90	.95	-	.39	

Table 2. *Continued*

Scale /Item	Mean	SD	N	Item-Total Correlation	Cronbach's α
Quality Time	4.32	.42	171	-	.74
QAT1	4.54	.68	163	.34	
QAT2	3.86	.87	-	.28	
QAT3	4.21	.84	-	.41	
QAT4	4.48	.63	-	.53	
QAT5	4.76	.50	-	.44	
QAT6	4.34	.71	-	.39	
QAT7	4.37	.61	-	.47	
QAT8	4.10	.73	-	.42	
40-Item Full Scale	3.93	.38	163	-	.88
36-Item Full Scale	3.98	.39	163	-	.88

Note. The item-specific N includes the total sample in the 40-item scale reliability analysis. Boldface items were

Table 3. *Eigenvalues and Total Variance Explained by Five Factors for the Revised 92-item Love Language Questionnaire CFA*

Factor	Initial Eigenvalues			Sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.427	20.631	20.631	3.992	11.089	11.089
2	3.094	8.595	29.226	3.572	9.921	21.010
3	2.085	5.792	35.017	3.303	9.174	30.184
4	1.931	5.365	40.382	3.269	9.079	39.264
5	1.806	5.018	45.400	2.209	6.136	45.400

Note. CFA > confirmatory factor analysis

Table 4. *Confirmatory Factor Analysis Solutions With Varimax Rotation of the Revised 92-Item Love Language Questionnaire*

Item	SACL	INTL	QATL	SUPL	COML	Abbreviated item content
GIF7LS	.711					gave thoughtful present
GIF6LS	.701					makes something special
GIF5LS	.701					gift made them think of you
GIF3LS	.692					surprise gift on desk

Table 4. *Continued*

Item	SACL	INTL	QATL	SUPL	COML	Abbreviated item content
GIF4LS	.566					buys me dinner
QAT7LS	.513					arranged special date
WAF8LS	.458					complimented appearance
WAF7LS	.422	.400				often tells of love
AOS6LS	.407		.300	.317		drove to pick up from work
PAF2LS		.761				kisses throughout day
PAF3LS		.681				deep romantic kiss
PAF6LS		.647				cuddles on couch
PAF7LS		.615				holds hands when out
PAF4LS		.587				puts arm around
WAF3LS		.516				terms of endearment
PAF1LS		.461	.340			hug after long tiring day
QAT3LS			.738			wants to go on long walk
QAT1LS			.642			talk about important for hours
QAT5LS			.633			listens when need to talk
QAT6LS		.335	.613			spends time alone w/o asked
QAT4LS	.360		.522			makes special trip to see
QAT8LS			.515			joins for a sit down meal
AOS1LS	.319		.324			chooses to help when busy
WAF5LS				.615		encouraged after failing
AOS2LS				.600		brought materials for project
AOS8LS				.568	.397	helped study for a test
AOS7LS				.539		takes out the trash
WAF6LS				.513		encourages when challenged
AOS4LS				.512		helps clean room
WAF1LS				.508		reassures when discouraged
AOS5LS				.507	.332	proofreads paper
WAF2LS				.483		compliments a job well done

Table 4. *Continued*

Item	SACL	INTL	QATL	SUPL	COML	Abbreviated item content
WAF4LS	.331			.359		shows pride in front of others
PAF8LS					.809	gives a back rub
PAF5LS					.756	gives a massage
GIF8LS	.385				.425	buys tickets for a concert

Note. Items loading at less than .744 omitted. SACL > Sacrificial Love, INTL > Intimate Love, QATL > Quality Time Love, SUPL = Supportive Love, COML = Comforting Love

Table 5. *Factor Correlations for the 92-Item Love Language Scale*

Scale		SACL	INTL	QATL	SUPL	COML
INTL	Pearson Correlation	.41*	--			
	N	180				
QATL	Pearson Correlation	.59*	.53*	--		
	N	180	180			
SUPL	Pearson Correlation	.61*	.29*	.47*	--	
	N	180	180	180		
COML	Pearson Correlation	.46*	.24*	.31*	.59*	--
	N	178	178	178	178	

Note. SACL > Sacrificial Love, INTL > Intimate Love, QATL > Quality Time Love, SUPL > Supportive Love, COML > Comforting Love

**p* < .001.

appearing to represent a “sacrificial” love language. The items loading on this factor displayed a pattern of sacrifice of time, energy, and affection. The second strongest factor appeared to be comprised of items reflecting “intimate” love, including both physical/affectionate and verbal intimacy. The third factor appears to represent quality time, with items reflecting meaningful forms of time spent together. The fourth factor was heavily loaded acts of service and words of affirmation; due to the high number of items involving helping, encouraging, or loving actions/words under distressing circumstances, this factor appeared indicative of “supportive” love. The fifth and weakest factor

comprised of the fewest items, suggested a “comforting/protecting” love factor, with items demonstrating common loving acts for college students during a period of stress, specifically academic help (reviewing a paper) and physical nurturance (giving massages). In summary, results suggest that rather than the five languages purported by Chapman (1992), love languages in this population take the forms of sacrificial, intimate, quality time, supportive, and comforting love.

Even though no hypothesized effects of sex were predicted, exploratory post-hoc analyses indicated that women reported significantly higher preferences for the gifts, quality time, and words of

affirmation languages in the original 36-item questionnaire (all $ps < .05$), and there were no sex differences in preferences for the physical affection and acts of service languages.

Discussion

This study intended to develop a questionnaire assessing the empirical validity of the love language constructs advocated by Chapman (1992) and others. Results suggest that rather than the five languages purported by Chapman, love languages demonstrated in this study take the forms of sacrificial, intimate, quality time, supportive, and comforting love. This factor structure differs from that demonstrated in Egbert and Polk (2006), but this discrepancy must be qualified by the fact that the factor structure derived here accounted for a relatively small proportion of the variance in scores (45.4%), suggesting a poor model fit and weak replicability relative to Egbert and Polk's findings. Further, the unexpectedly high intercorrelation of the factors contributes to the finding that orthogonal rotation added literally nothing to the variance accounted for by the five-language model. Consequently, our effort to strengthen the empirical support or refutation of Chapman's asserted number and independence of languages is equivocal at best.

Despite this shortcoming, our findings suggest that the love styles demonstrated here may in part reflect the agapic (sacrificial), erotic (intimate), and filial (supportive) forms of love previously advocated by Lee (1977, as cited in Hahn & Blass, 1997) and by ancient Greek philosophers. Additionally, many students at the college from which the sample was drawn may have been familiar with the three forms of human love discussed above (agapic, erotic, filial), which are often discussed in the theology and philosophy courses populating the general education curriculum, and this familiarity may have guided their response to the items rather than an assessment of their more personal preferences. Further, this population may have perspectives on romantic love and affection influenced by strong religious beliefs and constraints.

More specifically, the population of undergraduate students sampled is distinct in several ways from the modern dating culture; the college

atmosphere consists of extreme prudence in dating relationships, with an emphasis on sexual chastity, thoughtful selection of dating partners as potential spouses, group dating in preference to individual dating, and an arguably more mature, serious attitude toward and construal of the purpose of dating than is characteristic of most undergraduates. Therefore sampling a population with a variety of religious influences and practices would have contributed substantially to our external validity. An extended population could also contribute by including participants within longer-term relationships, as well as more experienced in domains of physical touch largely constricted in our sample. Similarly, an ideal population for our study would also have included love-language naïve high school students from the local area, and possibly an extension to married persons unfamiliar with the love language constructs.

The factor analysis provides potential insight into the different forms of love and how the meaning of a particular action may be interpreted differently depending on an individual's more pressing needs at the time. This is evidenced by the finding that some items loaded strongly on multiple factors, but quite possibly for different reasons; items construed as one love language, such as acts of service, may have loaded on quality time, indicating that the action is meaningful and appreciated for a variety of reasons and can affect individuals' experience of feeling loved on different levels. Chapman's (1992) theory struggles to explain how people may express or receive love according to two or more languages, especially in different relationships. Our factors generally support the case for specific types of love within a romantic relationship, but these types are affected by individual preferences, as well as perception of those actions varying according to immediate needs.

The results of this study in comparison to Polk and Egbert (2006) also suggest that expression and experience of love may be inherently difficult phenomena to operationalize. Due to their apparently diverse nature, even a singular definition with strong consensus among researchers could produce highly variable results when applied. Chapman (1992) attempts to categorize love expressions into one of five languages, but one of the apparent difficulties in this is connecting an ex-

pression of love to only a single language, and even then, creating universalized behavioral examples or scenarios exemplifying that single language. With the wide diversity of expression in affection demonstrated here and elsewhere in the literature, not to mention the demonstrated variability in types of human love in general, it is quite probable that generating a reliable, empirically robust categorical organization of love languages may be untenable.

Limitations and Future Directions

The study had multiple limitations worthy of note, particularly in the domains of generalizability of our findings and construct bias in the sample. The sample size acquired in this one-semester class project, while reflecting the campus demographics well, was only marginally adequate for validation of an instrument (Gorsuch, 1997). Further, the low percentage of variance accounted for by our model suggests our items regarding whatever love languages may exist were inadequate to capture the phenomena. Generalizability is further limited in that the population of the institution is approximately 85% Catholic and White, and thus our findings may not reflect those of a more theologically, experientially, culturally and morally diverse population. Further, previous exposure to the love languages through classroom discussions and on-campus relationship/courting programs sponsored by the college may have tainted student responding, a factor which was not addressed in our assessment and therefore cannot be ruled out. Lastly, post-hoc analyses suggesting some gender differences in preference for certain languages also warrants detailed exploration in future studies.

Given the importance and obligation of psychological science in enriching our empirically supported understanding of human functioning, it seems relevant to explore further the legitimacy of Chapman's love language constructs. His work appears to have generated a large and arguably profitable following, and popular assertions such as his regarding the central human experience of love most certainly warrant scientific exploration and, if the data require it, refutation. A crucial and as yet unsuccessful first step should be producing and validating a questionnaire accurately and reliably assessing the love languages, and subsequently

determining whether the languages proposed by Chapman (1992) can be generalized to the broader human population. Further, given Chapman has already developed and marketed extensive marital counseling, child-rearing, and other self-help materials (Jan. 2013, Retrieved from <http://www.5lovelanguages.com/resources/books/>), our ethical obligation to promote legitimate science suggests validation of his underlying constructs is overdue, especially given that they are already being packaged and sold to lovelorn singles, couples and even parents in distress as to how to best love their children.

It is notable that the five love languages website provides online questionnaires for single and married males and females, and solicitation of results of these assessments may be the most direct action. The authors here received no response in our requests to access that data, but perhaps more persistence investigators may be more successful. Utilizing an instrument and format advocated by Chapman himself may provide the best evidence for the legitimacy of his constructs, with important implications for the notion of love languages in general. Once demonstrated, researchers should then turn to investigating the utility of the constructs in fostering and maintaining love relationships, arguably the most important relationships human experience.

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Alcohol Consumption: American versus Indian Undergraduate College Students

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Abstract—College students differ widely in their reasons for consuming alcohol and other drinking related activities; relevant factors include personality, the environment, and personal history with alcohol (Kuntsche, Wiers, Janssen, & Gmel, 2010). The current study examined an additional factor: cultural differences between citizens of the U.S. versus Asian Indians. Results showed no cultural influences in the use of alcohol as related to depression, anxiety, and suicidal thoughts. However, main effects of both culture and situation (happy versus sad situations) emerged for self-reported drinking motives such as desire to consume alcohol for drug effects, to assuage fears, and to increase one's social assertion. Among other implications, understanding diverse motives for drinking alcohol can help to decrease high-risk drinking patterns among college students (Martens, Rocha, Martin, & Serrao, 2008).

Keywords: Alcohol, drinking motives, culture, Asian Indians

"Culture is the arts elevated to a set of beliefs."

Thomas Wolfe (U.S.A.)

"Culture of the mind must be subservient to the heart."

Mahatma Gandhi (India)

Every country has different sets of beliefs and rules regulating the life of its citizens. Our behaviors are shaped and influenced by the society in which we live. In the same way, sociocultural expectations regulate the meaning of drinking alcohol. The United States and India have different cultural beliefs and considerations impacting thoughts on alcohol consumption, as well as propensity to drink (Dhaliwal, 2009). Students between the ages of 18 and 25 years are more likely to get involved in drinking related habits compared to other age groups, and colleges/universities are the places where they learn these habits most. Factors including sex, religion, and parental approval are some of the variables involved in students' decision to drink alcohol. The purpose of the current study was to further ex-

plore cultural influences on alcoholic drinking behaviors, specifically in the context of American (specifically, the United States of America) versus Indian influence.

Reasons and Motives for Drinking

College students differ widely in their reasons for consuming alcohol and their involvement in other drinking related activities (Dhaliwal, 2009). The decision to drink or not is the result of several factors, including personality characteristics, sociocultural factors, historical circumstances, environmental factors, situational and current factors, alcohol expectancies, and drinking motives. In short, the research has shown four main drinking motives including enhancement of a desired emotional state (e.g., increased happiness), coping with stress (e.g., avoidance), social motives (e.g., reduced inhibitions), and conformity (e.g., drinking at a party where everyone else is also drinking; Kuntsche, Wiers, Janssen, & Gmel, 2010). Motives lead to different patterns of alcohol consumption and alcohol-related problems; for example, enhancement motives are more associated with

binge drinking, whereas coping motives are more associated with alcoholism (Russell, Skinner, & Windle, 1992).

Along a similar line, college students may choose to drink either to obtain positive outcomes – such as being liked by peers – or to avoid negative consequences – such as being socially punished by one’s peers (Kuntsche et al., 2010). Both positive and negative reinforcing drinking motives have a direct relationship with alcohol use, but the negative reinforcing motives have stronger relationship with alcohol-related problems. Understanding motives for drinking alcohol can help decrease high-risk drinking among college students (Martens, Rocha, Martin, & Serrao, 2008). In order to fully understand college drinking, a backdrop of culture must be considered. There is a possibility that the motives for consuming alcohol and drinking behaviors are not similar all around the world. Factors predicting drinking behavior among American college students may not apply to Indian college students because of the different cultural beliefs, rituals, and traditional practices.

