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KJUS



Kentucky Journal of Undergraduate Scholarship

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KJUS: Kentucky Journal of Undergraduate Scholarship

Issue 5 2021

Editor’s Introduction.....iv
Dr. Jonathan Gore

LIFE SCIENCES

Effect of Her2 Expression on Nup12 Protein in Cervical Cancer Cells.....1
Mary E. Eichholz, Margaret J. Ballou, Tristan J. Haight, Jennifer L. Minton, Ryan N. Oates, & Jacob J. Adler

SOCIAL SCIENCES

The Importance of Culture-Fit for Remembering Church Sermons.....6
Emily Adkins, Madelyn B. McKnight, & Jonathan S. Gore

Decisions Are More than Skin Deep: Exploring Correlations between Self-Esteem and the Decision to Have Bariatric Surgery.....17
Penny Fox & James Maples

Different Hollers, Different Outcomes: Differences in Health Outcomes among Appalachian and Non-Appalachian Counties in Kentucky.....25
Alexys Krasnopolsky & James N. Maples

The Economic Impact of Paradise Cove Aquatic Center in Richmond, Kentucky.....32
Lauren Kilburn, Michael Bradley, & James Maples

APPLIED SCIENCES

Social or Special Interests: How Unions Influence Spending.....37
Devon Moffett & Shauna Reilly

Collegiate Athletic Fans Perception of the Use of Social Media in Marketing.....45
Anna K. Gdovka & Steve Chen

Call for Papers.....50

Paper Guidelines.....51

Submission Process.....53

Review Process.....54

Letter from the Editor

Greetings!

I am pleased to bring to you the fifth issue of the Kentucky Journal of Undergraduate Scholarship. I am also very pleased to see the growth and reach of KJUS from the past four years; the articles from the first four issues have been downloaded over 28,000 times in over 150 countries across the world! We look forward to our continued success in showcasing the best work of our undergraduate students across the Commonwealth of Kentucky.

The fifth issue of KJUS contains some of the most diverse topics to date. The articles provide some new insights into cancer research, how people respond differently to a sermon depending on their cultural values, how self-esteem and region relate to health outcomes, the economic impact of a water park in Richmond, how unions relate to government spending, and how sports fans respond to online marketing. We also have a diverse array of institutions represented in Issue #5, including research teams from Brescia, ECU, NKU, and Morehead.

I would like to acknowledge my Graduate Assistants, J.P. Ferraro and Jordan Organ, who have dedicated many long hours to making sure each article was polished and presentable. Laura Edwards served as the consultant and contact throughout the process. I would like to thank the associate editors and reviewers for volunteering their time to evaluate the rigor and validity of each submission. Finally, I would like to thank the students and their mentors for continuing to provide us with high quality work that continues to amaze me. I look forward to directing this journal's continued purpose as a repository of academic excellence.

Jonathan S. Gore, Ph.D.

Editor-in-Chief

Effect of Her2 Expression on Nupl2 Protein in Cervical Cancer Cells

Mary E. Eichholz, Margaret J. Ballou, Tristan J. Haight,
Jennifer L. Minton, Ryan N. Oates, & Jacob J. Adler
Brescia University

Abstract: *Recurring cervical cancer patients frequently present overexpressed Human Epidermal Growth Factor Receptor 2 (HER2) protein, which promotes the growth of the cancer. Some HER2-expressing cells and cervical cancer patients have enhanced gene expression of Nucleoporin-like 2 (NUPL2). As part of the nuclear pore complex, the NUPL2 protein serves to selectively export substances from the nucleus to the cytoplasm. In this experiment, HER2 was expressed in cervical cancer cells to examine its effect on NUPL2 protein expression and localization. Interestingly, there was no difference in NUPL2 protein levels between HER2-expressing and non-expressing cells. Importantly, consistent instances of NUPL2 protein localization specific to the nucleus occurred in a large sampling of HER2-expressing cells. This is significant because it suggests a mechanism as to how HER2 promotes excessive cell growth, via changes in NUPL2 localization, potentially impacting its function and ability to selectively export substances that modulate cell growth.*

Keywords: *HeLa Cells, nucleoporins, nucleus, immunoblot, immunofluorescence*

Cervical cancer is the fourth leading cause of cancer deaths in women worldwide (Bray et al., 2018). Frequently, patients with recurring cervical cancer have highly expressed Human Epidermal Growth Factor Receptor 2 (HER2) protein (Chavez-Blanco et al., 2004), a documented powerful cancer driver (Moasser, 2007). Many types of cancers are promoted by deregulating cellular nucleoporins, which are proteins of the nuclear pore complex involved in the transportation of gene transcripts, regulation of transcription, and chromatin access (Köhler & Hurt, 2010; Kau et al., 2004). Importantly, one of these nucleoporins, *Nucleoporin-like 2 (NUPL2)*, shows enhanced gene expression in HER2-positive breast cancer cell lines and tissues (Kalari et al., 2013; Wilson et al., 2002). No published data sets exist comparing HER2-positive cervical cancers and *NUPL2* gene expression; however, cervical cancer patient samples do present significantly higher *NUPL2* gene expression compared to control samples via microarray analysis (Long et al., 2017). Additionally, the RNA transport pathway (of which *NUPL2* protein is a member) was found to be a key mechanism involved in the initiation, progression, and metastasis of cervical cancer (Long et al., 2017).

Interestingly, the *NUPL2* gene is amplified in 1% of cervical cancer patients and shows higher gene expression levels compared to controls according to cBioPortal for Cancer Genomics (Cerami et al., 2012; Gao et al., 2013). However, cervical squamous cell carcinoma patients show no significant difference in *NUPL2* gene expression between cancer grades,

stages, nor survival according to UALCAN web-portal (Chandrasekhar et al., 2017). Together, these large data set studies have suggested a possible link between HER2 expression and *NUPL2* protein in cervical cancer, but this connection has not been reported. Based upon the data independently demonstrating cervical cancer and HER2-expression changes to gene expression of *NUPL2*, and the importance of *NUPL2* localization for its function, here we examined the protein levels of *NUPL2* with immunoblot and its localization via immunofluorescence in response to HER2 overexpression in HeLa cells. In the current study, we sought to examine whether the expression of HER2 could modify the protein expression, or the location of *NUPL2* protein, or both, and as a result, could impact the transport, regulation, and access of genes involved in cancer growth.

Method

Cell Culture

HeLa cells were grown in DMEM with Glutamax (Gibco 10565018) supplemented with Fetal Bovine Serum (10%) (FBS) (Atlanta Biologicals) and Antibiotic-Antimycotic (Gibco 15240062). For immunoblot experiments, cells were plated at 70,000 cells/well on a 6 cm plate. For immunofluorescence experiments, cells were plated at 10,000 cells/well on an 8-well chamber slide. For both experiments, cells were grown for 24 hours. Plasmid DNA, either control pcDNA3.1-EGFP or

pERBB2-EGFP (Addgene plasmid # 39321), was transfected with Lipofectamine 3000 (ThermoFisher Scientific L3000001) via manufacture instructions. Cells were allowed to grow for 24 hours then used for assays.

Immunoblot

HeLa cells on 6 cm plates were washed twice with phosphate buffered saline (PBS) on ice and scraped into a microcentrifuge tube. Cells were microcentrifuged at 4 °C at 600 X g for 2 minutes and then the supernatant was discarded. The cell pellets were resuspended with a RIPA lysis buffer (50 mM Tris-HCl pH 7.4, 1% NP-40, 0.5% Sodium-deoxycholate, 0.1% SDS, 150 mM NaCl, 2 mM EDTA pH 8.0, 50 mM NaF) supplemented with a protease inhibitor cocktail (Sigma S8820-2TAB) then passed 50 times with a P200 micropipette. Samples were placed on dry ice for 2 minutes, then removed from dry ice and warmed quickly. Samples were passed 50 times again with a P200 micropipette and placed back on dry ice for 2 minutes. Samples were warmed quickly and then placed on ice for 10 minutes. Samples were microcentrifuged at 4 °C for 10 minutes at 20,000 X g. The supernatant was removed and used with common SDS-PAGE and liquid transfer of proteins on nitrocellulose protocols. Anti-GFP antibody (Sigma G6539) was used at a 1:1000 dilution in PBS-Tween. Anti-NUPL2 antibody (Abcam EPR16545) was used at a 1:1000 dilution in PBS-Tween. Anti-GAPDH antibody (Cell Signaling 5174T) was used at a 1:1000 dilution in PBS-Tween. All antibodies were incubated with nitrocellulose blots overnight on a rocking platform at 4 °C. Anti-Rabbit and anti-Mouse IgG HRP-linked antibodies (Cell Signaling 7074 and 7076) were used at 1:1000 dilutions and incubated at room temperature for 30 minutes on a rocking platform. HRP Conjugate Substrate Kit (BioRad 1706431) was used to detect HRP secondary antibodies via manufacturer directions. Images were acquired using the gel imaging system (BioRad Gel Doc 2000 Chemi Doc 1708126).

Immunofluorescence

HeLa cells on chamber slides were fixed with a 4% paraformaldehyde solution in PBS for 10 minutes at room temperature. Cells were then permeabilized with a 0.5% Tween-20 in PBS solution for 10 minutes at room temperature. Finally, cells were blocked in a 3% Goat Serum (Sigma G9023) in PBS overnight at 4 °C. Prior to each step above, cells were washed 3 times for 3 minutes each with PBS. Fixed cells were then incubated with the primary antibody NUPL2 (Abcam

EPR16545) diluted 1:100 in 3% Goat Serum for 1 hour at 4 °C. Secondary antibody Goat anti-Rabbit Alexa Fluor 594 (ThermoFisher R37177) was diluted 1:500 in 3% Goat Serum and incubated for 30 minutes at 4 °C in dark. DAPI Stain (Chemical FL 341 Blue) (Pierce 62248) was diluted to a final concentration 1 µg/mL and applied to each well for 8 minutes at room temperature in dark. Between each step above, wells were washed 3 times with PBS. Chamber slides were dismantled and washed twice gently with ultrapure water. Slides were dried and mounted with coverslips with ProLong Glass Antifade Mountant (Invitrogen P36982) per manufacturer directions. Slides were imaged using the EVOS FL imaging system (Life Technologies). EVOS LED GFP light cube (AMEP4651) was used to analyze GFP-expressing HeLa cells. EVOS LED TexasRed light cube (AMEP4655) was used to analyze NUPL2/Alexa Fluor 594. EVOS LED DAPI light cube (AMEP4650) was used to analyze DAPI Stain. Analysis of immunofluorescence data was completed using ImageJ (<https://imagej.nih.gov/ij/download/>).