Drinking Behavior among American College Students

In the United States, drinking alcohol is openly considered normal in social contexts. Most Americans would consider consuming alcohol appropriate during parties, family gatherings, or just to relax while watching TV. The increasing use of alcohol in American culture is also impacting the young generation, despite the government having strict rules and taking several preventative measures to deal with the increasing problem of underage drinking. Regardless of the many policies intended to reduce alcohol consumption on college campuses, American college students are continuing to drink excessively and get involved in risky behaviors (Dhaliwal, 2009). More than 84% of American college students report engaging in alcohol-related activities and heavy drinking in order to experience more positive consequences, including meeting new friends, expressing themselves, and romantic encounters (Skidmore & Murphy, 2011). One of the possible reasons for this trend is that in American culture, self-reliance and independence are valued, and children are raised to believe in making their own decisions; thus, federal

or state laws are easily considered formalities to be ignored.

Drinking Behavior among Indian College Students

No two countries have the same cultures and different perceptions and expectations between American and Indian citizens are an example. Indian culture has never accepted alcohol as a part of normal social discourse or eating behavior, and there is a virtual absence of normative patterns of drinking alcohol and attitudes towards it (Vaswani, Ambekar, & Pattanayak, 2009). Like other Asian countries, India has been influenced by Western culture (e.g., during British occupation), but this influence has not been as great as it might have been. For example, despite the appearance of public bars and pubs in some parts of India, pub drinking, as understood in the West, has not yet been institutionalized and norms are only beginning to evolve (Vaswani et al., 2009).

Depression and Alcohol

Unfortunately, for many individuals around the world, alcohol consumption and depression are closely tied. The U.S. national survey of college students in 2002 showed both alcohol use and heavy episodic drinking were more likely in those students with higher levels of self-reported depression (National Center on Addiction and Substance Abuse, 2003; as in cited in Grant, Stewart, & Mohr, 2009). It is estimated that in the United States, up to 27% of students suffer from moderate or higher levels of depression and up to 13.8% have symptoms consistent with a diagnosis of major depressive disorder (Gonzalez, Reynolds, & Skewes, 2011). The data collected from these studies suggest suicidal thoughts and depression are major concerns in American colleges. According to this research, more than 80% of American college students indicated they had experienced depression since coming to college, 32% had experienced suicidal ideation, 4.5% had attempted suicide, and 1% had actually achieved suicide (Westefeld & Furr, 1987).

Unfortunately, there has not been a great deal of research conducted on Indian college students to determine if they experience depression at the same rate as American college students. One

study showed Indian students have higher self-esteem than American college students, and those individuals with higher self-esteem both do not feel the need to drink and are less likely to have depression (Dhaliwal, 2009). However, more research on the link between alcohol and culture is warranted. Based on the research reviewed above, the first hypothesis of the current study was that American college students will report more symptoms of depression compared to Indian college students.

Anxiety and Alcohol

Past research suggests depression and anxiety are associated with alcohol use in college students (Grant et al., 2009). However, the correlation between alcohol use and mental health is not a simple one. At least one study found small amounts of alcohol consumption can help to decrease anxiety and depression; however, higher amounts can increase anxiety and depression (Williams, 1966). This suggests alcohol does lower anxiety levels and gives a feeling of relaxation for a short-period of time. Unfortunately, it is possible that over time, a person can become dependent on alcohol to deal with stress and eventually build up a tolerance or even addiction, in order to get the same feeling of relaxation. According to Kushner, Abrams, and Borchardt (2000), anxiety and alcohol use have a reciprocal relationship in that anxiety stimulates alcohol use, and in turn alcohol can increase anxiety.

There is not much research on the Indian population measuring anxiety in college students. However, as mentioned above, in India drinking is not as accepted as it is the United States, resulting in less alcohol consumption in India. It is possible that due to less alcohol and higher levels of self-esteem, Indian college students experience less anxiety. Therefore, the second hypothesis was that American college students will report more symptoms of anxiety compared to Indian college students.

Depression and Suicidal Thoughts

The research discussed above provides evidence that, for many individuals, alcohol consumption has some relation with depression. This conclusion is supported by a survey conducted by the

Suicide Prevention Resources Center in 2004; the survey concluded alcohol is the second leading cause of death among college students in the United States (Suicide Prevention Resources Center, 2004, as cited in Lamis, Malone, Langhinrichesen-Rohling, & Ellis, 2010). Suicidal thoughts and depression are major concerns in American colleges. Some of the factors that might be responsible for suicidal thoughts and depression are loneliness, hopelessness, and parental problems (Westefeld & Furr, 1987).

Most of these studies, studying American college students, confirmed these students are prone to alcohol usage and are likely to suffer alcohol-related consequences. However, as stated above, very little research has been done in India to test whether these patterns exist there as well. There is reason to believe differences in culture between India and the U.S. will lead to different trends in suicidal symptoms. Some research shows that Indian college students feel closer to their families and more integrated into national culture, leading to higher self-esteem in general (Dhaliwal, 2009). Thus, the third hypothesis of current study was that American college students will report more suicidal thoughts as compared to Indian college students.

Interaction of Culture and Situation on Drinking Motives

To date, a great deal of research has been conducted regarding the influence of situational factors on drinking motives. For example, according to the motivational model of alcohol use, people drink based on the emotional effect they wish to achieve, rather than being driven solely by direct chemical effects or withdrawal avoidance (Cox & Klinger, 1988). The particular emotional effect desired may certainly depend on the situation at the time; for example, if an individual is in a situation with negative affect, he or she may drink as a way of either elevating mood or forgetting about the situation. Other researchers have suggested a similar association between the situation and drinking; Johnson, Hamilton, and Sheets (1999) noted motives for drinking are more based on individual differences in terms of expected outcomes than they are on drinking specifically to get drunk. Expected outcomes are variable, depending on the

particular drinking situation. Thus, it is reasonable to believe that under an experimental manipulation of situation, specifically regarding a positive/happy situation versus a negative/sad situation, drinking motives may change. This expectation was investigated in the current study.

In addition to the particular situation at hand, culture certainly has a major role in one's decision to consume alcohol or not. For instance, in American culture, drinking is accepted as normal and seen as appropriate under a wide variety of circumstances (Dhaliwal, 2009). In contrast, Indian culture accepts the appropriate time for alcohol use is to celebrate special events, such as moving into a new house, weddings, parties, etc. (Sharma, Tripathi, & Pelto, 2010). In other words, positive and happy celebrations are one of India's most significant predictors of alcohol use (Yeramaneni & Sharma, 2009). This pattern shows culture affects the way an individual interprets a given situation and decides what is appropriate to do or not to do in that particular situation.

As reviewed previously, much extant research has investigated either the role of situation on drinking motives or the role of culture on drinking motives. To date, however, little research has been conducted that integrates both of these variables simultaneously. If culture indeed influences perception of situational factors, a view of psychological motives to drink alcohol is not complete without this cultural backdrop. This paper thus contributes to existing literature on drinking motives in a significant way. Because few previous studies have combined all three variables (situation, culture, and drinking motives), no specific hypotheses were generated regarding how these variables would combine. However, the present study was guided by the following research question: Will situational effects (e.g., happy vs. sad situation) interact with culture (e.g., American vs. Indian) to influence self-reported drinking motives?

Method

Participants

Two groups of participants completed the survey. The first group was 72 undergraduate students (21 men, 51 women) attending a private university in the Midwestern United States. Partic-

ipants were recruited from psychology classes and were given extra credit for their participation. The demographic breakdown of the American participants was as follows: 83% Caucasian, 7% Asian, 3% Hispanic/Latino, 3% African American, and 4% missing or "other." The participants were also asked to write down the country of their permanent residence, and any participants who were not U.S. citizens were eliminated ($n = 0$).

The second group was 45 undergraduate students (27 men, 18 women) from India (all had Indian ethnicity). All Indian participants were recruited from a convenience sample of personal contacts of the authors. They were contacted through Facebook initially, and those who replied stating interest in the study were asked to provide their e-mail address in order to send them the online survey. Individuals who agreed to participate were also asked for additional personal contacts through email.

Procedure

All participants (American and Indian) individually received a website link. The first page of the website was a consent form; after clicking "yes," participants read a fictional scenario describing either a positive or negative situation (see below for details). They then completed all survey materials. After submitting the survey, participants viewed a debriefing screen explaining the nature of the study and providing contact information. The study was approved by the hosting university's Institutional Review Board for ethics.

Independent Variable: Happy vs. Sad Scenario

Participants from each sample were randomly assigned to read a fictional scenario in which the participant was asked to imagine receiving either with happy news or sad news (see the Appendix for the full descriptions). Other than these scenarios, the surveys were identical.

Dependent Variables

Depression. After reading the scenario, participants completed several scales. Depression was measured using the Kroenke, Spitzer, and Williams (2001) Depression Index. This scale is a 10-item self-report questionnaire listing various depression symptoms; participants respond using a

4-point Likert scale (0 = *not at all*, 1 = *several days*, 2 = *more than half the days*, and 3 = *nearly every day*) for first nine items. The last item had a different 4-point Likert scale, where participants indicated how difficult these symptoms had made their life (0 = *not difficult at all*, 1 = *somewhat difficult*, 2 = *very difficult*, and 3 = *extremely difficult*). Example items include, "*Little interest or pleasure in doing things*" and "*Feeling down, depressed, or hopeless*." All items are summed to obtain a total score in the possible range of 0-30. Higher scores reflect greater depressive severity. The mean of the current sample was 16.56 ($SD = 6.29$) and internal consistency for this scale was good in the current sample, $\alpha = 0.89$.

Anxiety. Anxiety was measured with a modified Hamilton anxiety rating scale (HAM-A; Hamilton, 1959). The original scale was intended for professionals to rate participants through the course of an interview; for the purposes of this study, we asked participants to rate themselves. The index is a 42-item self-report questionnaire listing anxiety symptoms; participants indicate their experience with each symptom using a 5-point Likert scale (0 = *absent*, 1 = *mild*, 2 = *moderate*, 3 = *severe*, and 4 = *incapacitating*). Example items include, "*Worries*" and "*Anticipates worst*." All items are summed to obtain a total score in the possible range of 0-168, with higher scores indicating more anxiety. The mean of the current sample was 60.47 ($SD = 19.63$) and internal consistency for this scale was good, $\alpha = 0.95$.

Suicidal thoughts. Suicidal thoughts were measured using the Osman et al. (1999) scale (SBQ-R scale). The scale contains four different questions with different rating scales. Participants are asked to select only one option from each item, which is assigned a number from 1-4. Example items include, "*Have you ever thought about or attempted to kill yourself*" and "*How often have you thought about killing yourself in the past year*." All items are summed to obtain a total score. The scores range from 4 to 16 and higher scores reflects greater suicidal thought severity. The mean of the current sample was 5.46 ($SD = 2.92$) and internal consistency for this scale was good, $\alpha = 0.85$.

Drinking motives. Reasons for drinking were measured using two scales. First, partici-

pants completed the Feldstein Ewing, Hendrickson, and Payne (2008) desired effect of drinking scale. Participants rank 37 items on a 4-point Likert scale ranging from 0 (*never*) to 3 (*always*) based on their reasoning. The scale includes eight subscales, including motives such as social facilitation, improving self-esteem, and sexual enhancement. Example items include, "*Drink to enjoy the taste*" and "*Drink to feel more creative*." Items are summed to create a composite score for each of the eight subscales, with higher numbers for each subscale indicating higher motivation on that subscale. The overall mean of the current sample was 52.88 ($SD = 5.81$) and internal consistency for the overall scale was good, $\alpha = 0.77$.

Drinking motives were also measured using the Cooper, Russell, Skinner, and Windle (1992) daily drinking questionnaire. Participants rated 15 items on a 4-point Likert scale ranging from 1 (*almost never/never*) to 4 (*almost always/always*) based on their motive for drinking. Example items include, "*As a way to celebrate*" and "*Because this is what most of your friends do when you get together*." Items are summed to create a composite score for each of the three subscales (social motives, coping motives, and enhancement motives), with higher numbers for each subscale indicating higher motivation on that subscale. The overall mean of the current sample was 25.08 ($SD = 11.41$) and internal consistency for the overall scale was good, $\alpha = 0.89$.

Results

Hypothesis 1

The first hypothesis expected American college students would report more symptoms of depression compared to Indian college students. There was not a significant difference between levels of depression in Americans ($M = 16.94$, $SD = 6.76$) compared to Indians ($M = 15.95$, $SD = 5.47$), $t(115) = .83$, $p > .85$. Thus, Hypothesis 1 was not supported.

Hypothesis 2

The second hypothesis expected American college students would report more symptoms of anxiety compared to Indian college students. There was not a significant difference between levels of anxiety in Americans ($M = 59.41$, $SD >$

Table. *Effects of Culture and Experimental Situation on Drinking Motives*

	Culture (Main Effect)		Situation (Main Effect)		Interaction	
	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>	<i>F</i>	<i>p</i>
Positive Feelings & Social Facilitation	5.52	0.02*	0.00	0.99	0.20	0.65
Negative Feelings/Self-Esteem	0.06	0.80	2.54	0.11	0.57	0.45
Sexual Enhancement	10.97	0.01*	0.04	0.83	0.01	0.99
Relief	0.20	0.65	1.73	0.19	1.99	0.16
Assertion	4.65	0.03*	9.07	0.01*	5.02	0.02*
Mental Health	7.91	0.01*	2.96	0.08	2.10	0.15
Drug Effects	5.92	0.02*	7.73	0.01*	5.04	0.03*
Fears	0.13	0.72	4.43	0.03*	3.37	0.06
Social Motives	1.68	0.19	1.32	0.25	0.44	0.50
Coping Motives	0.90	0.34	3.12	0.08	1.40	0.23
Enhancement	2.43	0.12	0.12	0.72	0.00	0.95

Note: In the table, * indicates statistically significant at $p < .05$

17.97) compared to Indians ($M = 62.15$, $SD = 22.13$), $t(115) = -.73$, $p > .80$. Thus, Hypothesis 6 was not supported.

Hypothesis 3

The third hypothesis expected American college students would report more suicidal thoughts as compared to Indian college students. Again, there was not a significant difference between suicidal thoughts in Americans ($M = 5.73$, $SD = 3.11$) compared to Indians ($M = 5.38$, $SD = 2.26$), $t(106) = .70$, $p > .82$. Thus, Hypothesis 7 was not supported.

Research Question: Situation and Drinking Motives

Finally, the current study investigated whether situational effects (happy vs. sad situation) would interact with culture (American vs. Indian) to influence self-reported drinking motives. For these analyses, two-way analyses of variance were conducted on each sub-scale for the two drinking motives surveys (DEoDS and DMQ). These ANOVAs included tests for the main effect of culture (America vs. India), the main effect of situa-

tion (happy vs. sad), and the interaction of these two variables. All F values and p -values can be seen in the Table. It is important to note no significant main effects or interactions were found for five of the drinking motives: Negative Feelings & Self-Esteem, Relief, Social Motives, Coping Motives, and General Enhancement.

Main effects of culture. Significant main effects of culture were found for five drinking motives. For "Positive Feelings & Social Facilitation," Americans were more likely to indicate this as a drinking motive ($M = 24.15$, $SD = 7.84$) compared to Indians ($M = 20.23$, $SD = 8.57$), $F(1, 110) = 5.52$, $p = .02$, $d > .80$. For "Sexual Enhancement," Indians were more likely to indicate this as a drinking motive ($M = 6.76$, $SD = 7.36$) compared to Americans ($M = 4.88$, $SD = 2.08$), $F(1, 110) = 10.97$, $p = .001$, $d = .60$. For "Assertion," again Indian students indicated a higher likelihood of using alcohol for this motive ($M = 5.21$, $SD = 6.29$) compared to American students ($M = 4.36$, $SD = 1.20$), $F(1, 110) = 4.65$, $p = .03$, $d > .73$. Indian students also responded they use alcohol to improve their "Mental Health" ($M = 2.57$, $SD = 5.79$) more than American students ($M = 2.10$, $SD = .30$), $F(1, 110) = 7.91$, $p = .006$, $d > .82$.

Finally, Indian college students were more likely to indicate drinking alcohol for its "Drug Effects" ($M = 3.88$, $SD > 5.39$) compared to American college students ($M = 3.26$, $SD = .60$), $F(1, 110) = 5.92$, $p = .02$, $d = .43$.

In sum, Americans were more likely than Indians to use alcohol for positive feelings and social facilitation. However, Indian students indicated being more likely than Americans to use alcohol for sexual enhancement, help in social assertion, to improve mental health, and for its drug effects.

Main effects of situation. Significant main effects of experimental situation (happy versus sad) were found for three drinking motives. Across both cultures, students indicated being more likely to drink for "Assertion" in the sad situation ($M = 5.16$, $SD > 6.19$) than in the happy situation ($M = 4.22$, $SD = 2.85$), $F(1, 110) = 9.07$, $p = .003$, $d > .78$. Similarly, students indicated being more likely to drink for alcohol's "Drug Effects" in the sad situation ($M = 3.78$, $SD > 5.16$) than in the happy situation ($M = 3.22$, $SD = .65$), $F(1, 110) = 7.73$, $p = .006$, $d > .87$. Finally, the pattern continued with students reporting greater likelihood of alcohol use to assuage "Fears" in the sad situation ($M = 1.27$, $SD = .65$) than in the happy situation ($M = 1.10$, $SD = .40$), $F(1, 110) = 4.43$, $p = .03$, $d = .32$.

In sum, regardless of culture, the participants in this study indicated that when in the sad situation (compared to the happy situation), they were more likely to drink alcohol to gain social assertion, for alcohol's drug effects, and to assuage fears.

Interactions. Finally, two significant interactions emerged. The first was for the "Assertion" drinking motive, $F(1, 110) = 5.02$, $p = .02$. When split by both culture and situation, American college students indicated they were slightly more likely to drink in the sad situation ($M = 4.52$, $SD > 5.00$) than the happy situation ($M = 4.23$, $SD > .92$). Although Indian students showed this same basic pattern, the disparity between the sad situation ($M = 6.14$, $SD > 7.02$) and the happy situation ($M = 4.20$, $SD > .14$) was much larger. Indeed, examination of the means reveals the combination of Indian culture and a sad situation is what drives this interaction effect.

The same pattern was seen in the interaction for "Drug Effects," $F(1, 110) = 5.04$, $p > .47$. As

before, Americans were slightly more likely to indicate they would drink for drug effects in the sad situation ($M = 3.33$, $SD > 7.64$) compared to the happy situation ($M = 3.20$, $SD > .05$). However, the difference between situations was larger for Indians, who reported being significantly more likely to drink for drug effects in the sad situation ($M = 4.45$, $SD > 6.94$) compared to the happy situation ($M = 3.25$, $SD > .16$). Both of these interactions indicate Indian students are more effected by the environmental situation than are American students, at least for these two specific possible motives for drinking alcohol.

Discussion

To date, very little published research has directly compared drinking motives between Indian and American college students who are living in their native countries. This study was an attempt to explore cultural and situational influences on alcoholic drinking motives. Surprisingly, the first three hypotheses did not find support in the results. The reason might be the impact of Western culture on Indian culture. Since the British colonized India, Indian citizens and culture have been hugely impacted by Western beliefs and practices. This is perhaps an even stronger influence in the modern world, due to the ease of communication and exposure to Western beliefs via movies, television, and the Internet.

In spite of the growing similarities between American and Indian culture, comparisons of self-reported drinking motives did result in some significant effects. American college students reported being more likely than Indian students to use alcohol to increase positive feelings and for general social facilitation; the drinking culture on many American colleges and universities likely contributes to these trends. In contrast, Indian students reported being more likely to turn to alcohol for sexual enhancement, help in social assertion, to improve mental health, and for its drug effects. The difference in drinking motives by culture indicates one's country of origin and upbringing do influence the way one perceives the uses (and, perhaps, misuses) of alcohol. Universities might, therefore, desire to keep culture and diversity in mind when designing training and education programs for incoming and current students at their institutions.

Experimental situation (happy versus sad) also had a small influence on self-reported drinking motives. Recall that regardless of culture, participants indicated that when in the sad situation, they were more likely to drink alcohol to gain social assertion, for alcohol's drug effects, and to assuage fears. No other significant drinking motives showed significance when comparing the happy scene to the sad scene. At least with these participants and in these specific situations, it seems people are more likely to use alcohol to avoid negative affect instead of to enhance positive affect.

However, all of these main effects must be interpreted within the interaction of culture and situation. Two drinking motives showed a significant interaction effect: using alcohol for its drug effects and using it to increase social assertion. The Indian sample in the current study was more likely to make distinctions between the happy and sad situation for these motives, compared to the American sample. In other words, the American sample was less likely to change their expected behaviors based on the situation. Perhaps American college students expect to use alcohol more regularly, regardless of situation, due to the general acceptance of alcohol consumption in the U.S. on a more general level.

Limitations and Future Research

The current study had several limitations. First, no pilot testing or manipulation check was completed on the fictional scenarios. It is possible the scenarios were not strong enough to compel participants to imagine themselves in the situation, or the scenarios were not interpreted as positively or negatively as the experimenters desired. Future research could replicate this study, but in a procedurally stronger manner, by ensuring the fictional scenarios were truly causing effect desired. In addition, the scenarios may have added confounding variables without intention. For example the sad scenario specifies, "There is nobody you can talk to." Perhaps this social isolation influenced the perceived situation more than the simple happy versus sad nature of the scenarios. Both scenarios used a study abroad situation; although this variable is thus not experimentally problematic, it implies additional social anxiety, angst, etc. which might also affect drinking motives. Additional re-

search should be careful to create manipulation checks and experimental materials to control these variables more specifically.

The second limitation is that Indian sample was a convenience sample of people personally known to the first author. Even though participants were told the online survey was completely anonymous, there is still a possibility participants thought they might be judged by the experimenter for their honest responses. Social desirability in Indian culture is such that many Indians do not like to admit their drinking habits with others because of the fear of being judged. Thus, future research might benefit from using a truly random sample of college students, to avoid these social desirability concerns.

Third, certain demographic considerations may have affected the results and how generalizable they are to a larger population. The categories of "Americans" (or citizens of the United States) and "Indians" are hugely broad and inclusive of many diverse types of people. For example, "Indian" could include Hindu people, Jain, Buddhist, Sikh, and more, not to mention the now illegal but still culturally relevant concept of the caste system. The current survey did not extensively measure these important demographic variables, and thus inferences about how different types of "Americans" or "Indians" view alcohol should not be made broadly. In addition, the American sample was essentially twice as many women whereas the Indian sample was essentially twice as many men. Religion, subculture, ethnicity, and gender are all variables that may very likely have additional influence on an individual's use and perception of alcohol.

Finally, this study only investigated self-reported expectations of drinking behavior, and not *actual* drinking behavior. Previous research had shown that among Indian college students, the decision of whether to consume alcohol or not is based on the combined effect of convictions, beliefs, and feelings one has developed towards drugs and alcohol (Girija & Bhadra, 1983). There are a variety of culturally specific influences mediating alcohol consumption in India; these include family influences, education, socioeconomic status, gender, and religion. There is currently not enough research to specify the rate of alcohol consump-

tion, and its related problems, amongst Indian college students (Dhaliwal, 2009), but the research done on Asian Indian students (i.e., not Native American Indians) in the United States shows the rate of alcohol use in Indian students is less, compared to other Asian Americans and to Caucasian American college students (Khosla, Thankappan, Mini, & Sarma, 2008). There is not much research directly comparing amount of alcohol consumption among Indian and American college students who are living in their native countries. Future research should compare the actual amount of alcohol consumed between Indian and American populations, in addition to the drinking motives assessed in the current study. It would also be interesting to measure sex differences in consuming alcohol and drinking motives. According to at least two studies (Bergmark & Kuendig, 2008; Gross, 1993), men consume more alcohol compared to women. This sex difference has not yet been tested on an Indian population.

Conclusion

The main motive of this study was to learn about different reasons for consuming alcohol among American and Indian college students. There is a possibility the factors that predict drinking behavior among American college students might not be applied to Indian college students because of their different cultural beliefs, rituals, and traditional practices; several main effects and interactions including cultural influences did emerge. Although this study was a good beginning to address these questions, more research is warranted. The current study is important because it will help to begin the process of understanding the motives and factors influencing college students of different cultures to engage in drinking related habits. Understanding differences can help to develop prevention programs, diagnostics, and treatment interventions, as well as overall alcohol policies that are appropriate for a particular country.

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Appendix: Happy vs. Sad Fictional Scenario

Read the scenario below and try to imagine that this is happening to you. Imagine that the "you" below really is you. How would you act and think in this situation?

Happy Scenario

You got a brilliant opportunity to study abroad in London for a year. For your bright future you accept that opportunity and decide to spend one year in London. On the very first day you arrive in Lon-

don, everything looks awesome. You go to your college and a couple of the authority people are there to welcome you.

Then, you go to your dorm room and after a while your roommate comes to the room. Both of you introduce yourself to each other and after talking for a while, your roommate invites you for a party. You decided to go with your roommate. As you reach the party, you see everyone is enjoying themselves, drinking, and dancing. Your roommate gets busy with his/her friends. You are standing alone and looking at people around. In a while, you got a phone call from home and you come to know that your father just won a very big lottery.

Sad Scenario

You got a brilliant opportunity to study abroad in London for a year. For your bright future you accept that opportunity and decide to spend one year in London. On the very first day you arrive in London, everything looks awesome. You go to your college and a couple of the authority people are there to welcome you.

Then, you go to your dorm room and after a while your roommate comes to the room. Both of you introduce yourself to each other and after talking for a while, your roommate invites you for a party. You decide to go with your roommate. As you reach the party, you see everyone is enjoying themselves, drinking, and dancing. Your roommate gets busy with his/her friends. You are standing alone and looking at people around. In a while, you got a phone call from home and you come to know that someone close to you has died. There is nobody you can talk to, and you can't go back to your college room because your roommate is busy, and you don't know the way back.

"Wow, you're good": Effects of Positive and Negative Feedback on Videogame Performance

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Abstract—The purpose of this study was to examine the effect of feedback on videogame performance. Participants either received positive or negative feedback from a researcher while playing a spatial-reasoning videogame. A 2 (sex of participant: men and women) x 2 (feedback: positive and negative) ANOVA revealed multiple significant findings. A significant interaction and post hoc analyses revealed men performed similarly when given positive or negative feedback, whereas women performed at a lower rate with negative feedback. Men outperformed women overall, and positive feedback elicited better performance than negative feedback.

Keywords: Feedback, performance, sex differences, videogames

Feedback for motivational purposes is used in many aspects of life, both in a negative and positive manner; however, different groups of people respond differently to the types of feedback they receive. Gershgoren, Tenenbaum, Gershgoren, and Eklund (2011) had parents provide ego-oriented or task-oriented feedback to their children during soccer penalty shootout scenarios. These researchers discovered parents who gave positive versus no feedback (i.e., cheering, clapping, shouting words of encouragement) to their children during an athletic event motivated their children to perform at a higher rate. Parents did not give negative feedback in this study. Gershgoren et al. found the use of positive feedback on individuals had a true impact on performance during athletic events. It is apparent, based upon Gershgoren's findings, positive feedback can be seen as a factor for enhancing performance.

Murthy and Schafer (2011) expanded beyond the use of only positive feedback and hypothesized there would be significant differences in individuals' responses to positive feedback, negative feedback, and controlled (unframed) feedback. The researchers had participants work in a research lab on decoding numbers into letters. While decoding, individuals received each of the three aforementioned types of feedback on a computer

screen. After the decoding task, participants were able to rate which type of feedback they found to be most useful. Researchers found no effect of type of feedback on performance; however, positively-framed feedback was rated much more desirable as compared to negatively-framed feedback.

Recognizing the impact of feedback in interacting with colleagues, Barton, Kinder, Casey, and Artman (2011) examined how teachers used a "Finding Your Feedback Fit Tool" to discover which type of feedback they should give other teachers/administrators in order to maximize their time and efforts both during and after meetings. This feedback tool consisted of a collection of short questionnaires given to teachers/administrators regarding different feedback methods available. The feedback tool contained multiple types of feedback (in packet-form) the teacher could read about, in detail, and then selected which types they preferred. From their research, Barton and colleagues found teachers who used positive feedback (general positive statement) witnessed higher performance levels (i.e., less time spent emailing, more work completed, etc.) both during and after their meetings. By using the "Finding Your Feedback Fit Tool," teachers were able to hone in on how important positive feedback was for their interactions with colleagues.