Results

Since several studies indicate changes to *NUPL2* gene expression in HER2-positive breast samples (Kalari et al., 2013; Wilson et al., 2002), and in cervical cancer patients (Long et al., 2017), the protein levels of NUPL2 were examined via immunoblot. NUPL2 protein levels remained unchanged between HER2-expressing and non-expressing HeLa cells (Figure 1). This indicates an inability for high levels of HER2 to compromise the normal protein expression or stability of NUPL2 in these cells.

Previous work showed that NUPL2 protein localized primarily around the nucleoplasm, and some cytoplasmic staining in HeLa cells according to The Human Protein Atlas (Thul et al., 2017). NUPL2 presents its functionality in the nucleus as a part of the nuclear pore complex (Köhler & Hurt, 2010); thus immunofluorescence was used to examine the localization of NUPL2 in HER2-expressing cells (Figure 2). Importantly, NUPL2 localized within the nucleus in 65% of cells expressing HER2 (N = 100), compared to just 20% access in the non-expressing cells (N = 180) (Table 1). Interestingly, only in HER2-expressing cells did NUPL2 exclusively localize to the nucleus. There was a decreased corresponding 56% change in cytosolic localization of NUPL2 in the HER2-expressing cells compared to non-expressing cells. Together these data indicate a change in localization of NUPL2 more towards the nucleus in HER2-expressing cells.

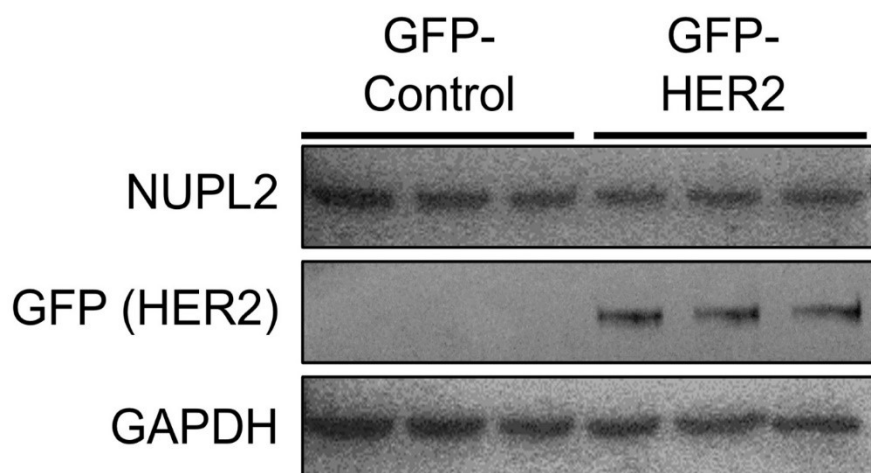


Figure 1. Immunoblot detection of NUPL2 protein in HER2-expressing HeLa cells. HeLa cells transfected with GFP-tagged vector control or with GFP-tagged HER2 were then harvested for protein and used for immunoblot using antibodies specific for NUPL2, GFP, and GAPDH. Three independent samples are provided per condition.

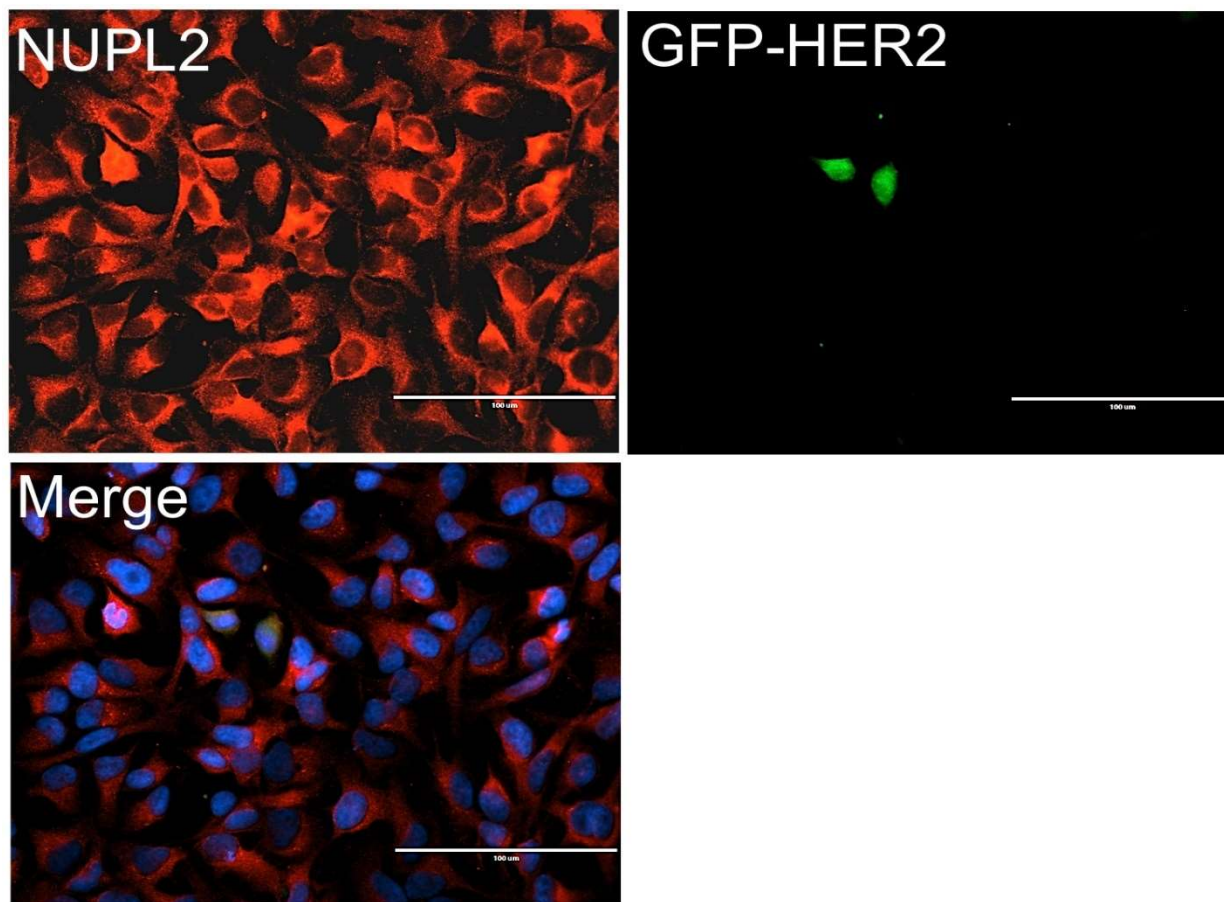


Figure 2. Immunofluorescence detection of NUPL2 protein in HER2-expressing HeLa cells. HeLa cells transfected without or with GFP-tagged HER2 (green) using an antibody for NUPL2 (red). Cells were co-stained for nuclei (blue) in overlay with the other two channels (merge).

	<i>Nucleus Only</i>	<i>Both</i>	<i>Cytosol Only</i>
Control (N = 180)	0 %	20 %	80 %
HER2 (N = 100)	14 %	51 %	35 %

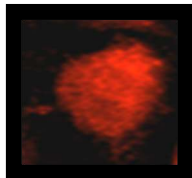
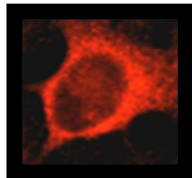
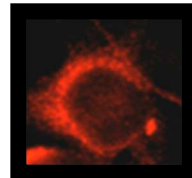




Table 1. NUPL2 localization in HER2-expressing HeLa cells. The quantification of localization of NUPL2 (red) in HeLa cells transfected without (Control) (N = 180 cells) or with HER2 (N = 100 cells). Cells were analyzed by three separate investigators in the blind. Nucleus Only = residing visibly only in nucleus; Cytosol only = residing visibly only outside the nucleus; Both = residing visibly in and out of the nucleus. Representative images of NUPL2 localization for each group are provided.

Discussion

Prior to this investigation, there were no published studies examining the impact of HER2 expression on NUPL2 protein in any cell line. In fact, in cervical cancer cells, NUPL2 protein levels and localization have only been reported previously in HeLa cells found on (Abcam EPR16545) and The Human Protein Atlas (Thul et al., 2017), and not in cervical cancer cell lines expressing high HER2 (SiHa, C33A, CaSki) (Narisawa-Saito et al., 2006). Future studies on HER2 in cervical cancer might examine these cell lines with higher HER2 expression for NUPL2 protein to see if there are relative change in basal levels. This study is the first to characterize the role of HER2 expression on NUPL2 protein with immunoblot and immunofluorescence data. The data clearly demonstrates that expression of HER2 does not influence the protein levels of NUPL2 in HeLa cells. This is critical information for the field, as previous studies demonstrated a change in the *NUPL2* gene expression levels in HER2-positive breast tissues via cDNA microarray and RNA-Seq data sets (Wilson et al., 2002; Kalari et al., 2013) and in cervical cancer patient samples (Long et al., 2017). It is likely that other unknown tissue- and organ-specific factors such as hormones or post-translational processing may be important to the regulation of NUPL2 protein production, of which HER2 may be a corresponding factor.

The immunofluorescence data paints an intriguing role of HER2 expression in the localization of NUPL2 protein. Studies have shown that when NUPL2 protein and other nucleoporins are deregulated, these proteins function to promote cell growth and cancer proliferation (Nofrini et al., 2016). The localization change of NUPL2 to the nucleus suggests that HER2 expression could impact the functionality of NUPL2 in HeLa cells. Interactome enrichment studies have shown that other nucleoporins could be deregulated in HER2-positive tumors (Kalari et al., 2013; Long et al., 2017). In conclusion, these findings provide initial information about the relationship between NUPL2 protein and HER2 expression in cells. This data provides the foundational knowledge to explore NUPL2 and other nucleoporins and isolate their relationships in HER2-positive recurring cervical cancer patients. Perhaps NUPL2 could indicate a viable mechanistic target for understanding and unlocking new nucleoporin-related gene therapy options.