Bloom (2009) similarly found the beneficial impact of positive feedback in a work setting. Participants played a company-designed videogame while training in order to help them learn more about what was expected from them for their position. Positive feedback (i.e. verbal encouragement and level completion during game play) was provided while the participants navigated their way through different levels. The game was a virtual heavy machinery-driving simulator. An important concept discussed by this author was how many videogames provide positive feedback during simple game play. Bloom argued videogames have a 'hang-in-there' mentality already incorporated in them to keep individuals motivated during game play. This mental phenomenon suggests individuals who play videogames will likely want to continue to keep trying due to the constant 'hang-in-there' reinforcement. In Bloom's research, individuals who received positive feedback during game play retained information at a much higher level than those who received traditional training sessions (lectures, PowerPoint, etc.). These findings provide further evidence for how positive feedback can be given to increase retention/performance levels. There is also research suggesting negative feedback can be just as, if not more, effective than positive feedback.

Cianci, Klein, and Seijts (2010) discovered performance levels rose when participants received negative feedback. Their study focused on giving participants a "learning goal" in regards to how to approach a task. Researchers asked participants to accomplish the goal, receive some sort of negative feedback, and then accomplish the same goal again. Negative feedback included verbal prompts from superiors, as well as written responses, on how individuals performed. Participants were told they, "performed very poorly on the task," as well as, "the average score on this task for [name of university] students is 95%. Your individual score on this task, rounded to the nearest 5%, is 60%" (Cianci et al., 2010, p. 622). All individuals acknowledged thoughts of tension, anxiety, or frustration. The researchers found negative feedback, after assigning a "learning goal," led to participants performing at a higher level, as compared to the first time they completed the task. Upon further review of this study, it is evident negative

POSTIVE AND NEGATIVE FEEDBACK

feedback can be beneficial in certain instances.

In further support for negative feedback being valuable, Rivera (2010) found frequent negative feedback or constructive criticism (i.e., "Your performance was poor," "You performed below average," "You did not consider the other person's position. As a result, you did not solve the problem or build a relationship with the local") and infrequent positive feedback (i.e., "Good work." "You performed better than average." "You exhibited a 'win-win' negotiation strategy." "You considered the interests of both parties and worked towards finding a solution") beneficial for trainee performances. The individuals were trained to complete videogame-based missions in a computer game. Interactions and agreements with certain "locals" made up the missions/objectives in the game. After implementation of the videogame-based training, researchers found participants who received negative feedback performed at a higher rate during trainee performances than those who received positive feedback.

Clearly a great deal of research on feedback exists, but the present study also keyed in on sex differences in terms of spatial reasoning. A study by Law, Pellegrino, and Hunt (1993) researched if sex differences were apparent in participants who completed a spatial reasoning task. Participants in the study were told to observe two different objects: one of which traveled at a 29.1 mm/s rate, the other of which traveled at a rate of either 29.1 mm/s, 19.2 mm/s, or 14.6 mm/s (Law, et al., 1993). Participants were asked which object was traveling at a faster rate, or if the two objects were traveling at the same rate. Law and colleagues found a significant sex difference with men being more sensitive to relative velocity compared to women. This finding indicates men perform better than women in regards to spatial reasoning tasks.

Based on the previous research, the concept was formulated that types of feedback can be more or less beneficial to different types of people. By tying the feedback articles in with the sex differences article, the researcher concluded men may respond differently than women when posed with various types of feedback. The purpose of the present study was to examine how men and women responded differently to positive and negative feedback during a videogame, which required spa-

tial-reasoning. It was hypothesized: a) positive feedback would result in better performance overall, b) men would outperform women, because the task required spatial reasoning skills (see Linn & Peterson, 1985; Voyer, Voyer, & Bryden, 1995 for review of sex differences in spatial reasoning), and finally, c) men would respond more favorably to negative feedback whereas women would perform at better levels when given positive feedback.

Method

Participants

Thirty-three (26 men, 7 women) volunteers from a small, Midwest, private, Liberal-arts College participated. The study was approved by the hosting university's IRB. Multiple participants were members of a General Psychology class, and received research credit for participating in this study. All of the 33 individuals who participated in the study were Caucasian. Individuals signed informed consent prior to participation in the study. All participants were treated in accordance with the APA Code of Ethics (APA, 2002).

Materials

A spatial reasoning videogame, Boom Blox (Boom Blox, 2008), was the game of choice during the study. Boom Blox is rated E for Everyone and is designed to test individuals' spatial reasoning by requiring them to throw and knock down blocks with the Wii remote. Participants played the game on a Wii videogame console connected to a 37-inch Sony TV. All participants had previously played a Wii and knew how to control the remote. During game play, individuals had to pass certain levels by throwing balls (with the Wii remote) at an array of blocks, consequently knocking them to the ground. Participants received either a gold, silver, or bronze medal depending on number of throws used (fewer throws means a better medal). Individuals received three points for a gold medal, two points for a silver medal, and one point for a bronze medal. All medals were totaled and given a sum score once the study was completed.

During video game play, participants heard either positive or negative feedback. One male researcher provided feedback for all participants. The positive prompts were: "Nicely done" at the 2 and 5 minute mark, "You're blowing through this

game with ease" at the 10 minute mark, "You are dominating this game so far, keep it up" at the 20 minute mark, and "Wow, you're good!" at the 15 and 25 minute mark. The negative prompts included: "That wasn't a smart throw" at the 2 and 5 minute mark, "Wow, you are way behind compared to the others who played" at the 10 minute mark, "That was supposed to be one of the easier levels" at the 20 minute mark," and "About time!" at the 15 and 25 minute mark. Each individual was given 30 minutes to play to the best of their ability.

Participants completed a post-game demographic survey once they had completed game play. The post-game survey integrated a manipulation check asking participants to identify the feedback they received while playing (positive or negative). After the post-game survey, participants heard a debriefing statement and were allowed to ask questions. To avoid potential confounds, the same researcher gave both positive and negative prompts.

Procedure

Participants were randomly assigned to one of two conditions: half played the game and received the positive feedback variation; the other half played the game but received the negative feedback variation. The researcher, sitting behind the participant, as previously described, administered positive or negative feedback at the 2 minute mark, 5 minute mark, 10 minute, 15 minute, 20 minute, and 25 minute. Upon completion of game play, participants completed a post game survey. At the conclusion of the study participants were debriefed by the researcher and asked to not share any information with other students.

Results

Prior to analyses, an investigation of the manipulation check showed 94% of participants correctly identified the verbal prompts given during the research. A 2 (feedback: positive vs. negative) x 2 (sex: men vs. women) between-subjects ANOVA was conducted on the dependent variable of performance as measured by medals (1 = *bronze*, 2 = *silver*, 3 = *gold*). Although significant main effects for feedback, $F(1,30) = 8.034, p = .008, \eta^2 = .211$, and sex, $F(1,30) = 37.981, p < .001, \eta^2 = .559$, existed, these findings are superseded by a significant in-

teraction found between sex and feedback, $F(1,30) = 15.15, p = .001, \eta^2 = .336$ (see Figure).

Simple effects analyses indicated men ($M = 30.76, SD > 7.85^3$) do not significantly outperform women ($M = 27.80, SD > 7.8^3$) in response to positive feedback, $F(1, 30) = 3.196, MSE = 9.960, p = .084$; however, when examining negative feedback, men ($M = 32.154, SD > 6.0^{16}$) significantly outperform women ($M = 19.00, SD > 7.8^0$), $MSE > 9.960, p = .445$. Additionally, whereas men showed no significant difference in performance when comparing positive versus negative feedback, women significantly differed in response to feedback with those receiving positive ($M_{positive} = 27.80, SD > 7.8^3$) outperforming those receiving negative ($M_{negative} = 19.00, SD = 3.464$), $F(5, 74) > 58.9^{12}, MSE = 9.960, p = .001$.

Discussion

The present study was designed in order to observe men and women's performance on a spatial-reasoning videogame, and the affects of the feedback received (i.e., positive or negative). It was hypothesized: 1) positive feedback would result in better performance overall, 2) men would outperform women, due to the fact it is a spatial task (again, see Linn & Peterson, 1985; Voyer, Voyer, & Bryden, 1995 for review of sex differences in spatial reasoning). Finally, 3) it was hypothesized men would respond more favorably to negative feedback whereas women would perform at better levels when given positive feedback. Results supported the first two hypotheses, but not the third.

Findings from the present research relate to

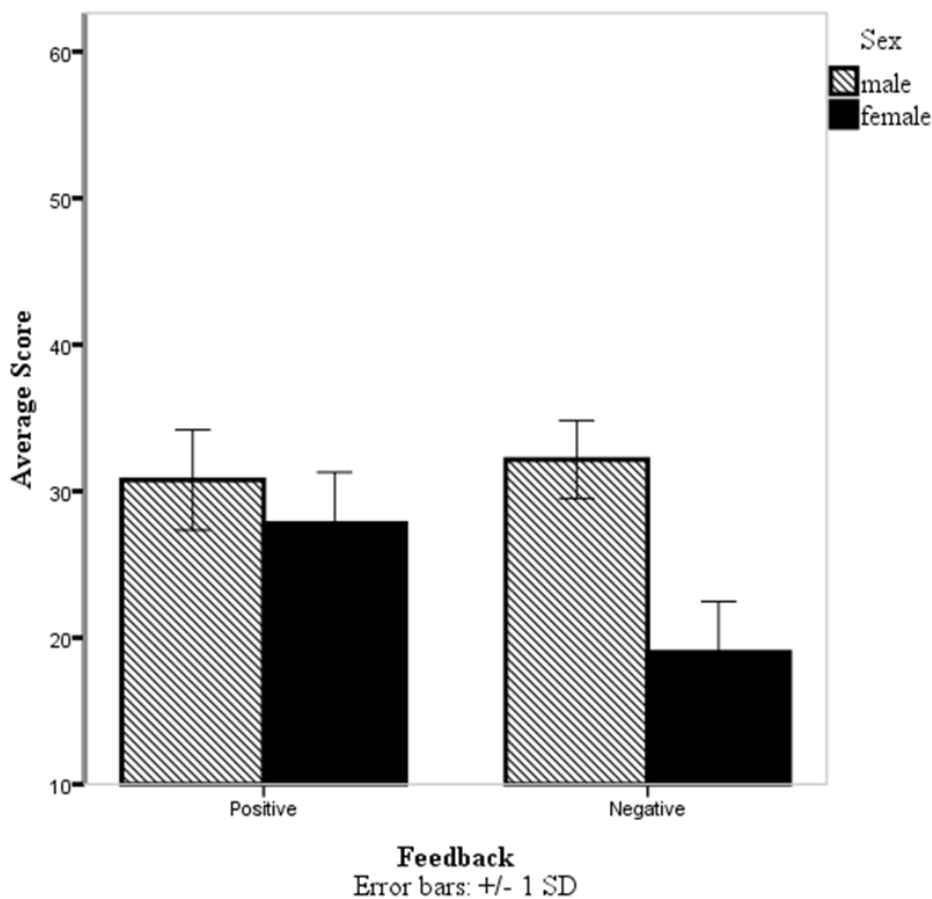


Figure. Significant interaction between sex and feedback on performance.

each of the aforementioned studies. For instance, Bloom (2009) found positive feedback improved individuals' overall performance levels. Much like those findings, the current study found a main effect of performance suggesting men and women, generally speaking, responded more favorably to positive than negative feedback. Furthermore, current findings, in accordance with Bloom denoted there are major benefits regarding positive feedback.

As is the case in most psychological research, there are some limitations in the present study. For example, the sample size consisted of a men-to-women ratio of just over 3:1. The combination of women not being well represented and the study having a small sample size made it difficult to generalize the significant interaction. Another limitation was pre-existing knowledge and varying skill sets regarding video games. The differing knowledge could have affected participants' mood, motivation, and willingness to perform to the best of their ability. Although there are limitations to the present study, there are still multiple implications and applications. A key implication from this research is with regard to the importance and consistent use of feedback for performance results in the school setting. In a way, the participants from this study were like students, listening to the teacher (researcher) and then completing the assignment (i.e. playing the videogame). By applying these findings to a learning scenario, teachers, principals, and parents, should recognize learners may respond more favorably to positive and negative feedback, and thus affecting performance. Another application for these findings is to the work setting. In the present study, men responded similarly to positive and negative feedback, whereas women responded more favorably to positive feedback. This beneficial response should be recognized in the work setting when looking to increase employee performance. Schools and work settings already use feedback, but the findings from this study will help reinforce or weaken their current beliefs regarding performance and problem solving.

To expand upon the findings of this study, additional research should be conducted with the inclusion of a large countdown clock in the room where the participants played the game. The inclu-

sion of a countdown clock could lead to more anxious and frantic game play, either helping the individuals or hindering performance. In addition, the researcher could have stated the participant was either making good time, or extremely behind schedule. Once again these situations could lead to an either anxious or motivated participant during the study. This would be interesting because some of the individuals already felt the pressure of doing well or poorly during the study.

In sum, feedback and motivation tie directly into multiple aspects of existence. By not fully understanding these two notions, we are susceptible to not fully maximize performance. The current research showcases how an individual's sex can differentially correlate to whether he/she performs better after receiving positive or negative feedback. By keeping in mind these and other personal characteristics, we can promote productivity and success.

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Special Features

Conducting Psychological Analysis: Dramatic

Dissociative Identity Disorder in Cillian Murphy's Character in *Peacock*

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Abstract—*Peacock* is a film set in rural Nebraska telling the story of John Skillpa, a banker who has dissociative identity disorder (DID). He struggles to keep his disorder a secret, but frequently dissociates between his main self, Emma, himself as a young boy, and even his mother. These different sub-personalities are illustrated through differences in clothing, mannerisms, and general personality characteristics. John exhibits frequent forgetfulness, another characteristic symptom of DID. The film also suggests that John's DID may be caused by childhood abuse from his mother. Psychoanalytic theory sheds some light on the disorder depicted in the film.

Keywords: DID, films, psychopathology, psychoanalytic, dissociative disorders

The 2010 film *Peacock* (Brown, Kahane, Mendel, & Lander) tells the story of a small-town banker with a serious psychological disorder. Set in rural Nebraska, the film depicts the life Cillian Murphy's character, John Skillpa, who has dissociative identity disorder. John exhibits all of the diagnostic criteria noted by the *Diagnostic and Statistical Manual of Mental Disorders* (8th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000), which focuses on the existence of two or more distinct identities or personalities in one person. These personalities recurrently take over John's behavior and cause him grave memory lapses. Cillian Murphy is able to successfully portray these different identities through his character's personality development, mannerisms, and clothing differences.

John Skillpa is a small-town banker who struggles to hide his dissociative identity disorder. John prefers to keep to himself so no one will discover his main sub-personality, Emma. After a train crashes into his backyard, Emma is unveiled

and John now is forced to deal with making his unusual situation appear normal to his neighbors. John claims he and Emma are husband and wife, a story that satisfies the town's curiosity. John's friend, Maggie, holds the secret to his past and the reason as to why he developed dissociative identity disorder. In John's interactions with the townspeople and Maggie his attempt to control the situation eventually fails. His seemingly calm and collected life spirals out of control and ends unexpectedly.

According to the *DSM-IV-TR* (APA, 6444), the first diagnostic criterion for dissociative identity disorder (300.14) is the presence of two or more different identities. These may be personality states, but they must be distinct. Typically, these identities or personality states are different in terms of perception of and relation to the environment. In this film, Cillian Murphy's character displays four different identities. The distinctions are made clear by personality differences, as well as changes in attire. John himself is the host per-

sonality. He is masculine in appearance and wears a suit. John prefers to keep to himself, both physically and emotionally, often appearing painfully shy in his interactions with others. He has a very strict routine for his daily life and becomes very agitated when it is disrupted. His drive for control and reservation is motivated by his desire to hide his dissociative states. When the train crashes through his fence it causes a lot of chaos for John. His routine is interrupted and he is forced to interact with his neighbors. He typically gives short answers, walks away quickly, and shows physical signs of agitation in these interactions. When John comes out of one of his dissociative periods, he spends much of his time trying to repair damage his main sub-personality has done to his daily routine and hermitic life-style.

John's main sub-personality is Emma. John and Emma have a mutually cognizant relationship; meaning each knows the other exists. John's dissociative periods where he acts as Emma are distinguished through Emma's feminine appearance, wearing a dress, wig, and make-up. In contrast with John, Emma is outgoing, takes risks, and is laidback. As a part of her risk-taking personality, she often allows herself to be more vulnerable. Emma desires to control situations as John does, but she is motivated to do so by wanting power. The first time Emma is exposed to the public is when the train crashes into the backyard. John is in a dissociative state appearing as Emma, and she has a chance to socialize with the neighbors for the first time. Emma is very approachable in her conversations, once she understands John will not be able to hide her anymore. Illustrative of Emma's openness and desire to be social, she makes arrangements with the current mayor's wife to use the crash scene as a backdrop for his re-election campaign.

A second, but much less depicted sub-personality of John's is a child-like version of himself. John's demeanor changes while he is in the grocery store and sees candy and baseball cards at the checkout stand. He immediately becomes more timid and speaks in simpler sentences. He takes the candy and cards back to his house where he uncovers a box filled with old wrappers and more cards. This suggests John dissociates into this personality much more than shown in the film.

The last sub-personality is also only shown briefly and is that of John's own mother. The audience can differentiate this personality from the others because John is wearing his mother's dress and a wig. This identity is similar to John in that she is controlling, but is different because she is much more demanding, brusque, and overbearing. His mother's actions ultimately lead to the death of John, suggesting she desires to have control over him until his last minutes of life.

The *DSM-IV-TR* further states the behavior of individuals with dissociative identity disorder must be recurrently controlled by one or more sub-personalities (APA, 2000). In *Peacock* (Brown et al., 2010), the first time the audience sees Emma is in the privacy of John's home. His strict schedule allows him to function both as himself and Emma during different times of the day. After the train crash, he is forced to abort his schedule, and Emma appears more often. Due to grave personality differences, Emma creates many situations for John that cause him discomfort when he comes out of a dissociative state. John and Emma are in a constant battle regarding the situation with the mayor's wife and the use of the train crash site as the mayor's campaign background. He spends much of his time undoing what Emma has done, as he is not comfortable with decisions she has made.

Emma, being the more open and outgoing of the sub-personalities, typically comes out when the scene involves some sort of emotional risk for John. Specifically, when John's friend Maggie comes to visit, John talks with Maggie for a while until the conversation becomes uncomfortable. John leaves, and Emma appears. Emma learns from Maggie that John's mother forced John to have a sexual relationship with Maggie and John is the father of her child. It is also Emma who builds the courage to explore John's mother's old bedroom and moves pictures of her out to open areas of the house. As the movie continues, John dissociates more often, suggesting Emma is gaining increasingly more control over John.

Emma's regular appearance as a sub-personality culminates with her removing John from her life. With the help of John's sub-personality of his mother, the two of them arrange for John to essentially fake his own death. In preparation for John's death, Emma shaves her eyebrows

suggesting she will never need to look masculine again. John's mother arranges for Maggie to see what appears to be John's death as an outside witness. Emma uses another man's body, takes him to a hotel room, plants John's belongings there, and then lights the room on fire. Since John no longer exists to the public, Emma has taken control and is now free to live publicly as she desires.

In addition to Emma's regular emergence, John's child-like personality must come out often. Although not directly shown in the film, the box filled with candy wrappers and baseball cards suggests this personality emerges frequently, probably when a particular object sparks a memory for John of his childhood.

The third criterion for the diagnosis of dissociative identity disorder, according to the *DSM-IV-TR*, is the inability to remember information that is too broad to be explained by normal forgetfulness (APA, 2000). When John comes out of a dissociative period or enters into one as Emma, both personalities initially spend time discovering what the other has done. The first situation exemplifying this memory loss is the situation with the mayor's wife. When John comes out of a dissociative state, he discovers that Emma has continually made arrangements to use the train crash scene in their backyard for the mayor's campaign. John has no recollection of this and takes measures to ensure this will not be done, even going so far as to illegally hire a welder to remove the train so Emma cannot continue this pattern. When John transitions into a dissociative state, Emma discovers what John has done and repeatedly attempts to set up the campaign background again with the mayor's wife. This back and forth phenomenon continues until John dies. Neither remembers making changes and both have very different preferences.

The second situation in the film demonstrating this extreme memory loss deals with John and Emma's relationship with Maggie. Once Emma discovers John is Maggie's son's father, she arranges for Maggie to stay in town and get a job so she can support her son and stay closer to John. When John discovers what Emma has done, he has no recollection of these arrangements and is furious with Emma. John prefers that Maggie move out of town so he will not be reminded of the past; hence he never would have made such arrangements himself. This

is another situation in which John and Emma work against each other until John's death, and exemplifying their drastically different personalities.

Finally, the *DSM-IV-TR* states the aforementioned psychological disturbances must not be due to effects of substance use or a medical condition (APA, 2000). At no point in the film does John or any of his sub-personalities use any type of substance or display any type of medical condition, nor does the film allude to either of these in the past.

Anecdotal evidence is offered through another character in *Peacock* (Brown et al., 2010), which may explain John's development of dissociative identity disorder in terms of the psychodynamic theory. Psychodynamic theorists suggest this disorder is developed in an attempt to repress a serious, traumatic life event (Comer, 2010). In John's case, his mother forced him to have sexual interactions with Maggie. Supported in research, trauma, such as the sexual abuse John experienced, is linked to the development of dissociative identity disorder (Everest, 1999). According to psychodynamic theory, John's development of this disorder allows him to better deal with the trauma, keeping many of his memories from his host personality.

Additionally, the sub-personalities can be understood by applying Freud's psychoanalytic theory to this film. This theory, which emphasizes the unconscious, is one explanation of personality and mental disorder development. Freud proposes human beings are unaware of the unconscious portion of the mind because it holds anxiety provoking, threatening memories. The conscious mind refuses to acknowledge its existence in an attempt to protect the individual. Freud also discusses two forces in the unconscious mind: Eros and Thanatos. Whereas Eros is considered to be the sex drive, Thanatos is the "death instinct" and drives destructive acts toward the self and others (Zimbardo, Johnson, & McCann, 2009). In *Peacock* (Brown et al., 2010) Freud's theory can explain the development of John's sub-personalities as well as the motivations behind them. This theory suggests John's traumatic sexual abuse memories are stored in his unconscious, and his conscious mind is attempting to repress those memories. In order to better protect John, John's own mind has developed his sub-

personality of Emma who understands the traumatic memories and keeps John from knowing about them. Emma can also be seen as a portrayal of Thanatos. Although her development may have initially been intended to protect John, ultimately her increasing control causes John's death. Her actions drive John out of existence, and she gains total power over his life.

Peacock (Brown et al., 2010) provides a detailed account of one man's struggle with dissociative identity disorder. John has clearly developed different personalities that repeatedly take control of his everyday life and actions. Emma, his main sub-personality, differs from John in almost every aspect of their personalities. Although not depicted often, John also developed sub-personalities of himself as a child and of his own mother. This film highlights these symptoms, and brings to light the psychodynamic theory behind the disorder. John's symptoms are not side effects of substance use, nor are they the result of a general medical condition. As the psychodynamic theory suggests, John's disorder was most likely caused by his early childhood abuse by his mother. Although not a popular film in society today, *Peacock* (Brown et al., 2010) portrays dissociative identity disorder in both an accurate and compelling manner that the audience can easily understand.

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Special Features

Conducting Psychological Analysis: Dramatic

Psychology Dramatized: *Shutter Island* Film Analysis

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Abstract—The film *Shutter Island* explores the serious nature of mental illness, as it depicts a variety of traits indicative of a number of potential psychological conditions. Though the lines between reality and cinema are blended together throughout the film, the audience experiences the struggle and stigma associated with mental illness. Several psychological theories play a part in the interpretation of the film and once carefully examined, *Shutter Island* challenges the accuracy of human perception and the idea that one's reality may not be infallible.

Keywords: Shutter Island, cinema, media depiction, film

Overview

Martin Scorsese behind the lens and Leonardo DiCaprio in front of the camera make for quite a thrilling film sure to frustrate viewers both physically and cognitively. What begins as a seemingly innocent attempt to uncover a conspiracy at a mental hospital on Shutter Island leaves U.S. Marshal Teddy Daniels (DiCaprio) entangled in a web of personal demons while amidst the criminally insane. Throughout the movie, Teddy demonstrates characteristics of multiple psychiatric diagnoses and specific psychological elements, many of which are highly dramatized and tend to exaggerate normal traits for the sake of entertainment. By mixing together aspects of schizophrenia, delusional disorder, and post-traumatic stress disorder (PTSD) with traits of anterograde amnesia, the plot follows a man at the mercy of his own mind whose symptoms seem to play games with the audience. In the end, a struggle can be identified between Teddy's mind and the doctors on the island. As his mind attempts to record over painful memories with more pleasant ones, the doctors

continue to let him play out his delusions in the hope he will come to understand how problematic and dubious they truly are.

Viewers begin from the perspective of Teddy. Traveling by boat to the Alcatraz-like Shutter Island, Teddy and partner, Chuck Aule (Mark Ruffalo), are supposedly sent to investigate a missing female patient. Soon after they arrive, the naivety wears thin and Teddy starts to suspect Dr. John Cawley (Sir Ben Kingsley) of obstructing justice. Even before a proper case begins to materialize, Teddy experiences intrusive moments of intense fear and paranoia, stemming from his background as a soldier present during the liberation of Dachau. The cutting visuals interrupting his investigation present haunting, distorted depictions not only of concentration camps but also his tortured family. The murder of his three children and his war experiences are certainly the type of extreme stressors related to flashbacks due to PTSD, according to the *Diagnostic and Statistical Manual of Mental Disorders* (8th ed., text rev.; *DSM-IV-TR*; American Psychiatric Association, 2000). Those

observing the flashbacks experience the confusion and distracting nature of these meddlesome intrusions as well.

Portrayal of Psychiatric Symptomatology

Grisly memories from World War II continue to flare relentlessly throughout the film, especially as Teddy encounters certain triggers, suggestive of PTSD. When he sees a vehicle parked behind a building on the island after exiting from a rather hostile conversation with one of the doctors, his mind instantly returns to the war and he scrambles for cover behind the vehicle. The white vehicle triggered memories of hiding behind stacked walls of dirty beige sandbags. Without explanation, Teddy suddenly produces a Molotov cocktail and the car is soon engulfed in flames.

Because certain cues in the environment can act as triggers for PTSD, attempts to avoid these reminders may include amnesia for specific events. Part of the complex makeup of the film revolves around what can be considered anterograde amnesia on Teddy's part. Anterograde amnesia is the loss of memory of events occurring after the onset of the precipitating event. Teddy appears to have lost the ability to retain memories formed after the traumatic time he spent in the war and preceding the death of his family. This symptom is paramount to the complexity of the plot as it explains why Teddy cannot simply form new, pleasant memories over the painful ones and why the cycle of roleplaying will not work to allow him to see the implausibility of his delusions. Though several disorders may contribute to this amnesia, traumatic events tend to disrupt autobiographical memory, which may lead to the memory distortion Teddy experiences (Brewin, 2001). Traumatic events akin to those in Teddy's past may impair his ability to recall autobiographical memories as well (Moore & Zoellner, 2007).

Unlike genuine PTSD flashbacks which are associated with events that actually occurred, Teddy's "flashbacks" repeatedly spin tales of his deceased wife, Dolores. The episodes seem to be attempts to rewrite and fictionalize the truth of his past once Dolores is shown to blame for the drowning of their three children. This disturbance in consciousness which develops over a short period of time might be considered delirium rather

than a true PTSD-type episode (APA, 2000). It is also associated with memory impairment and misperceptions or misinterpretations of the surrounding environment. Although moderate amounts of emotion may enhance it, memory can be debilitated by extreme levels of emotion (Brewin, 2001).