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The Importance of Culture-Fit for Remembering Church Sermons

Emily Adkins, Madelyn B. McKnight, & Jonathan S. Gore
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Abstract: *This experiment tested the degree to which culture-fit influences memory for the content of a sermon. We hypothesized that people who read a sermon emphasizing the infallibility of Christian scriptures will remember it more accurately if they have collectivistic rather than individualistic values. In contrast, we hypothesized that people who read a sermon emphasizing the subjectivity of Christian scriptures will remember it more accurately if they have individualistic rather than collectivistic values. Participants (n = 270) were randomly assigned to read either an orthodox- or quest-oriented sermon regarding Peter 1:20-21. They then completed a true-false memory test as to whether or not statements were in the sermon they read. Later, they completed an online survey of their cultural values and beliefs. Results indicated that highly collectivistic individuals' memories were negatively affected in the Quest Condition, but not in the Orthodox Condition. Implications for the culture-fit of religious information are discussed.*

Keywords: memory, schema, religion, quest, orthodox, culture

Memory is an invaluable part of human life. Indeed, it is utilized every day, from adhering to deadlines to remembering a wedding anniversary. Important knowledge is taken and stored, then recalled for future use. Some environments, however, allow for better memory processing than others, including stimuli that fit one's cultural framework. For example, people with highly independent values are less susceptible to misinformation from others than people with highly interdependent values (Peterson & Paterson, 2012). To date, however, no one has examined how culture-fit memory processes may occur within religious contexts. The purpose of this experiment was to examine how memory is affected by one's own cultural background and the fit of new stimuli, specifically in the context of a church sermon.

Many different factors can effect memory. Some effects are based upon the characteristics of the information being stored, such as the type of stimulus (Craik & Schloerscheidt, 2011; Sato & Yoshikawa, 2013). Other effects involve factors surrounding the information, such as if an environment is real or simulated, if an environment is familiar or not, or if any other sensory distractions are present (Allen, Baddeley, & Hitch, 2017; Rule, Garrett, & Ambady, 2010; Tamplin, Krawietz, Radvansky, & Copeland, 2013). Memory can even be affected by personal circumstances, such as if someone uses nicotine or how much stress a person experiences (Grobe, Perkins, Goettler-Good, & Wilson, 1998; Ramirez, McDonough, & Jin, 2017). Negative emotional states are also detrimental to working memory capacity (Brose, Schmiedek, Löven, & Lindenberger, 2012; Ellis & Ashbrook, 1988; Meinhardt & Pekrun, 2003; Spachholz, Kuhbandner, & Pekrun, 2014; Spies, Hesse, & Hummitzsch, 1996).

Another factor that impacts memory is whether information is aschematic (also called schema-inconsistent) or schema-consistent. Extant literature, however, is contradictory when considering the direction of this effect. Some studies suggest that aschematic information is better recalled because it contrasts against the established schema and is therefore more salient (e.g., Koppel & Berntsen, 2014). In contrast, other research suggests that schema-consistent information is recalled better than aschematic information because the subject matter is more fully integrated into existing memory (Gronau & Shachar, 2015; Silva, Groeger, & Bradshaw, 2004). Another area of research focuses on how schemas influence false memories in social situations, such as eyewitness accounts or observations of others. When observing and reporting information about a social interaction, people tend to report that schema-consistent events occurred when they did not (Nemeth & Belli, 2006; Tuckey & Brewer, 2003; White & Carlston, 1983).

Information can be categorized as schema-consistent or inconsistent based upon how well a particular piece of information fits with someone's understanding of the overall scene. In light of this, culture-fit may be one of the ways in which new information can be schematic or aschematic.

Culture-Fit

Culture-fit is the degree to which an individual fits within the value framework of their own culture. This may also relate to how well new stimuli fit into one's cultural framework. Culture-fit can be applied to many different subdomains culture, including socioeconomic status and nationality (Cohen, 2009).

One of the most common ways to distinguish among cultural values is by examining whether the culture adopts an

individualistic or collectivistic framework (Cohen, 2009; Friedman et al., 2010; Lau, Wang, Fung, & Namikoshi, 2014; Parkes, Bochner, & Schneider, 2001). This particular construct describes an important cultural distinction between how self-focused or group-focused the members of the culture tend to be (Cohen & Hill, 2007; Cukur, De Guzman, & Carlo, 2004; Parkes et al., 2001). Individualism focuses on unique personal achievement and the maintenance of personal control, whereas collectivism focuses on putting group interests above personal needs and desires (Triandis, 2001).

People use cultural understanding, including their collectivistic or individualistic frameworks, as schemas to respond to environmental stimuli (Cohen & Hill, 2007). Consequently, people who experience higher levels of culture-fit may experience more positive outcomes. For instance, organizational research shows that people who fit with their company's values are more satisfied with their jobs, have more commitment to the organization, and earn tenure more often than those who have lower levels of culture-fit within their workplaces (Parkes et al., 2001). Additionally, individuals consider information to be more persuasive when it fits into their cultural values than when it does not (Uskul & Oyserman, 2010; Vaidyanathan, Aggarwal, & Kozłowski, 2013).

In contrast, not fitting into the predominant culture can lead to negative outcomes. For example, second-generation Asian American students who are raised in bicultural households experienced higher levels of social anxiety when exposed to a highly individualistic culture in college (Lau et al., 2014). Asian American exchange students can also experience symptoms of depression when they began to perceive cultural distance between themselves and the culture of the United States (Friedman et al., 2010). Similar instances of culture-fit within faith communities, however, are rarely examined. The following section outlines how variations in Christianity and corresponding attitudes may be explained through culture-fit.

Culture-Fit and Christianity

Research concerning religion and culture often notes the overlap between the two constructs (Cohen, 2009; Cohen & Hill, 2007; Cukur et al., 2004). Researchers often suggest that religion is another subdomain of culture, similar to individualism-collectivism and nationality (Cohen, 2009). Many religious orientations clearly have direct links with individualism or collectivism. For instance, people who adhere to Judaism often hold highly collectivistic values, whereas Protestant-Christians hold highly individualistic ones (Cohen, 2015). Cohen and Hill (2007) also discovered similar findings in which American Catholic and Jewish individuals had more collectivistic aspects of religion and spirituality, while American Protestants had more individualistic aspects. Even so, there can be considerable variation within denominations.

One example is whether religious practice emphasizes literalism or open interpretation, which are related to orthodox and quest religious orientations respectively (Allport & Ross, 1967; Altemeyer & Hunsberger, 1992; Batson, Naifeh, & Pate, 1978; Reinert & Bloomingdale, 2000; Watson, Morris, & Hood, 1989). People with a highly orthodox orientation emphasize

tradition, and that there is only one correct, literal interpretation of religious texts, and doubt is unacceptable (Altemeyer & Hunsberger, 1992; Randolph-Seng, Nielsen, Bottoms, & Filipas, 2008). Quest orientation, in contrast, includes viewing religion as a journey to seek truth and consistency within one's self, where doubt and questioning are encouraged (Batson et al., 1978; Messay, Dixon, & Rye, 2012; Reinert & Bloomingdale, 2000; Watson et al., 1989).

Religious orientations can also predict psychological outcomes beyond religious contexts. Recently, Leach and Gore (2017) found that individuals who ascribed to an orthodox orientation were more likely to think primarily about the past, whereas individuals with a quest orientation were more likely to focus on long-term goals and the future. It follows then that orthodox and quest orientations thrive within supportive cultural conditions. For example, people who strictly adhere to Biblical scripture are also more likely than others to value collectivism, right wing authoritarian values, social hierarchies, and ethnocentrism (Terrizzi, Shook, & McDaniel, 2013). Ji (2004) found that intrinsic religiosity was associated with a higher level of principled moral reasoning. In contrast, people who view religion as a personal journey are more inclined than others to also value individualism (Cukur et al., 2004). Furthermore, internalizing religious and cultural values that fit well is associated with better psychological outcomes. Indeed, Gore (2015) found that people with collectivistic values tend to have higher well-being when they also possess highly orthodox Christian beliefs, but have lower well-being when they possess questing beliefs. This suggests that the culture-fit effects may be particularly pronounced among members of collectivistic cultures.

Cognitive biases are also prevalent when exposed to aschematic or challenging information about one's religious values. Yancey (2014) found that Christians engaged in confirmation biases when exposed to statements that challenged their presuppositions. This effect was similar for Atheists when they were exposed to statements that challenged their presuppositions. Thus, people with strong commitments to either religious or non-religious ideologies may be particularly vulnerable to cognitive distortions when exposed to aschematic stimuli.

Pargament and DeRosa (1985) found that individuals with an interest and positive evaluation of a religious message significantly correlated with memory for a highly religious message. These religious messages are primarily transmitted through weekly sermons during church services. The nature of sermons has long been recognized as a social psychological phenomenon (Kline, 1905), and recent analyses of sermons have demonstrated that memory for sermons is largely based upon the degree to which the listeners "open up" to the sermon in the first place (Pleizier, 2010). Cultural values would likely have a strong influence on the listeners' attunement and attention, and how much it motivates them to act in accordance with the interconnected values of their culture and the suggested actions noted in the sermon. The degree to which memory effects are

due to cognitive or motivational factors, however, has not been analyzed quantitatively.

In summary, past research has shown that aschematic stimuli are more difficult to process (Gronau & Shachar, 2015; Silva et al., 2004), but this has not been examined from the perspective of culture, nor has it been examined in the specific context of religious stimuli (e.g., a sermon). Because culture-fit influences emotional and cognitive processing, it is reasonable to conclude that culture-fit effects with religious stimuli may have similar effects. To investigate the unique cognitive effects of aschematic stimuli, it is also important to control for negative emotional reactions to those stimuli as a covariate.

This experiment examines culture-fit as a way that information can be schema-consistent or schema-inconsistent, and assesses the effects thereof. We therefore hypothesized that the association between individualism and memory would be negative when reading a sermon that is based on literalism, and positive when reading a sermon based on open interpretation. We also hypothesized that the association between collectivism and memory would be positive when reading a sermon that is based on literalism (i.e., a sermon emphasizing an orthodox orientation), and negative when reading a sermon based on open interpretation (i.e., a sermon emphasizing a quest orientation). We also expected these effects to remain significant when controlling for negative emotional reactions to the sermon to demonstrate that the effect is not due to heightened emotional arousal.