Such emotion may have arisen when Teddy arrived home after Dolores had murdered the children. She appeared unaffected by her acts and even suggested they carry on as a normal family and have dinner together. Even though this may have been a manic state, throughout the rest of the film she is shown in a very dark and depressed state. Anything Teddy says to her, real or imagined, falls flat as she cannot seem to process positive emotions. Bipolar disorder is similar to the actions shown by Dolores, involving the occurrence of manic or hyperactive episodes and cycling to or between depressive episodes as well (APA, 2000). The peaks and troughs in Dolores's behavior, combined with the murder of their children, send Teddy over the edge and he ends up killing her. This burning memory, too, makes incessant attempts to distort and rework itself in his mind. Soon, the delirium becomes apparent not only in Teddy's mind but also in his interactions with others.

At one point, while talking to one of the doctors about the missing patient, he detects a German accent and the mood of the conversation quickly takes a negative turn. Soon after this exchange, he talks to his partner about the possibility of a large conspiracy on the island in which Nazis are experimenting on the patients while the government covers it up. This episode of delirium might also represent a display of delusional disorder, with which patients can be highly functioning yet experience clear mental hiccups. As described in the *DSM-IV-TR*, individuals with delusional disorder are often highly functioning individuals and experience delusions which appear logical and seem to be consistent (APA, 2000). Teddy does experience several non-bizarre delusions in which he is adamant about information which has no factual basis or evidence supporting it, including his conspiracy theory. Part of what makes the movie so compelling is that Teddy remains believable almost the entire time, even though he displays mixed-type delusions ranging from the grandiose possibility of a mass conspiracy to paranoia and thoughts of be-

ing persecuted.

After Teddy decides to place full trust in his newfound conspiracy theory despite a complete lack of evidence, his delusions seem to gain increasing authority over his behavior. A delusion in itself is a belief based upon an incorrect inference held to as truthful despite what others believe or the presence of evidence proving otherwise (APA, 2000). When he develops a migraine headache, he refuses to take aspirin given to him by the orderlies because he believes it may be poison or some other mind-altering substance. Instead of delving deeper into the mystery he came to the island to solve, Teddy grows increasingly distrustful of the medical staff. It is clear the events in Teddy's mind cause him to struggle to communicate what he is actually seeing and feeling. Unfortunately, accusing the staff of conducting inhumane, Communist-style experiments on the asylum inmates only lands the hypervigilant Teddy in more trouble. In response to the increasingly stressful investigation, he is pulled even deeper into his delusions, plagued by nightmares while asleep and throughout the day. Insomnia, irritability, and hypervigilance are also symptoms of PTSD (APA, 2000).

Viewers begin to connect Teddy's experiences with internal causes when his delusions turn bizarre. Because of the enveloping style of the flashbacks, delusions, and missions to uncover secrets he believes the doctors are keeping from him, the investigation stagnates. His wife appears to him in a dream-like state, walking up to him in their old apartment and asking him why he did not help her. He seems confused and tries to hug her before she crumbles to ashes and floats away. This scene breaks away from characteristics of delusional disorder and instead resembles positive symptoms or excessive increases in normal function demonstrative of schizophrenia, which involves much more prominent and unrealistic delusions or hallucinations. The hallucinations he is now experiencing are perceptions made without proper external stimuli and tend to be less realistic.

Though he does not show the disorganized speech or catatonic condition which could be present, Teddy exemplifies paranoid-type schizophrenia because he develops persecutory delusions organized around a common theme and ex-

hibits anxiety, extreme intensity in interpersonal interactions, and aloofness (APA, 2000). He is so immersed in the idea the staff is harming his investigation and something must be done about his wife's murder that he has a short temper with anyone who crosses his path. At one point, he grabs a patient he walks by the cells and begins to beat him without provocation! It should be noted that the combination of persecutory and grandiose delusions with anger can increase an individual's propensity for violent behavior (Douglas, Guy, & Hart, 2009).

Stigma

At this point, those individuals watching the film struggle with their perception of the characters involved. The attribution theory may explain why the directors kept viewers out of touch with the genuine nature of the plot for so long—about whether Teddy was a U.S. marshal or a mentally ill patient on Shutter Island. This theory is concerned with the ways in which individuals explain or attribute the behavior of others. If everyone were to be aware from the beginning of the film of the ruse that unfolds and leaves Teddy as the mentally ill patient instead of our cunning hero as depicted in the opening scenes, the box office surely would have suffered. Depending on which factors are attributed to the cause of Teddy's odd actions, the audience members may remain at the edge of their seats hoping for the unveiling of a massive conspiracy or instead write off the main character as hapless and insane. Thus, attribution may ruin one's ability to follow the plot with an open and curious mind, leaving him or her subject to internalized stigmas (Corrigan, Kubiak, Markowitz, & Rowan, 2003). The entire movie gambles on the fact that viewers will attribute Teddy's demeanor not to mental illness but other external factors, including the possibility of corrupt doctors or a government scheme, and thus allow the movie to enthrall them. Personal beliefs about these causes in turn impact individual reactions to the movie, interpretation of the characters, opinion about the true complexion of the plot, and more.

Summary

To end the problems resulting from Teddy's marred memories and mental illness, the Shutter

Island staff continually follows along with his delusions and hallucinations. The hope is when he carries out the investigative role play, he will not be forced into believing the truth but instead he will discover it for himself. Teddy's mind wants him to believe a fictional version of events, yet by following along with this version of events, the staff uses their authority and credibility as sources to reinforce these events as true. Because he has a partner in the investigation and everyone seems to be searching for the missing patient as well, this consensus information makes it easier to corroborate the story. The imagination inflation paradigm further prevents Teddy from the possibility of recovering and processing his memories differently because the act of imagining or role playing the events serves to increase his familiarity and fluency with them (Leding, 2012). As a result, his confidence is increased that the events are likely to have actually occurred in that particular way in the past.

This confidence may be more theatrical than realistic in the film, yet it reminds viewers that memory and experiences can be more subjective than often realized. Though labels are never assigned to his symptoms throughout the movie, Teddy's maladaptive behavior at the very least is a major indicator of abnormality, dysfunction, or further possible disorder (APA, 2000). Cinematically, *Shutter Island* accomplishes a great feat by allowing those individuals watching to experience the disjointed, intrusive disposition of Teddy's reality. As observers attempt to decipher the film and what is truly occurring, they are confronted with challenges similar to ones faced by those who struggle with conflicting memories or mental illness as Teddy did. Though some were exaggerated, several of the symptoms displayed in the film demonstrate how mental illness can take advantage of the subjective nature of memory and reality.

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Psychologically Speaking

Teacher, Scholar, Author, Administrator: An Interview with Dana S. Dunn

April Guthrie, Breanna Carman & Dr. Richard L. Miller

University of Nebraska at Kearney

Background—Dana S. Dunn earned his B.A. in psychology from Carnegie Mellon University and received his Ph.D. in social psychology from the University of Virginia. Former chair of the Psychology Department and Philosophy Department at Moravian College, a liberal arts institution, he is currently Assistant Dean for Special Projects and Professor of Psychology there. The author or editor of 17 books and over 130 journal articles, chapters, and book reviews; his scholarship examines teaching, learning, and liberal education, as well as the social psychology of disability. A fellow of the American Psychological Association (APA) and the Association for Psychological Science (APS), Dunn served as president of the Society for the Teaching of Psychology (APA Division 2) in 2010. He is currently editor-in-chief of the *Oxford Bibliographies (OB): Psychology* and editor of the forthcoming *Oxford Handbook of Psychology Education*. Dunn received the Charles L. Brewer Award for Distinguished Teaching of Psychology from the American Psychological Foundation in 2013.

Miller:

The *Journal of Psychological Inquiry* publishes undergraduate student research. In addition, there is a Special Features section that serves a variety of purposes. It is a forum for student essays on topical issues and also features, from time to time, articles that provide information of interest to both faculty and students related to the research process. We have asked you for this interview in order to explore your thoughts on the role of undergraduate research in teaching. The audience the interview is primarily designed for are students, and secondarily for faculty. Particular emphasis is on the scholarly component of teaching and learning and how that relates to students conducting research and subsequently presenting and publishing the results of that re-



search. The two students who will be conducting this interview are April Guthrie and Breanna Carman. Both Carman and Guthrie are juniors at the University of Nebraska at Kearney. April is double majoring in psy-

chology and social work and her career plans are to become a social worker. Breanna intends to complete graduate study in counseling psychology. So without further ado, I will leave you in the capable hands of these students, who have prepared a series of questions.

Guthrie:

Our first question is: Who influenced you to become a psychologist? Were there significant teachers who played a role in your decision?

Dunn:

Oddly, I decided to become a psychologist in high school. I was taking a psychology course, which was not very good, taught by a high school teacher who was head of the English department at my high school. I don't know why she got to teach a psychology class. The book we had was awful, it was old, but I got interested in the Milgram experiment and the Asch study, the social psychology section of the book. So when I started looking at colleges, I had it in mind that I was probably going to do psychology. Unfortunately, I'm very linear, so when I pick something I stick with it unless it turns out to be a really bad choice. So I knew all through college that I was going to be a psych major and was going to go to graduate school, and I did.

Carman:

What was the reaction of your family and friends to your choice of psychology?

Dunn:

Well I can tell you what my father said. The summer after my freshman year, I was looking for a job and ended up working for my father who owned a business in the town where I grew up. I grew up in a small town of about 17,000 people in southwestern Pennsylvania. He had offices in different places. We were driving from the main office in the town where we lived to a satellite office in a small city about 40 miles away. We were having one of those father-son talks and he asked me what I was thinking about majoring in, and I said I was going to be a psychologist. There was a long pause, and he

TEACHER, SCHOLAR, AUTHOR, ADMINISTRATOR

said, "Honey, will you be able to eat?" I didn't laugh, I laugh now, because that had never occurred to me. I never thought about money, paying for things, cost of living, or job prospects, I just thought, this is what I want to do. My mother was pretty supportive. My brother, who was much older than me probably just said "Oh really? That's interesting." My friends were always pretty intense about what they were interested in, so that was cool that I had a vision for myself. I made it clear that I had no interest in clinical psychology, I don't have enough empathy and I like to talk too much, so I'm much better off in a classroom than in a clinic.

Guthrie:

What led you to experimental social psychology?

Dunn:

I mentioned the Milgram and the Asch studies. As an undergraduate, I went to Carnegie-Melon in Pittsburgh, where they had a very strong psychology department. They did very few areas, but did them really well. When I was a student there in the late 70's, there weren't many psychology majors. In my class, there were maybe eight people. The humanities college wasn't that big, and the psych department only had eight, ten, maybe twelve faculty members. Cognition was the biggest area, mostly memory. Social psychology and developmental psychology were also present, but they were phasing out the physiological area. There was no clinical psychology. There was one clinical psychology class, but if you were a psychology major, you were forbidden to take it. I got interested in social psychology and worked with Susan Fiske. I had her for a freshman course and I ended up doing research with her for a semester or two.

Carman:

Why did you decide to become a professor?

Dunn:

I loved college. I knew the first week that I was never leaving, this was it. I could not imagine doing anything else. I've always loved reading and doing my own thing. I always tell my students that they subsidize my

chief interests: reading, writing, arguing, and talking. I love doing all of those things, I have an audience, and I get paid for it. I absolutely loved virtually every minute of college except for calculus and chemistry; I learned to like calculus, I could never like chemistry. I loved it and I decided, this is it, I'm not leaving. My parents assumed that when I said I was going to be a psychologist that I would be doing therapy and counseling, but I said, no I'm going to work at a college or university.

Guthrie:

What motivated you to get involved in scholarship and research?

Dunn:

I had the experience with Susan Fiske. I also took a class my junior year on political behavior, studying voter decision-making. It sounds like a dry topic, but it was really fascinating. There were some very interesting studies on people's political judgments. I got turned onto that, so I did an honors thesis my senior year on voting behavior. It was an experiment of sorts where we gave people candidate information and we constrained their choices. People say that they want to find out as much about a candidate as they can, but that's not true. In some conditions, people were allowed exhaustive amounts of information about a candidate. For other conditions, they were limited in the number of items they could look at so you would track which ones they picked. I was trying to make the argument that when people vote, they look at a fairly narrow number of items. That was a nice experience, and then I applied to graduate school and got interested in other topics.

Carman:

What were some of your early research interests?

Dunn:

I did some research on stereotyping. I was always interested in prejudice. I took a course on social cognition taught by Fisk. That was eye opening, I'd always loved cognitive psychology, so I decided that I was going to go to graduate school and work

with someone who was doing that. I had lab intensive courses. I did a social lab and a cognitive lab. In the social lab we designed our own experiment and ran it. In the cognitive lab, we did a lot of classic experiments and had to introduce independent variables. It was a terrific experience because you really learned how to conduct research and it's amazing how hard you can work when you have to. I really learned to write APA style in those classes because professors mandated that we had to do it. Oddly, I enjoyed it because it wasn't terribly creative and you knew what to expect. In lab, when we shared our data, you got to tell the story from your point of view and I had a great group of peers who were all really competitive. I loved it and I knew that's what I wanted to do. I like the solitary aspect and I enjoy writing the most.

Guthrie:

After looking at your academic genealogy, what did you do in terms of research that was most like what Festinger did?

Dunn:

The things I did with Wilson on attitude behavior consistency were related because we were trying to understand how attitudes predicted behavior, and when they did and didn't. My own dissertation research probably had nothing to do with Festinger. When I started at the institution I've been at for the last 25 years, I couldn't continue to do the lab-based work that I was used to doing; I didn't have access to enough participants. So I started doing stuff with pedagogy. I started shopping around and working with other psychologists, in my department and in a neighboring university, who were looking at applied topics. Somehow, we got onto the issue of working with people with disabilities. There's classic literature in social psychology on attitudes toward people with disabilities. There's also all kinds of work about prejudice, discrimination, stigma, and person perception. The people who worked in this area originally were Lewin's students, like Festinger. The area of attitudes is central to social psychology. However, if you

look in most books about prejudice and discrimination, disability hardly gets studied. Yet, among the most discriminated groups in our culture are people with disabilities. Another wing of this discipline is rehabilitation psychology. Its purpose is largely to improve the lives of people with disabilities in a functional way. I stumbled on this and started reading it. I think of it as holding true to some of the original values that the discipline started with; taking important social theory and applying it to practical circum-

When I work with students, I have them immerse themselves in reading, we decide on a topic, and we spend the summer writing an article.

stances, which is a Lewinian message.