Method

Participants

The participants in this experiment were 270 undergraduate students who were enrolled in introductory psychology courses. The participants enrolled via an online research management system, and volunteered their time in exchange for course completion credit. The participants' ages ranged from 18 to 55, with the majority of participants being young adults ($M_{age} = 22.26$, $SD = 6.70$), female (79.6%), and European American (99%). Participants spent between 0 to 20 hours per week in religious activities, with the average amount of approximately the length of a formal religious service ($M = 1.51$, $SD = 2.12$). Most participants in the sample identified as Christian (80%), with 3% identifying as religious but not Christian, and 17% identifying as having no religion or atheist.

Materials

Sermons

For the first part of this experiment, participants were randomly assigned to read either a quest-orientation sermon or an orthodox-orientation sermon. Each sermon was approximately 1270 words and focused on 1 Peter 1:20-21 which states, “²⁰Above all, you must understand that no prophecy of Scripture came about by the prophet’s own interpretation of things. ²¹For prophecy never had its origin in the human will, but prophets, though human, spoke from God as they were carried along by the Holy Spirit.” Both sermons asserted that the Bible can be understood and use other supporting verses to emphasize their claims.

For the Orthodox Condition, the sermon emphasized that there is only one correct interpretation of scripture, and that the Bible is the inerrant word of God (McArthur, 1990). This sermon included definitive language that leaves little room for argument (e.g., “So, God superintended human authors so that using their own individual personalities, experiences, thought processes and vocabulary, they composed and recorded without error His perfect revelation in the original copies of Scripture.”). The full text of the sermon presented to participants is in Appendix A.

For the Quest Condition, the sermon states that 1 Peter 1:20-21 is often misinterpreted to mean that people should never consider an individual’s interpretation of the Bible (McClister, 2004). It states that this scripture does not address personal interpretation, but rather the claims of Old Testament prophets (e.g., “Interpretation is unavoidable when handling the Bible, and the early Christians themselves were interpreters (whose interpretation was viewed as radical by the Jews) of the Jewish Scriptures.”). The conclusion of this sermon was that the Bible allows room for exploration and doubt in its audience. The full text of the sermon presented to participants is in Appendix B.

Memory

After completing the reading, participants responded via a reaction form. They were asked 10 true/false questions based on the sermon. Participants were asked to indicate if a particular statement was a part of the sermon or not. Five of the statements came from the Orthodox sermon, and five came from the Quest sermon. Correct answers were coded depending on the condition to which participants were assigned. Total Memory scores therefore ranged from 0 - 10, with higher scores indicating a better memory for what they read or did not read from the sermon. We created additional subscores noting the number of hits, misses, false positives, and correct rejections for each condition. Collected scores were Total Memory ($M = 7.87$, $SD = 1.40$), Hits ($M = 3.98$, $SD = 0.85$), Misses ($M = 1.02$, $SD = 0.85$), False Positives ($M = 1.09$, $SD = 1.10$), and Correct Rejections ($M = 3.89$, $SD = 1.12$) for each participant. Higher scores on Total Memory, Hits, and Correct Rejections indicated better memory for the sermon’s content, whereas higher scores on Misses and False Positives indicated worse memory for the content.

Emotional Reaction

The participants also completed a survey that measured the degree of which participants experienced negative emotions while reading the sermon. Participants were asked to rate the degree to which they experienced the particular emotion (e.g. “Frustration”) while reading the sermon on a 5-point Likert scale (1=*not at all*, 5=*extremely*). The mean rating across the items was obtained for the Negative Emotions score ($M = 1.44$, $SD = 0.54$, $\alpha = .74$).

Individualism and Collectivism

Participants completed ten items online to assess their values of individualism and collectivism. Two items from the Individual Value scale (Brockner & Chen, 1996), two items from Chen, Brockner, and Chen’s (2002) Individual Agency Belief subscale, and one item from their Individual Self-Representation subscale were used to assess individualism. Five items from Chen et al.’s (2002) Group Value subscale were used to assess

collectivism. Participants responded to the items using a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). The mean rating across the individualistic items was obtained for the Individualism score ($M = 3.82, SD = 0.46, \alpha = .75$), and the mean rating across the Group Value items was obtained for the Collectivism score ($M = 3.37, SD = 0.46, \alpha = .73$).

Procedure

This experiment was conducted in two parts. In the initial step, participants arrived at the laboratory, provided consent, then were randomly assigned to read one of two sermons. The experimenter told the participant that the transcript was from a sermon that was given by a preacher at a new, local church. Participants were instructed to read it very carefully and to take their time reading it. After reading the sermon, participants handed the transcript back to the experimenter then completed the true/false memory test.

In step two, participants completed an online questionnaire approximately one week later. This survey asked about their cultural values, along with demographic information. At the end of the survey, participants read a debriefing statement that explained both parts of the experiment.

Results

This experiment tested two hypotheses. We first hypothesized that individuals who read a sermon based on literalism would remember sermon content more accurately if they had collectivistic values rather than individualistic values. Secondly, we hypothesized that people who read a sermon based on open interpretation would remember information in the sermon better if they had individualistic values rather than collectivistic values. To determine if these hypotheses were supported, we conducted a series of hierarchical regression analyses.

For the first set of analyses, we entered the centered Individualism scores and dummy-coded condition score (0 = Orthodox, 1 = Quest) as the independent variables in Block 1, their interaction term was added in Block 2, and Negative Emotions was entered into Block 3. Each analyses used a different memory variable as the dependent variable: Total Correct, Total Hits, Total Misses, False Positives, and Correct

Rejections (see Table 1). The results indicated main effects of Condition for Total Memory, Hits and Misses. The results also revealed main effects of Negative Emotions on all five memory scores, namely that negative emotions were detrimental to the memory for the sermon. There were also two significant Individualism X Condition interaction effects on False Positives and Correct Rejections.

Follow-up analyses indicated that the simple slope between Individualism and False Positives was negative in the Orthodox Condition, and non-significant in the Quest Condition (see Figure 1). Conversely, the simple slope of Individualism and Correct Rejections was positive in the Orthodox Condition, and non-significant in the Quest Condition (see Figure 2). Taken together, these results disconfirmed the first hypothesis, because the hypothesized interaction effect was in the opposite direction.

For the second set of analyses, we entered the centered Collectivism scores and dummy-coded condition score (0 = Orthodox, 1 = Quest) as the independent variables in Block 1, their interaction term was added in Block 2, and Negative Emotions was entered into Block 3. The five memory scores (Total Correct, Total Hits, Total Misses, False Positives, and Correct Rejections) were entered as the dependent variables (see Table 2). The results revealed the same main effects of Condition and of Negative Emotions from the first set of analyses. There were also two significant main effects of Collectivism on False Positives and Correct Rejections, suggesting that collectivism is linked with more false positives and less correct rejections in both conditions. There were also three significant Collectivism X Condition interaction effects on Total Memory, Hits, and Misses.

Follow-up analyses indicated that the simple slopes of Collectivism with Total Memory, Hits, and Misses were all non-significant in the Orthodox Condition, but the simple slope of Collectivism with Total Memory and Hits were negative, and the simple slope of Collectivism with Misses was positive, in the Quest condition (see Figures 3-5). Taken together, these results confirmed the second hypothesis: highly collectivistic individuals had more memory errors when reading the sermon regarding open interpretation of the Bible.

Predictor Variables	Total Memory		Hits		Misses		False Positives		Correct Rejections	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Block 1		.02*		.10**		.09**		.00		.00
Condition	-.14**		-.31**		.30**		-.05		.06	
Individualism	.06		.04		-.04		-.05		.04	
Block 2		.00		.00		.00		.01*		.01*
Condition	-.14**		-.31**		.30**		-.05		.06	
Individualism	.07		.02		-.02		-.03		.02	
Condition X Individualism	-.08		.04		-.05		.13*		-.13*	
Block 3		.06**		.03**		.03**		.03**		.03**
Condition	-.14**		-.31**		.31**		-.04		.06	
Individualism	.08		.01		-.01		-.03		.02	
Condition X Individualism	-.08		.04		-.04		.13*		-.13*	
Negative Emotions	-.25**		-.18**		.18**		.17**		-.18**	

Table 1. Hierarchical Regression Analyses of Individualism and Sermon Condition on Memory. Note. * $p < .05$, ** $p < .01$