Carman:

How, if at all, have you involved undergraduate students in your research?

Dunn:

In various ways. I've had a series of research assistants helping me with projects, collecting and analyzing data. I've also done lots of honors projects with students. At my institution an honors project is when a student has two courses their senior year that are dedicated to a student-designed research project. A faculty member helps the student design the study, but it is really the student's work. A lot of times, collaborations develop out of that. The Moravian now has a nice program for students called the Student Opportunities for Academic Research (SOAR). Basically, the college has money to pay the students \$3,000 and the students also get a room in the dorm on campus. The student spends ten weeks on campus and they get paid to work on the faculty member's research project. When I work with students, I have them immerse themselves in reading, we decide on a topic, and we spend the summer writing an article. We meet periodically and send drafts back and forth. By the end of the summer we

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have a 30-40 page manuscript and we send it off for publication. So far, every one I've done has gotten accepted. It's nice because it keeps me going; it gives me an incentive because I make a promise to my students. It's also great for the students because they get experience in writing and research and then graduate with publications. If they want to go on to graduate school, they have something on their resume and they have research experience. Right now I'm writing a book called *The Social Psychology of Disability* for Oxford University Press. A student that I had last summer will work with me again this year. He has a disability himself and he raised an interesting question. He asked me who was going to hire him after he graduates because there is so much prejudice against people with disabilities. He was interested in how and why people with disabilities get hired and what prevents people from hiring them. He'll be writing this paper in which he'll be the first author because it is his project. Since I'm independently writing this book, I'm also giving him chapters so he can edit and make suggestions and try to work his idea into chapters. This is terrific for me because I have a deadline and when I have a student involved, it's more motivating.

Guthrie:

How did your early undergraduate experience shape the way you deal with undergraduates now?

Dunn:

I went to a research university where research was very important. Research was number one and teaching was number two. I had many wonderful teachers, but I also had some that were not very good; they were very nice people but they really wanted to be doing their own thing. When you have someone who is a wonderful lecturer, they're a joy, but when you have someone who is a terrible lecturer, it's awful. I think when you have a teacher who relies exclusively on PowerPoint; it's no different than having someone read to you. So, I don't use PowerPoint or overheads in my classes. I

used to lecture, but now my classes are mostly discussion. At the beginning of my career, I spent a lot more time lecturing. Now we spend time discussing an article or a topic. I really depend on the students because we have more of a discussion. Moravian is a teaching institution and you get to stay if you are a good teacher; if you can work one-on-one with students, interest them, educate them, take them to a different place than where they started. Our classes are very small so what we do is very one-on-one.

Carman:

You touched a little on your teaching style and how it has changed, but how has it evolved over the years?

Dunn:

I used to worry a lot about coverage. If it was a basic social psychology course, and our book had fourteen chapters, we would have to get through at least twelve. We would have to cover all of the “greatest hits” topics. I had very detailed notes and every experiment that was important in social psychology would have to be covered and explained. It started feeling like when you’re on vacation and you never see anything because you spend all of your time just racing around. I realized at some point that wasn’t the way I should be doing it. Why not trust the students to read and get the broad view and then pick out a few things to talk about that are important? So I stopped worrying about coverage and focused on going in depth into things. A few years later I realized that it’s important for me to share what I know, but it’s equally important that we have more discussion. So I started making it more important. I started giving up control and worrying less. I used to worry a lot that I was not covering enough and that I was not doing justice to the topics. I was worried that the students would leave and not know enough about the subject. There are different ways to learn the same material and to teach the same material. You can do things differently and you can re-invent yourself. That’s what I really like about college, you get to re-invent

yourself. If a class doesn’t go well, I get a chance to redeem myself in the future by teaching it again and correcting my mistakes or making it better. If you’re a student, you get to re-invent yourself too. If you have a bad semester, you get to start over with a new semester. You still have grades and I still have teaching evaluations, there’s a record of our mistakes, but you still get to start a new semester and invent yourself again. I like that and I think that’s an important thing. I think professors forget that and they don’t experiment. A lot of people like to teach the same classes over and over again, but to me that’s just boring. I don’t like to teach multiple sections of the same thing during a semester; I like doing different things.

Guthrie:

What is your favorite part about working with undergraduate students?

Dunn:

I like collaborating on things that are of interest to both of us. I like seeing someone really work hard and discover their pleasure in the work. I always tell my students it’s not about personal happiness, you’ll be lucky if that ever comes, it’s about the work. The motto of one of the colleagues at Carnegie-Mellon is a quote from Andrew Carnegie-- “My heart is in the work.” And that philosophy is, strange as it sounds, really what that university was like when I was there, but it wasn’t for everybody. The university is very small and very specific; if you want experimental social psychology with a cognitive bend, we’re here for you; but if you want traditional social psychology, not so much. We’ll study it but you’re not going to be doing that. Everyone there, no matter what department they were in, had a really good work ethic and a real passion about what they did. That appeals to me working with undergraduates. I’m very careful about who I work with because I’m pretty demanding, in a good way. But also I expect students to rise to the occasion. We have a project in mind, work that has to get done, and we have to agree on deadlines. I think it gives

students a good experience. I think it's important for students to get those kinds of experiences and as much as the classroom is the place to exchange ideas, you don't get the experience of working on one big thing and I think that's what I like about working with students. Here we have an idea, a vision, a hypothesis and we're going to work it to death until we really understand it. That isn't for everybody. But when you find someone that really enjoys doing that, it's beneficial for them and I always learn something and am delighted when I work with students because they say things and I think to myself, I wouldn't have thought of that. That's the whole notion of collaboration, 99% of the time a collaborative project is going to be a better one because someone sees something you didn't. I think it's important for students too, I know my students always gripe about group projects. The best students want to work alone because they want to get that A, so if they're held back by the runt of the litter, that's a problem. Yet in life, you're going to have to work with the runts of the litter and you won't always be the swiftest. There's always someone smarter than you. You have to learn to work in groups or at least in collaboration.

Carman:

How do you think instructors can increase the appeal of research for their undergraduate students?

Dunn:

Certainly, making it sound appealing; not making it scary. I always worry when I hear people talking about research methods and statistics and how they present it and make it sound scary. If you do that it's a total turn off for students. On the other hand, you don't want to make it sound light and airy. I think you need to create opportunities in the classroom through teaching that give people a little taste of it. That can be doing a demonstration in class which gives people a sense of an "ah-ha" moment to think about, "I wouldn't have seen the world that way until I saw this demonstration." What I try to talk about, is the work I've done with previous

students if it's appropriate in the situation. Then you say people just like you have done this, are doing this and you can do this too. I think one of the most important things is to make it part of the campus community, make it a culture thing. If students want it, someone is doing something right. I think you need to try to create the environment where it's seen as important, and again enjoyable. You should see something come out of it. I think one of the most important things is one experiment or one study doesn't tell you all that much; it tells you something, but if it's a good enough project, it tells you what the next thing you need to know is so you keep on going. I think that's how you coax students into it. I would never say that everyone that majors in psychology should become a psychologist. I think you should study things that interest you and you don't have to become a psychologist to major in psychology. I think it's the responsibility of faculty members to make the work, the classroom environment, appealing so the students want to get involved in research. As opposed to this is a very abstract thing that only very few people get to do it. It's nice when students have the opportunity to get involved when they want to.

Guthrie:

You touched on this a little bit when you were talking about your book and your project for this summer, but do you have any future plans for scholarship and research?

Dunn:

Yes, I like big projects and I seem to like having multiple things going at once. I have this book that, with luck, I'll have a first draft done by the end of summer. I also have the article I mentioned with the student, I'm editing a handbook of psychology education, I'm editor in chief of what's called the *Oxford Bibliographies: Psychology*, which is asking experts in topical areas to write bibliographical articles on key research in their area. I have a lot of projects I want to work on. One of the other things I do is write textbooks. I like doing that because it's a different kind of writing. You're writing for students so you

write a different way to make it interesting, engaging and appealing so I'm always looking for a new idea there. I really love writing so that's pretty much what I do. I like to have things waiting so that as one thing finishes something else comes in. I always love what I'm working on but when I'm done I love the next thing. So I feel really blessed because I have a lot of "next things" in mind, or people approach me and say I have this next thing, which is nice. I used to worry when I became a professor that I would never have any ideas, which would be bad. But happily that hasn't panned out.

Carman:

You are currently Assistant Dean for Special Projects. What does that mean?

Dunn:

Every institution has stuff they want to get done but only some things get attention at any given point in time. My job is to try to deal with some of the back log. I'm working with our dean on a couple of projects. I'm still 70% in the classroom and the other 30% of my time is spent doing the deans work. I've been thinking about doing more administration, but I'm not sure I'm going to do that. I'm also a believer in you should never live with doubt so if you have an opportunity to try something, with the possible exception of skydiving or going on a Ferris wheel, then you should so you don't wake up twenty years later wondering what would have happened. If you want to try something, try it. Then you can legitimately say that wasn't for me.

Guthrie:

What do you see as the value of general education courses?

Dunn:

Many students come to college just wanting to do their one thing, but that one thing no matter how interesting and important it may be does not necessarily make them interesting people. You want to have lots of things to talk and think about. It's like we all start out life walking down this long corridor and there are doors open on every side but as we pass, the doors close and we can't go back in

those rooms. We have a finite amount of time and there are so many things that are interesting but we're not exposed to them. If you think about it, once you pick an area, like the social sciences, the natural sciences or the humanities, the doors start closing and you don't find out about things. I think general education serves a very important function of exposing us to and teaching us things we wouldn't know about otherwise and helping us see connections between the interests we have with these other things we don't know about. It also makes us more interesting people. Education, besides giving you the degree, opens horizons to you and

Here we have an idea, a vision, a hypothesis and we're going to work it to death until we really understand it. That isn't for everybody. But when you find someone that really enjoys doing that, it's beneficial for them and I always learn something and am delighted when I work with students because they say things and I think to myself, I wouldn't have thought of that.

makes you more confident. Therefore, when you meet strangers you have things to talk about or you can ask them questions, which is a great thing. If I had to do it over and I had no idea this (psychology) existed, I might have been an architectural historian. I read a lot of architectural history for pleasure now. I just didn't know that existed. My college roommate was in architecture but he never talked about architectural history. Years later I saw a book on architecture and discovered all these people did this. They looked into not only how buildings were built but who designed them and not only

how the design came about but how it evolved. Architecture is an interesting art form because while it is often created by one person or maybe a team of people, its money dependent. So if you're a painter you can paint whatever you want, no one may buy it but you still got to create it or if you're a songwriter you can write a song that no one will ever sing but you still write the song. But if you're an architect, somebody's got to build that building--no one's going to see it otherwise; it's not going to be like the song or the painting. Of course, putting up a building is much different so there are all these interesting stories about how these things came into being or not into being. And I thought why didn't I know about that? So now I'm reading for pleasure but I'm thinking in the back of my head, "Is there something I can do with this as a project?" I haven't decided yet what it is, maybe a book about psychology and architecture. But I think the most important thing to a general education is discovering things you never knew existed. I mean it certainly makes you a much more interesting dinner companion.

Carman:

What are you most proud of that you accomplished during your APA Division II presidency?

Dunn:

It was a transitional year and there were a lot of changes that had been put in place. My responsibility was to help those changes work. For years, a lot of people had developed disorganization and literally when it was just a group of people meeting at conferences they had no organizational money and no structure. Twenty years later it's this huge thing so they decide to make changes to try to expand the organization in different ways, change how certain things were done, and spend money differently. The change was like many changes are, a big transition for many people. They weren't sure it was a good thing, they still weren't sure it was the way things should have been done but we elected to try it. My year was spent really working on the work that had been done by

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the prior president to implement these policies and put them into place and sort of be a cheerleader and say you know we've got to try this, this is a new thing, maybe it will work maybe it won't work, if it doesn't we'll change it. That was a big deal to me. I felt responsible, even though I was not the architect of it necessarily. I mean I had a very small role, but that was important. In some ways I wish I had done other things, but I really felt like that was my responsibility and I did not want to make a mistake.

Guthrie:

Does your wife still work as an editor?

Dunn:

Yes, she does technical writing and editing. Friends of mine will have a book contract that they'll want her to go over because she's worked in publishing for a long time so she knows the ins and outs of those kinds of things. However, she's currently working at a company with engineers. So she takes their prose and makes it understandable to everybody else or takes instructions for something and makes them much clearer. She writes beautifully. In fact, one of the reasons I learned to write much better is because she would read my stuff and just say, "What is this?" It was sort of painful for the first few years. I learned to start hearing her voice when I was working and now she doesn't read my stuff much anymore. Once in a while I'll ask her to or she'll say, "Do you want me to look at that?" But for the most part I'm more confident about my own work.

Carman:

Do you have any children, if so did they attend college and what did they pursue?

Dunn:

I have two kids. My son Jacob is graduating from college this May. He went to Wheaton College in Massachusetts; it's a small liberal arts college in Norton, Massachusetts. He has lots of interests but he decided to major in music; he's a voice major and he minored in psychology. What I think he's going to do, we're not sure yet, is go to graduate school in some area of higher education. He took a higher education policy course recently and

loved it. He applied for a teaching assistantship in Austria but is still waiting to hear back. He spent the spring semester of his junior year in Vienna and loved it and wants to go back for another year then probably apply to graduate school. If he doesn't do that, there's a chance he'll stay at Wheaton and work in the admissions office, where he's worked for four years. I also have a daughter, Hannah, who's seventeen; she's a junior in high school so we're just starting the college search. She doesn't want to go to a liberal arts college necessarily, she wants something bigger. She wants to be at a university in the city and she doesn't want to stay in Pennsylvania, she's made that clear. We have encouraged them if they want to go farther away they are welcome to, but not too far.

Guthrie:

Did your point of view towards teaching change at all while your son was an undergraduate?

Dunn:

I'm not sure it did. I really worried that I would be a micromanager because I can do that with ease. So I never asked him about what courses he was thinking about taking or what he was thinking about doing because I thought I would bias him. I think, and I'm old fashioned, that students during your undergraduate years should do whatever they want. If you want to study basket weaving, knock yourself out, whatever it might be. You get to reinvent yourself, either in the workplace or in graduate school if you decide to do that. That's why I think the undergraduate experience is so important. So I don't think my view changed. I

You get to reinvent yourself, either in the workplace or in graduate school if you decide to do that. That's why I think the undergraduate experience is so important.

really was very conscious about not telling him what to do because I can so easily do that. If he asked my opinion, I would give it, but I would never say, what are you going to take next semester, how are you doing on those requirements, are you keeping up on that? I didn't do that in contrast to high school. I said to both of them, I will drive you absolutely crazy in high school but then you're on your own unless you want to ask. I really worry that parents can be too intrusive. They want the best for you but their best for you is not necessarily the best for you. And it's so hard not to do that but I really try not to.

Carman:

So how have you balanced your work life with your home life?

Dunn:

Horribly. I changed when I first started because the work was so demanding because I didn't know what I was doing. The first year or two of teaching is just brutal because you're just barely keeping ahead of where you are, it's totally new to you, you're in a new place with new people, you want to make a splash but not an embarrassing one, and you want to get your courses under control. The reality is variability happens more often when you're a teacher early rather than later. Like now I know things I'm not good at. I don't do a lot of small group work, I put students in groups to have them do group projects outside of class, but I don't do group work in class. We were encouraged at my institution to do this so I tried it and I realized I can't do that. I have to be up front or sitting in the chair talking about what we're reading, but I cannot do this move around thing and keep track of everything. To me it's just like, I might as well just go back to my office. Things like that you learn you're not good at but you don't know that early on. So I think there's a lot of variability that you smooth out. I also used to have to bring stuff home all the time. I'd do things like give two exams on the same day, which seems like a great idea but then you end up having twice as much

grading. My first ten years I probably was bringing a lot more work home. Eventually, you learn what economists call economy of scale where you know how long things are going to take and you can figure out your schedule. So I'm much more efficient. I also know when to assign things when you're laying out a syllabus. I'm home a lot more (not hiding out in my study) than I used to be. But I'm also older and I think you have to pay attention to the rhythm of your life. Also, when kids are small, they require much more attention, big surprise. That has an effect, but what seventeen-year-old wants to be told what to do? So there's a change. I guess I should rephrase my answer; it's much better than it ever was. But I think for people early in their careers it is something to be concerned about.

Guthrie:

You've talked a little bit about how you love to write and to read, but do you have any other hobbies?

Dunn:

I like to draw, sketch and paint. At one point I was thinking about art as a career but realized the world did not need another bad artist. I do that more on vacation than any other time. I like listening to jazz, I still love rock 'n' roll and classical music but the last ten years or so I've been listening to a lot of jazz. I mentioned I like architectural history so that's my pleasure reading. I like novels, I used to really like movies and I don't so much anymore. I feel like it's a commitment, you know, it's like going on a date. Do I really want to do this? It seems to me there are more movies now than ever so on the rare occasion that I go to a movie, I'm sitting there and there'll be like twenty-seven previews, because it seems like there's always twenty-seven previews. And I'll think oh I should see that, oh what about that and then I'm thinking you'll never go, and eventually it will come out on television so it doesn't matter anyway so what's the problem. I think I probably see two maybe three movies a year in the theater. I see stuff on television all the time but it's still a commitment, I

don't like Redbox because it's a commitment as well. It's like if I rent this movie am I really going to watch it? Believe it or not I also like to run, and I have three dogs that need a lot of care and feeding but I like walking them. In addition, I like to cook. I do most of the cooking in the house so I like trying out different recipes, usually more elaborate ones on the weekends.

Guthrie:

Thank you so much for taking the time to talk with us and we can all look forward to seeing the interview published in the *Journal of Psychological Inquiry*.

Psychologically Speaking

Opening Remarks to the 33rd Great Plains Students' Psychology Convention

Mark E. Ware

Founding Editor, Journal of Psychological Science

Background—Dr. Ware was affiliated with Creighton's Psychology Department for 43 years before his retirement in 2008. Dr. Ware taught a variety of courses; conducted and published research; and served on numerous department, college, and university committees, as well as on several committees of the American Psychological Association.

He was the recipient of several local and national teaching and advising awards. His publication record includes 6 edited books, 7 chapters in edited books, and 55 publications in scholarly journals. The majority of those publications had to do with issues of teaching psychology. He also sponsored numerous student research projects, presented at research conventions, and published in psychology journals. He chaired the Psychology Department during the design and construction of the Hixson-Lied Building.

During his retirement, Dr. Ware devotes time to working with stained glass. He has contributed glass artworks to several charitable organizations for fund raising auctions. He has also sold several commissioned glass pieces. Since retirement, his volunteer activity includes rehabilitation of houses, one day a week, for Habitat for Humanity – Omaha.

Bridget M. Keegan, Dean
College of Arts and Sciences
Creighton University

Thank you, Dean Keegan. I have the pleasure of giving the opening remarks at this 2013 annual Great Plains Students' Psychology Convention. In my remarks, I would like to address several questions, including what you are doing here and why, what words of wisdom I might offer, and what is the context for this Convention?

What are you doing here? I suspect the most common answer to that question would be "to present the results of my research." Okay, that is a reasonable answer. However I have a follow-up question. "Why are you presenting the results of your research?"

I contend that presenting the results of your research is part of a process of scientific, psycho-

logical inquiry. You designed a study, including literature reviews, to focus on a question, issue, or hypothesis, collected and evaluated data, and, I presume, communicated the results in writing to your faculty sponsor.

One of the hallmarks of scientific, psychological inquiry is communicating the results of an investigation to a wider audience. By participating in this Convention, you are joining the ranks of psychologists who do the same thing at their conventions. Finally, you are developing and expanding your logical thinking and spoken communications skills. Effective thinkers and communicators tend to be more successful regardless of their career paths.

Might I offer you some “words of wisdom”? If you experience nervousness or anxiety about presenting, let me assure you that such feelings are normal. Several slow deep breaths can help to reduce nervousness. By the way, I’ve never seen anyone die from nervousness associated with his/her presentations.

Second, assume that members of the audience are not critics but rather are interested to hear what you have to say. Almost no one in the audience knows about the discoveries you’ve made.

Third, as a member of the audience, be considerate of presenters. Use of cell phones or other electronic devices, including texting, during a person’s presentation can be disruptive to presenters and attendees. If the need to use such a device is too strong, think about it like smoking a cigarette and go outside!

Finally, I heartily encourage you to attend the keynote presentation this evening at about 7:00 in this room. Attendance at the preceding banquet is not required. The eminent Dr. Sheldon Solomon from Skidmore College will present “Grave Matters: On the Role of Death in Life.”

Another question I’d like to address is this. What is the context or history of this Convention? The first Convention was held at Emporia State University in 1981. Do you realize that there are some faculty members in attendance who hadn’t even started elementary school when the Convention started?

The name of the Convention has changed over the years. Initially, the Convention was called the Kansas Students’ Contributions to Psychology Convention and Paper Competition. Because of the increasing number of presentations by students from Nebraska and Missouri, the name was modified in 1988 to the Kansas/Great Plains Students’ Psychology Convention. And two years later, organizers changed the name to what it’s called today. If memory serves me, over the ensuing years, students from Iowa, Oklahoma, Texas, Colorado, and Wyoming have also given presentations.

My involvement with the Convention began in the mid-1980s when I attended as an observer. A year later, I sponsored the first presentation by Creighton students.

What was the stated goal of the Convention?

According to Emporia State University’s Dr. Steve Davis, who was the founder of the Convention, the goal for the Convention was “to provide a forum for psychology students . . . to exchange ideas, discuss relevant topics, and gain experience presenting papers” (Davis, 2013).

How might we evaluate the success of the founder’s stated goal? Contrast the first year of the Convention with this year’s: the Convention’s first year had 19 oral presentations; by my count, this year’s has 80 oral plus 60 poster presentations. As an aside, the first poster presentations did not appear until the 10th Convention held at Missouri Western State College (now University) in 1990.

There were eight colleges and universities represented in the first year of the Convention, and all were from one state - Kansas; there are 26 colleges and universities represented in this year’s, and they represent five states. A greater number of presentations and institutions characterize the evolution of the Convention.

Additional evidence for the widespread influence of the Convention is reflected in the number of departments hosting the Convention. Departments from 19 colleges and universities have either hosted or co-hosted the event. Emporia State University’s department tops the list by hosting the Convention eight times, followed by the University of Nebraska at Kearney four times, and Missouri Western State University three times.

A final indicator of the Convention’s impact emerged at the 1994 Convention in Kansas City and hosted by Rockhurst College (now University). A small group of psychology educators asked a meeting of psychology faculty about their interest in supporting the creation of a journal. The plan was that the journal would review submissions from Convention presentations and consider them for publication. Publication of research is the culmination of the process of scientific, psychological inquiry. Faculty support for the plan was virtually unanimous.

In 1996, the first issue of the *Journal of Psychological Inquiry* (JPI) appeared. Currently, JPI is the only journal that publishes exclusively undergraduate students’ research and uses psychology faculty as reviewers and editors! (For a more extensive account of JPI’s history refer to Ware, 1996; Ware, 2007).

I served as the journal's managing editor for the first 12 volumes, through 2007. Currently, Dr. Jennifer Bonds-Raacke and Dr. John Raacke from Ft. Hays State University are the managing editors. I strongly encourage you to seek your faculty sponsor's support in revising your Convention presentation and submitting it to JPI for review. Today need not be the last step in your scientific, psychological inquiry. Details about submitting to JPI are available in the electronic versions of the Convention program on pages 60-63.

In summary, I have addressed several questions, including what you are doing here and why, what words of wisdom I might offer, and what is the context for this Convention? Now, let's begin the process for why you are here! Thank you for your kind attention.

References

- Davis, S. F. (2013). A history of the Great Plains Students' Psychology Convention. Retrieved from <http://www.greatplainsconvention.com/convention-history.html>
- Ware, M. E. (1996) Editorial. *Journal of Psychological Inquiry*, 1, 4.
- Ware, M. E. (2007). Editorial – Journal history. *Journal of Psychological Inquiry*, 12, 55.

Journal of Psychological Inquiry

Call for Papers

The *Journal of Psychological Inquiry* (JPI) encourages undergraduate students to submit manuscripts for consideration. Manuscripts may include:

- *Empirical studies*
- *Literature reviews*
- *Historical articles*
- *Special Features I: Evaluating controversial issues*. Two students work together on different facets of the same issue.
 - Select a controversial issue relevant to an area of psychology (e.g., Does violence on television have harmful effects on children?—developmental psychology; Is homosexuality incompatible with the military?—human sexuality; Are repressed memories real?—cognitive psychology). Each student addresses the current empirical research and makes a persuasive case for one side of the argument.
- *Special Features II: Conducting psychological analyses- Dramatic*. This manuscript is a psychological analysis of a television program or movie.
 - Television program: select an episode from a popular, 30-60 min television program, describe the salient behaviors, activities, and/or interactions, and interpret that scene using psychological concepts and principles. The presentation should identify the title of the program and the name of the television network. Describe the episode and paraphrase the dialogue. Finally, interpret behavior using appropriate concepts and/or principles that refer to the research literature.
 - Analyze a feature film for psychological content. Discuss the major themes but try to concentrate on applying some of the more obscure psychological terms, theories, or concepts. Briefly describe the plot and then select key scenes that illustrate one or more psychological principles. Describe how the principle is illustrated in the movie and provide a critical analysis of the illustration that refers to the research literature.
- *Special Features III: Conducting psychological analyses- Current events*. By using the perspective of any content area in psychology, this manuscript analyzes a current event.
 - Example 1: Several psychological theories could be used to describe people's reactions to the destruction of the World Trade Center on September 11, 2001. Terror management research has often shown that after reminders of mortality people show greater investment in and support for groups to which they belong and tend to derogate groups that threaten their worldview (Harmon-Hones, Greenberg, Solomon, & Simon, 1996). Several studies have shown the link between mortality salience and nationalistic bias (see Greenberg, Simon, Pyszczynski, & Solomon, 1992). Consistent with these findings, the news reported that prejudice towards African Americans decreased noticeably after 9/11 as citizens began to see all Americans as more similar than different.

- Example 2: A psychological concept that could be applied to the events of September 11 would be that of bounded rationality, which is the tendency to think unclearly about environmental hazards prior to their occurrence (Slovic, Kunreuther, & White, 1974). Work in environmental psychology would help explain why we were so surprised by his terrorist act.
- *Special Features IV: Teaching techniques*- Student and faculty mentor collaborate on this manuscript regarding a teaching technique the faculty member uses that the student found particularly helpful.
 - Some examples of teaching techniques are interteaching, the use of clickers, podcasting, team-based learning, and reflective journaling. The description should contain enough information so that another teacher could use the technique and should provide reasons why you think the technique worked well. The second half of the paper should be written by the faculty member who can explain why he or she chose the technique you found to be effective, and what they hoped to accomplish in terms of learning outcomes by using the technique.

Manuscripts may cover any topical area in the psychological science. Further details for the special features submission can be found at the end of volume 18 (1), available at: <http://www.fhsu.edu/psych/jpi/>

Submission Details:

1. Manuscripts must have an undergraduate as the primary author. Manuscripts by graduates will be accepted if the work was completed as an undergraduate. Graduate students or faculty may be co-authors, if their role was one of teacher or mentor versus equal collaborator.
2. Manuscripts must come from students who meet the following conditions: (a) from students at institutions who are current on their financial annual support of JPI (see list on JPI website), (b) from students at institutions who are willing to pay an \$80 annual processing fee for unlimited submissions, or (c) from students who pay a one-time \$30 processing fee to have a single submission processed.
3. Submit original manuscripts only. Do not submit manuscripts that have been accepted for publication or that have been published elsewhere.
4. All manuscripts should be formatted in accordance with the APA manual (latest edition).
5. Submissions are made online at <http://www.edmgr.com/jpi>.
6. Ordinarily, the review process will be completed in 30 to 60 days.
7. If a manuscript requires revisions, the author(s) is (are) responsible for making the necessary changes and resubmitting the manuscript to the Journal. Sometimes you may have to revise manuscripts more than once.
8. For further submission guidelines, see the JPI website at <http://www.fhsu.edu/psych/jpi/> or contact Dr. Jenn Bonds-Raacke (jmbondsraacke@fhsu.edu) or Dr. John Raacke (jdraacke@fhsu.edu).