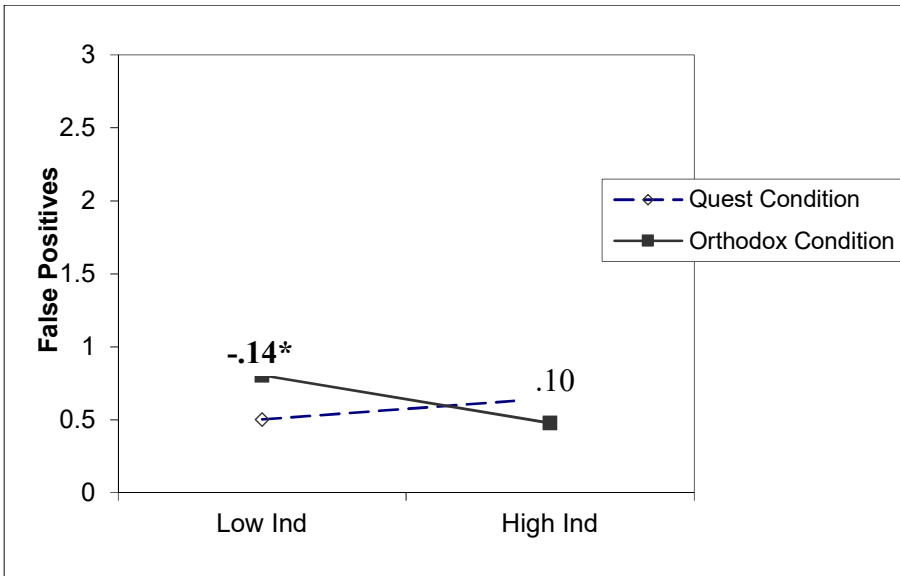


Figure 1. Simple Slopes of Individualism X Condition Predicting False Positives

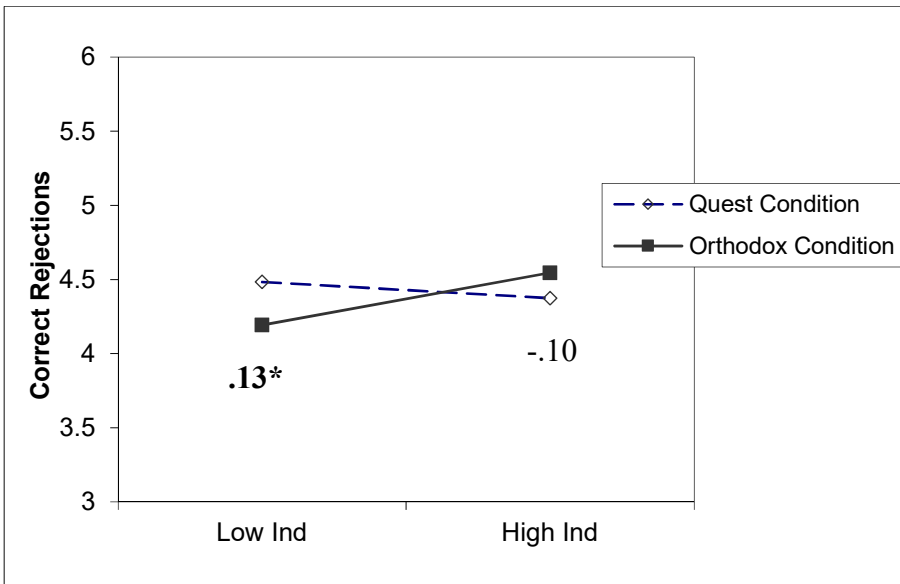


Figure 2. Simple Slopes of Individualism X Condition Predicting Correct Rejections

Predictor Variables	Total Memory		Hits		Misses		False Positives		Correct Rejections	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Block 1		.06**		.10**		.10**		.04**		.04**
Condition	-.16**		-.31**		.31**		-.03		.04	
Collectivism	-.20		-.07		.08		.19**		-.19**	
Block 2		.02*		.02*		.02*		.00		.00
Condition	-.16**		-.31**		.31**		-.03		.04	
Collectivism	-.09		.03		-.03		.13*		-.13*	
Condition X Collectivism	-.18**		-.16**		.18**		.10		-.10	
Block 3		.06**		.03**		.03**		.03**		.03**
Condition	-.17**		-.31**		.31**		-.02		.04	
Collectivism	-.09		.02		-.02		.14*		-.14*	
Condition X Collectivism	-.16**		-.15**		.16**		.08		-.08	
Negative Emotions	-.24**		-.17**		.17**		.16**		-.17**	

Table 2. Hierarchical Regression Analyses of Collectivism and Sermon Condition on Memory. Note. * $p < .05$, ** $p < .01$

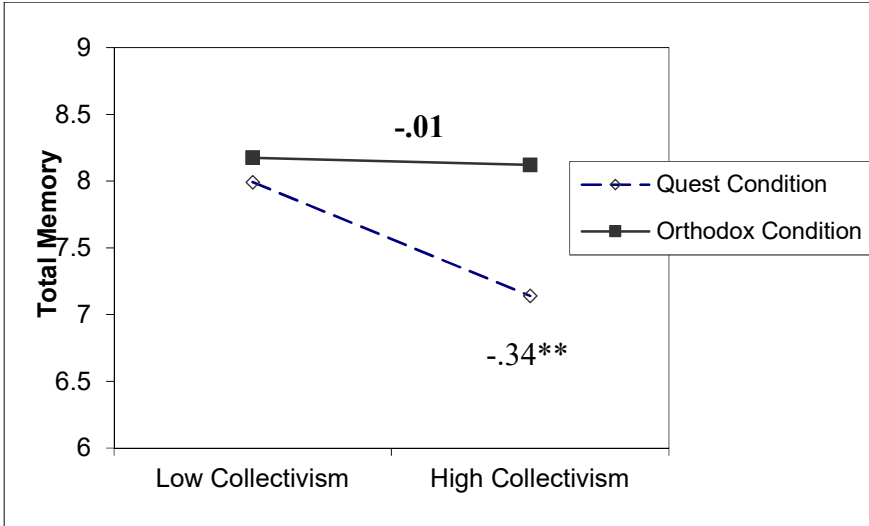


Figure 3. Simple Slopes of Collectivism X Condition Predicting Total Memory

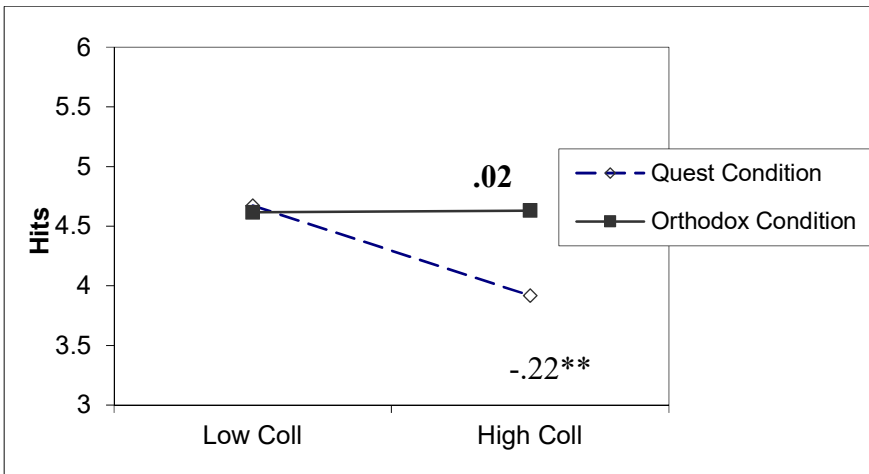


Figure 4. Simple Slopes of Collectivism X Condition Predicting Hits

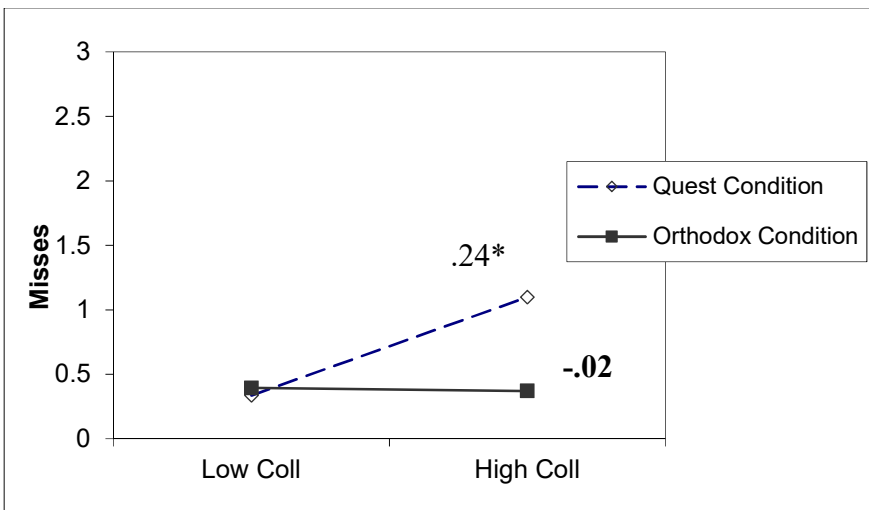


Figure 5. Simple Slopes of Collectivism X Condition Predicting Misses

Discussion

This experiment demonstrates that memory for religious stimuli is affected by the culture-fit of that information. By examining each type of memory outcome, we also gained some insights into how culture-fit memory functions in religious contexts. While reading the orthodox sermon, participants who were highly individualistic were able to accurately note that the information related to open interpretation was not spoken in the sermon. This suggests that people with highly individualistic values are adept at noting when their values are absent in collectivistic settings, which could serve as a protective mechanism from entering social groups with values toward conformity and obedience.

The effects were even more pronounced for the highly collectivistic individuals. More specifically, people with highly collectivistic values had extensive impairment in their memory when they read the quest-oriented sermon. On the memory test, they incorrectly noted that the orthodox statements were present and the quest statements were absent. It appeared as though they were reacting against the sermon by noting what they believed rather than what they read. Although this might suggest they simply ignored the instructions, there was no evidence of the same kind of bias for collectivistic individuals who read the orthodox sermon. This provides further support that Christians with an orthodox orientation also tend to embody collectivistic values (Terrizzi et al., 2013), that the culture-fit effects involving religious values are more pronounced for highly collectivistic individuals than for highly individualistic individuals (Gore, 2015), and that people who are highly committed to their religious ideology are more inclined than others to engage in a reactive confirmation bias when challenged (Yancey, 2014). We expanded on this work by being the first to show that cognitive inaccuracies depend upon the cultural values of the individual and the content of the religious stimuli, and that orthodox individuals exposed to quest stimuli are particularly likely to have poor memory for what they experienced.

We also showed that memory processes involving cultural and religious values are more accurate for schematic than for aschematic information. We found no evidence in our experiment that people are more able to recall aschematic information because it stands out against an already-existing schema (Koppel & Berntsen, 2014). Instead, highly collectivistic people exposed to aschematic stimuli were inclined to falsely report schematic content. This may suggest that the accuracy for schematic versus aschematic stimuli may depend on whether or not those stimuli have important values connected with them. Future research could provide further insight into this interaction effect. Other applications of this work should address some of the limitations.

Limitations and Future Directions

The primary limitation of this experiment was its ecological validity; we asked participants to read a sermon rather than listen to it. This is problematic due to the historic transmission of both religious and cultural values have been almost exclusively orally

communicated (Rubin, 2009). We did not have access to the audio recordings of the sermons we used, and even so, we wanted to have experimental control over other confounds that may be present in audio recordings, such as vocal inflection, regional accent, or quality of the recording. Nevertheless, future applications of this work should consider employing audio recordings of the sermons to provide a more common experience for the participants.

A second limitation of this study was that we only assessed individual-level cultural factors and did not examine societal-level ones. Cultural and religious values exist as shared meaning systems, which usually means that these values exist at a macro level in addition to within the individual. Other research has shown that culture-fit can be based upon societal level factors such as education and median income (Gore, 2015; Whitt, Jiang, & Gore, in press). Future applications of this work should therefore consider societal factors in addition to the individual ones.

We did not find consistent support for the culture-fit effect among highly individualistic individuals. This may be because many religious contexts tend to also include considerable emphasis on collectivism (Cukur et al., 2004). Consequently, the fit of a religious context may automatically be low for individualistic individuals. Future research should examine contexts that are more akin to individualism, such as supreme court decisions that center around the civil rights for marginalized groups, and manipulate the content of a court opinion to reflect either societal or personal benefits to those who are affected by the decision.

Conclusions

Several factors can influence whether stimuli will be encoded and retrieved accurately. One of those factors is the degree to which those stimuli fit into one's established beliefs and values. When exposed to religious content, people will often engage in processing that confirms their already existing beliefs (Yancey, 2014). For people who are strongly committed to their ingroups, exposure to content that challenges the authority of Biblical text seems to enhance the salience of their original beliefs rather than the recognition of the aschematic content. Thus, the degree to which a sermon will be remembered accurately largely depends on the degree to which that sermon fits with the audience's cultural values.

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Appendices

Orthodox Sermon Condition

The Word of God comes to us tonight from 2 Peter chapter 1. We're looking at verses 20 to 21 under the subject, "The Sure Word." In this, Peter says:

2 Peter 1:20-21

²⁰ Above all, you must understand that no prophecy of Scripture came about by the prophet's own interpretation of things. ²¹ For prophecy never had its origin in the human will, but prophets, though human, spoke from God as they were carried along by the Holy Spirit.

The Bible makes some startling claims for itself that set it apart from every other book in the world. Scripture says, for example, "The law of the Lord is perfect." It says, "Thy Word is very pure." It says, "Thy law is truth." It says, "All Thy commandments are truth." "The sum of Thy Word is truth." "Every one of Thy righteous ordinances endures forever." "All Thy commandments are righteous." "The law is holy, just and good." "Scripture cannot be broken." "Every word of God is pure and flawless." "Not one jot or tittle shall pass from the law until all is fulfilled." Scripture is even called the word of truthfulness.

Over and over again the Scripture reminds us that it is a sure word. That is precisely the message of our text. Let's go back to it, 2 Peter chapter 1 and verses 16 through 21, and let me read you these verses so you have them in your mind as we consider them. Beginning in verse 16, "For we did not follow cleverly devised tales when we made known to you the power of our Lord Jesus Christ but were eyewitnesses of His majesty. For when He received honor and glory from God the Father, such an utterance as this was made to Him by the majestic glory, 'This is My beloved Son with whom I am well pleased.' And we ourselves heard this utterance made from heaven when we were with Him on the holy mountain." And so we have the prophetic word, more sure, to which you do well to pay attention as to a lamp shining in a dark place until the day dawns and the morning star arises in your hearts. But know this, first of all, that no prophecy of Scripture is a matter of one's own interpretation for no prophecy was ever made by an act of human will but men moved by the Holy Spirit spoke from God.

Peter might be expecting someone to say, "Well, Peter, I'm glad you had your experience, but your experience can't be the standard for truth. Lots of people have lots of experiences, real and unreal. So, Peter, as good as your firsthand experience is, as wonderful as it must have been to have walked and talked with Jesus, seen Him on the cross, seen Him after His resurrection, as great as it was to have seen His Second Coming glory glimpsed on the mount of transfiguration, there must be a more sure word than your experience. As true as it was, as valid as it was, there must be more than that."

Peter is concerned with the source of Scripture. Prophets didn't invent it. They didn't invent the Word. Not at all. The same God who spoke at the transfiguration about the deity and humanity of Christ, the same God who spoke of the perfection of His Son is the same God who authored Scripture. You do well, he says, to give heed to this holy Scripture like a night light in the midst of worldly darkness because what is in it is not the result of human inventions like the myths of false teachers. The NIV, I think, has an excellent translation, it says, "No prophecy of Scripture ever came about by a prophet's own ideas." He couldn't be talking about interpretation or verse 21 would make no sense. Verse 21 says, "For no prophecy was ever made by an act of human will, but men moved by the Holy Spirit spoke from God." That explains what he means in verse 20. Quite the contrary to Scripture being of human origin, it is of divine origin...for NO prophecy, NO word of Scripture, NO word from God, not any was ever absolutely never...notice how emphatic this is...no prophecy was ever at any time made by an act of human will. The Bible is not the product of men.

So, back to 2 Peter, what is Peter saying? No prophecy ever came by some act of human will. Just the opposite...just the opposite, alla, quite the contrary, that's the word for "but," but on the other hand, men moved by the Holy Spirit spoke from God.

The Holy Spirit then is the divine author, the producer of the prophetic word, not human thought, not human will, this is not a book written by men. This is a book recorded by men, but authored by God the Holy Spirit. The only one who knows the mind of God is the Spirit of God, so the only one who could move the writers along is the Spirit of God. The Holy Spirit inspired the writers, moved them along and they wrote the Word of God. They were living men. They weren't lifeless pens. They were not passive, they were active. But the Holy Spirit through them wrote God's flawless, inerrant Word. And that's why we have a more sure word. That's why it is a lamp in a dark place.

You say, "How did they do it?" I don't know. I don't know the supernatural phenomena. I don't know what they felt. I don't know what they experienced. I don't know what kind of phenomena was going on. All I know is that the Spirit of God wrote it and as a result we have a more sure word.

So, Peter says...Look, I'm not a false prophet, I'm not like the false prophets. First of all, I was an eyewitness of the majesty of Jesus Christ so I know whereof I speak. But even more sure than that, I write as one moved along by the Holy Spirit like every other biblical

writer and so here is a more sure word of revelation, more sure even than the experience of an Apostle. So Peter says take heed to the Word, it's a more sure word.

He reiterates this same concern in chapter 3 as he says in verses 1 and 2, "This is now, beloved, the second letter I'm writing to you in which I'm stirring up your sincere mind by way of remembrance." Then he says this, verse 2, "That you should remember the words spoken beforehand by the holy prophets and the commandment of the Lord and Savior spoken by your Apostles." You've got to look to the Word, that's the sure word.

So, God superintended human authors so that using their own individual personalities, experiences, thought processes and vocabulary, they composed and recorded without error His perfect revelation in the original copies of Scripture. And so we have a light, a night light in a dark place. And it's going to be our night light until the Morning Star arises. And immediately following the Morning Star, the day dawns in the day of glory in the Kingdom of Christ and He becomes not just the Morning Star but the blazing sun who becomes the lamp of the eternal dwelling place of God's people. But until that blazing light dissipates all darkness, we have to have the night light and it's a more sure word. If you're going to stand against error, you should know your Scripture.

Quest Sermon Condition

Have you ever had a discussion about some Biblical passage or topic in which the person with whom you were speaking abruptly ended the conversation with the words "That's just your interpretation"? Or maybe they said "Well, that's just your opinion" or "You've got your opinion on that, and I've got mine." If you have talked to others about the Bible much at all, odds are good you have had such things said to you, perhaps often. The pluralistic religious landscape in our country is quite full of this concept.

Have you ever used 2 Peter 1:20 as a reply to that? Peter said:

2 Peter 1:20-21

²⁰ Above all, you must understand that no prophecy of Scripture came about by the prophet's own interpretation of things. ²¹ For prophecy never had its origin in the human will, but prophets, though human, spoke from God as they were carried along by the Holy Spirit.

Some people think this statement by Peter is the perfect retort to "that's just your interpretation." On the surface it appears that Peter is saying that there is no such thing as "your interpretation" or "my interpretation" of the Bible, there's just what the Bible says and that's that. No one, the passage says, is allowed the comfort of a private, personal interpretation of the Bible. The Bible is not to be read in such a way that it is made to conform to our opinions and assumptions; instead, we must conform to what it says. But is that really what 2 Peter 1:20 is saying? Let's take a closer look at this whole business.

Let's begin with the more general matter of different interpretations. To some people, "interpretation" is actually a bad word because it has unnecessarily become associated with subjectivism and the pluralistic mentality which asserts that the Bible is basically unintelligible, that opinions (interpretations) are all we can hope to have when it comes to the Bible and religious matters, and that since the Bible is unintelligible in the first place, all opinions (interpretations) about what the Bible means are equally valid. Some interpretations of the Bible may have such an attitude behind them, but the fact is that we cannot escape the business of interpreting the Bible. Even those who claim that all they do is let the Bible speak for themselves engage in an interpretive process (although they are probably unaware of it themselves).

Is the Bible basically unintelligible? Not at all. The Bible is eminently understandable. It makes this very claim for itself (Eph 3:4). But the question everyone who picks up a Bible eventually faces (whether they address it explicitly or not) is: what does this mean? The moment we begin to inquire about the meaning of any part of the Bible, or even of the Bible as a whole, we have asked the first question in the process of interpretation. And when we begin to say "I think the Bible means this" or "I think this passage is saying that," we have produced an interpretation, like it or not.

Engaging in the process of interpretation is not an evil thing. I will reassert that everyone who picks up a Bible and wonders to any degree what the text means is already involved in an interpretive process. Anyone who has any opinion about what the Bible teaches has arrived at an interpretation of the Bible. The real question is: is this the right interpretation? Is my interpretation correct? Is the interpretation at which I have arrived the one that makes the very best sense of what is written? Does the interpretation I have produced fit the Biblical data without distorting it in any way (that is, without twisting words, without leaving data out, without reading foreign ideas into it, etc.)?

Consider, if you will, that the interpretation of the Hebrew Scriptures was one of the key issues upon which Christianity was founded. The early Christians, who had learned from Jesus himself, believed and taught that the Hebrew Scriptures spoke of the demise of the Levitical sacrificial system centered in the tabernacle and temple, that those Scriptures predicted the coming of Jesus of Nazareth into the world, that they predicted his death, burial and resurrection, and that they spoke of the resurrected Jesus as the king over God's

kingdom. Many of the Jews disagreed with that vehemently. That is, one of the greatest differences between Judaism and Christianity was their interpretation of the Hebrew Scriptures. Christianity is itself an interpretation of those Scriptures, and it claims to be the right interpretation.

Interpretation is unavoidable when handling the Bible, and the early Christians themselves were interpreters (whose interpretation was viewed as radical by the Jews) of the Jewish Scriptures. Peter was not, therefore, condemning interpretation wholesale in 2 Peter 1:20. Read Peter's letters and what you will see there is an interpretation of the life of Christ. Because Peter was an apostle guided by the Holy Spirit, we can be assured that his interpretation of the story of Jesus was correct. But it was an interpretation nonetheless.

So what does 2 Peter 1:20 mean (note that this is itself an interpretive question!)? Consider the context. Peter is there talking about the prophets of Old Testament times. This is clear from verse 19, in which Peter says "we have the prophetic word made more sure." What Peter means is that Jesus was the fulfillment of Old Testament prophecies, and Peter himself was an eyewitness to this very fact. It was not that Peter had heard that Jesus fulfilled prophecies, but that Peter knew it from his own experience with Jesus.

How were the prophets of old able to predict with such astonishing clarity and accuracy the things about Jesus? Peter tells us plainly in verse 21: "no prophecy was ever made by an act of human will, but men moved by the Holy Spirit spoke from God." The Spirit of God revealed these things to them. They were not making guesses about the Messiah. In fact, they were not even making educated guesses. What they predicted was not a matter of them arriving at some interpretation of events they saw in their own day. This is what Peter means when he says "no prophecy of Scripture is a matter of one's own interpretation."

For example, the prophet Isaiah predicted the Babylonian captivity of Judah at a time when Babylon was not a military or political threat to anyone, nor was there any indication they would be some time later. In Isaiah's time the Assyrians were waging wars of conquest over all of the Ancient Near East. If Isaiah had been guessing, or interpreting, what would happen to Judah based on the things that were going on around him, he would have predicted that the Assyrians would take the kingdom of Judah into captivity. But he did not. He accurately predicted that the Babylonians would do that, and that is exactly how it unfolded in history. This is because Isaiah was not interpreting the events of his day, looking for patterns in current events, as he spoke about the future of Judah. What he said about Judah he said from the Holy Spirit of God.

2 Peter 1:20, then, is about the prophets and how they made their predictions. It is not about the more general issue of interpreting the Bible. 2 Peter 1:20 is not about whether anyone must or can interpret the Bible. So the next time someone says "that's just your interpretation," instead of quoting 2 Peter 1:20 to them, invite them to investigate which interpretation (understanding, or reading) of the Bible is the right one.

Decisions Are More than Skin Deep: Exploring Correlations between Self-Esteem and the Decision to Have Bariatric Surgery

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Abstract: *Bariatric surgery is now a commonplace approach to addressing obesity. One insightful area of research is examining how bariatric decision relates to self-esteem. Of particular interest is correlations between self-esteem levels and the reason the surgery was selected, the source of the decision to get the surgery, and if the surgery recipient experienced a major life change following the event. In this study, the researchers examine a convenience sample of persons receiving bariatric surgery (n=31) and their motivations for having the surgery along with a pre-post measure of having the surgery. Results show respondents who indicated having the surgery was their idea had higher self-esteem prior to surgery while respondents who had the surgery to address their physical appearance or lose weight reported lower self-esteem prior to the surgery. In contrast, respondents who indicated they had the surgery to prevent a medical problem reported slightly higher self-esteem post-surgery.*

Keywords: self-esteem; bariatric surgery

Obesity and its related medical issues are increasingly being addressed through surgical procedures such as bariatric surgery (ASMBS, 2016). Bariatric surgery (which includes gastric bypass, gastric sleeve, gastric bands, and duodenal switches) impact obesity through restricting the volume and nutrient intake of food as well as insulin sensitivity while also addressing behavioral changes (Lim, 2016; ASMBS, 2016). Although the surgical approach offers risks, it also offers desirable outcomes to those able to adhere to the post-surgery guidelines (NIDDK, 2015). One overlooked element of the exhaustive research on bariatric surgery is an exploration of how characteristics like self-esteem can shape the decision to actually obtain the surgery, and how the decision to have the surgery might also shape one's self-esteem in turn. Although studies have linked constructs such as obesity and self-esteem (see Baudson, Weber, & Freund, 2016), there is room for new research examining how self-esteem relates to bariatric surgery. Specifically, it is interesting and useful to understand how different reasons for getting the surgery might reflect changes in self-esteem. Similarly, it is valuable to examine how these changes are understood both pre- and post-surgery. In this study, the authors explore how self-esteem correlates with multiple reasons for getting bariatric surgery. Using an online survey of persons who have received bariatric surgery, respondents shared their self-esteem both pre- and post-bariatric surgery, as well as some of their motivations for having the surgery. Results indicated three significant differences in self-esteem (two pre-surgery, one post-surgery).

Obesity is a medical condition that can now be surgically treated (Farrell, Haggerty, Overby, Kohn, Richardson, Fanelli,

2009; NIDDK, 2015; Lim, 2016; ASMBS, 2016). Currently one-third of the US population is estimated to be obese (Farrell, et al., 2009). The definition of obesity is to have a body mass index (BMI) of 30 or greater (NIDDK, 2015). Evidence suggests that for the morbidly obese to achieve substantial and sustainable weight loss, surgical operations are the best treatment options (Farrell, et al., 2009). Bariatric surgery is only an option for the severely obese who have tried other ways to lose weight without success and those suffering with health problems related to their weight (NIDDK, 2015).

Furthermore, there is an increased risk of medical conditions and emotional issues associated with obesity, which makes it a priority for physicians to assess and treat (Aronne, 2012). Sleep apnea and type 2 diabetes are among the possible complications caused by obesity (Aronne, 2012). High blood pressure, unhealthy cholesterol levels, urinary incontinence, body pain, and knee and hip pain are also among the risk factors associated with obesity (NIDDK, 2015). Studies show that both the gastric sleeve and the gastric bypass are effective for improvement and remission of diabetes (ASMBS, 2016). Studies also show a reduced risk of cardiovascular-, stroke-, and cancer-caused mortality among bariatric surgery patients (Adams, Mehta, Davidson, & Hunt, 2015). Indeed, obesity is a significant cause of mortality (Christou, Sampalis, Liberman, Look, Auger, McLean, & MacLean, 2004), which is why treatments such as bariatric surgery are so important. Evidence shows that bariatric surgery improves survival among severely obese patients (Arterburn, Olsen, Smith, Livingston, Scoyoc, Yancy, Eid, Weidenbacher, & Maciejewski, 2015).

Bariatric operations include volume-restrictive and nutrient-malabsorptive procedures that effect satiety, absorption, and insulin sensitivity in combination with behavior changes to reach and sustain weight loss (Lim, 2016). To be more specific, bariatric surgery is an operation that helps a person lose weight either by reducing the size of the stomach so the person eats and drinks less, or by changing the small intestine so that it absorbs less calories and nutrients from what the patient consumes (NIDDK, 2015).

There are four types of bariatric surgeries used in the United States: gastric bypass, gastric sleeve, gastric band, and duodenal switch (NIDDK, 2015). The most common procedures are the gastric bypass and gastric sleeve, so this research will focus on those two. The gastric bypass is also referred to as the Roux-en-Y (ASMBS, 2016). The procedure first creates a one-ounce pouch in the top of the stomach, then divides the small intestines and connects the lower portion of those intestines to the created stomach pouch. Then, surgeons finish by connecting the top part of the intestines further down on the small intestine so the stomach acids and digestive enzymes bypass the stomach but still mix with the food while in the small intestines (ASMBS, 2016). The gastric bypass procedure is highly effective as a result of the creation of a smaller stomach, which causes the person to consume fewer calories. Additionally, the rerouting of the food changes the gut hormones, causing satiety and suppressing hunger (ASMBS, 2016). The laparoscopic sleeve gastrectomy is also referred to as the sleeve (ASMBS, 2016). This procedure is performed by removing approximately 80 percent of the stomach and leaving a tubular stomach that is similar in size and shape to a banana (ASMBS, 2016). The sleeve procedure is also highly effective and operates by creating a smaller stomach, which causes the person to consume less food. Similarly, the gut hormones react in such a way that it also impacts hunger, satiety, and blood sugar control (ASMBS, 2016).

Additionally, prior research has examined bariatric patients' demographic patterns (DeMaria, Pate, Warthen, Winegar, 2010). DeMaria et al. (2010) utilized a sample of 57,918 patients, 41,243 of which were between the ages of 26 and 55. Less than one percent were under the age of 18 (.14%) and almost six percent (5.67%) were over the age of 66. A majority (78.76%) of the patients were females, while another important demographic majority was White patients (78.12%). In all, 10.52% registered as African-American, 6.02% as Hispanic, .46% as Native American, and .20% as Asian. Of those patients, the majority chose to have the gastric bypass procedure (54.68%) more than any other any other bariatric procedure (DeMaria, et al, 2010).

Although the surgery is extremely beneficial, it is not a guarantee fix, and has some possible complications or disadvantages. The gastric sleeve has the advantage of requiring no re-routing of the food stream compared to the gastric bypass, and requires only a short hospital stay of two days or less (ASMBS, 2016). A major disadvantage of the sleeve, however, is that it is a non-reversible procedure and has the potential for long-term vitamin deficiencies (ASMBS, 2016). In regards to gastric bypass, because of its high complexity, it has high

complication rates (ASMBS, 2016). Other disadvantages of gastric bypass are an increased risk of long-term vitamin/mineral deficiencies, usually requires a longer hospital stay than gastric sleeve patients (ASMBS, 2016), and, due to the way the bypass creates a difference in which the body breaks down and absorbs alcohol differently, possible alcohol-related issues (NIDDK, 2015). Additionally, the vitamin deficiencies and potential lack of nutrients can lead to health problems like anemia or osteoporosis (NIDDK, 2015). Gallstones can occur after rapid weight loss so that is a potential side effect from all bariatric surgeries (NIDDK, 2015). Other problems that could occur after bariatric procedures include strictures (narrowing of the new stomach or at the connection between the stomach and small intestine) which can cause nausea, vomiting, trouble swallowing, and hernias (which is repaired with another surgery) (NIDDK, 2015). Another important consideration is that these surgeries do not ensure 100% excessive weight loss. Specifically, the gastric bypass produces a long-term weight loss of 60 to 80 percent of a patient's excess weight, with the gastric sleeve having comparable weight loss percentages (ASMBS, 2016).

Other potential side effects from bariatric surgeries are bleeding, infection, leaking from the site where the sections of the stomach or small intestine were sewn together, diarrhea, blood clots, and death (NIDDK, 2015). Specifically, in a study of 57,918 patients, 78 of those patients died due to complications of the surgeries which put the mortality rate at .13% (DeMaria, et al, 2010). Birkmeyer et al. (2010) found that, in a sample of 15,275 bariatric patients, 7.3% experienced perioperative complications, most of which were minor-like wound problems. Prior literature also indicates that patients are at an increased risk for externally caused death such as suicide (Adams, et al., 2015). Indeed, there are risks involved in all surgeries, and it is critical that potential bariatric patients consider them, however, the studies show that these surgeries are saving lives at a tremendously higher percentage than the percentage of patients dying from the surgeries.

Research suggests that a person's self-esteem is linked to their physical appearance (CITE!). Indeed, the results of Frederick et al. (2016) showed that people with a higher BMI were less satisfied with themselves. The study examined the appearance and weight satisfaction among 12,176 adult men and women. Fifteen percent of the men and 20 percent of the women were "very-extremely dissatisfied" with their weights. Results indicated that weight and appearance satisfaction were associated with overall life satisfaction. In a similar study by Baudson et al. (2016) which focused on adolescents, results showed that good looks is an attribute associated with the perfect human. The idea of a perfect person is unattainable and leads people to feel inadequate. Charles Horton Cooley's (1902) "looking-glass self" concept was the assumption that one's self-perception mirrored how others perceived them. These notions are reflected in the structure of self-concept, which can be defined as the beliefs and attitudes people have about themselves, and beliefs one has about their own appearance is one main dimension of self-concept. The term self-concept has often been used interchangeably with the term *self-esteem*,

therefore, one can say that someone’s opinion of their own appearance is a main dimension of their self-esteem, they are linked, and they feel that their opinion about themselves is also the opinion of others.

Although the majority of research focuses on the physical health that improves due to weight loss surgery, an aspect that seems to be overlooked is the *emotional impact* the surgery has on patients. The medical conditions that improve after bariatric surgery are numerous and that alone is reason for medical professionals to recommend the procedures to any morbidly obese patient. Treatment should not stop on the physical front, nevertheless, emotional health should be considered during the preop and postop stages. Indeed, an increased risk of externally-caused deaths, including suicide, after bariatric surgery is a valid reason for concern (Adams, et al., 2015). One must continue to monitor the patient even after surgery to better understand why the surgeries do not always succeed with maximum weight loss and externally-caused deaths rise. Surgeons should recommend that their patients seek help from mental care professionals, even just for routine checkups, to stay on top of their mental health during a time of drastic change in their lives.

Based on the literature review on this topic, the researchers established five hypotheses using difference of means testing to explore relationships between one’s rationale for having the procedure and one’s self-esteem.

H1A. Post-surgery self-esteem means will be higher for persons choosing bariatric surgery due to reasons attached to appearance.

H1B. Pre-surgery self-esteem means will lower for persons choosing bariatric surgery due to reasons attached to appearance.

H2A. Post-surgery self-esteem means will be higher for persons stating it was their choice to have the surgery.

H2B. Pre-surgery self-esteem means will be lower for persons stating it was their choice to have the surgery.

H3. Self-esteem means will be higher for persons stating they experienced a major life change post-surgery.

Method

Participants

Based on existing literature, the researchers examined how self-esteem and the decision to have bariatric surgery might be correlated with changes in self-esteem. The authors collected survey responses from a Facebook support group of persons (N = 125) who have had bariatric surgery. The online survey was released to the group on three occasions across a one-month period. In all, 31 persons responded to the survey. As not all persons who have had bariatric surgery have an opportunity to complete this survey, the sample is best treated as a convenience sample. As such, caution should also be used in applying any findings in the study to all persons who have had bariatric surgery.

Measures

This study utilized the Rosenberg Self-Esteem Scale, a ten-item and seven-point Likert item with four reverse coded items (with possible scores ranging between 1 and 7). The scale is posed to the respondent twice. Upon first assessment, they are asked to describe their self-esteem at the present time. Later, they are asked to think back in time to when they were considering having the surgery. Although the authors acknowledge it is imperfect, this gives the authors the best possible opportunity to analyze how other variables related to the surgery might have impacted self-esteem. Table 1 lists the item means for the scale examining self-esteem prior to the surgery ($\alpha = .866$). Table 2 lists the item means for the self-esteem measure post-surgery ($\alpha = .935$).

Item	n	Min	Max	Mean	SD
On the whole I am satisfied with myself.	30	1	7	4.67	2.00
At times, I think I am no good at all. (reverse coding)	30	1	7	4.50	1.99
I have a number of good qualities.	28	1	7	3.32	1.61
I am able to do things as well as most people.	28	1	7	4.18	1.96
I feel I do not have much to be proud of. (reverse coding)	28	1	7	3.86	1.97
I certainly feel useless at times. (reverse coding)	28	1	7	4.61	1.87
I feel that I'm a person of worth at least on an equal plane with others.	28	1	7	3.50	1.81
I wish I could have more respect for myself (reverse coding)	28	1	7	2.75	1.81
All in all, I am inclined to feel that I am a failure. (reverse coding).	28	1	7	4.14	2.10
I take positive attitude toward myself.	28	2	7	4.39	1.83

Table 1. Descriptive Statistics for Self-esteem Scale (Before Surgery) ($\alpha=.866$)

Item	n	Min	Max	Mean	SD
On the whole I am satisfied with myself.	31	2	7	5.58	1.34
At times, I think I am no good at all. (reverse coding)	31	1	7	5.03	1.92
I have a number of good qualities.	31	3	7	5.87	1.15
I am able to do things as well as most people.	31	2	7	5.71	1.40
I feel I do not have much to be proud of. (reverse coding)	31	2	7	5.77	1.33
I certainly feel useless at times. (reverse coding)	31	1	7	4.97	1.82
I feel that I'm a person of worth at least on an equal plane with others.	31	3	7	5.81	1.25
I wish I could have more respect for myself (reverse coding)	31	1	7	3.74	1.77
All in all, I am inclined to feel that I am a failure. (reverse coding).	31	1	7	5.74	1.57
I take positive attitude toward myself.	31	2	7	5.35	1.54

Table 2. Descriptive Statistics for Self-esteem Scale (Post Surgery) ($\alpha = .935$)

Next, the authors generated several variables that, based on literature, could explain why the respondent elected to have bariatric surgery and the manner in which those variables could influence self-esteem. First, respondents were asked their primary reason for having the surgery. Options offered included having the surgery to prevent a medical problem, to fix an existing medical problem, to change their physical appearance, to lose weight, and to find a solution to yo-yo dieting. Respondents could check any option that they felt applied to their experiences. Respondents were also offered a write-in category, but as only one respondent used it, it was not included in the analysis. For each category, a dichotomous dummy coding variable was created where 1 equaled the respondent being in that category and 0 equaled being outside that category. For example, if the respondent noted that they had the surgery to fix an existing medical problem they would be coded as a 1 in the new variable. Due to low n and respondents noting similarities in the wording of the two questions, the authors elected to combine persons who had the surgery to change their physical appearance and those who had the surgery to lose weight into a single category.

A measure asking if the respondent experienced a major life change following the surgery was also included. However, no analysis will be done on this variable in the self-esteem before surgery scale as the life change due to the order in which the variables would have happened. This was included as the authors expected this life event could also correlate with changes in self-esteem.

Finally, the authors generated measures on how the respondent first learned of their surgery. The authors analyzed one category (“I knew someone who had the surgery.”) to examine how others could influence the decision to have the

surgery. Similarly, the authors included a measure regarding if the respondent was the person who actively decided to have the surgery (“It was my idea to have the surgery.”) or if it was someone else’s idea, which helped account for social versus personal reasons for having surgery.

Procedure

The authors examined how decisions for having the surgery impacted self-esteem using a difference of means test. First, the authors examined this relationship prior to going through the surgery, then after the respondent has completed the surgery. In all cases, the authors included p -values for one-tailed and two-tailed results. The one-tailed results examined if the difference between groups was less than zero or higher than zero, while the two-tailed examines if the difference was not equal to zero. Including these provided more clarity in the results in this exploratory study.

Results

Table 3 presents the mean, standard deviation, and min/max for all variables in this study. The two self-esteem scales are continuous scale measures formed via the Likert matrix and is described in the methods report. The remaining variables are dichotomous dummy coding and their means can be interpreted as percentages of cases indicating they are in that category. Overall, the sample self-esteem scale (before surgery) scores had a mean of only 3.73 with a minimum score of 1.00 and a maximum score of 6.50. In comparison, the sample self-esteem scale (after surgery) scores averaged 5.35, with a minimum of 2.20 and a maximum of seven, the highest possible score. Note that there were three participants who failed to complete the self-esteem scale (before surgery), which created slight n differences in the analysis noted later in this section.

	n	Mean	SD	Min	Max
Self-esteem Scale (Before Surgery)	28	3.73	1.51	1.00	6.50
Self-esteem Scale (After Surgery)	31	5.35	1.21	2.20	7.00
Prevent medical Problem	32	.28	.45	.00	1.00
Fix existing medical problem	32	.25	.43	.00	1.00
Change physical appearance or lose weight	32	.31	.47	.00	1.00
To find a solution to yo-yo dieting	32	.12	.33	.00	1.00
Experienced major life change	30	.40	.49	.00	1.00
I knew someone who had the surgery.	32	.78	.42	.00	1.00
It was my idea to have the surgery.	32	.78	.42	.00	1.00

Table 3. Descriptive Statistics of Variables in Analysis.

Recall that the dichotomous dummy coded categories examine the main reason for having the surgery, if the respondent experienced a major life change following the surgery, how the respondent first heard about the surgery, and whose decision it was to have the surgery. Regarding participants' main reasons for having the surgery, 28% of surgery recipients did so to prevent a medical problem, while 25% elected to have surgery to fix an existing medical issue. Almost a third of respondents indicated that changing their physical appearance or losing weight was the main reason for having the surgery. Only 12% felt that finding a solution to yo-yo dieting was the main reason for having the surgery. In all,

40% of respondents indicated they experienced major life changes after their surgery.¹ A notable 78% indicated they knew someone who had the surgery prior to selecting the surgery. Similarly, 78% also indicated it was primarily their idea to have the surgery. As these two variables had the same mean and standard deviation, it should be noted that these findings are not typos. Likewise, respondents' answers from the first variable were not always the same in the second variable.

Table 4 presents the difference of means testing, which examined reasons for getting the surgery, if the respondent experienced a major life change following the surgery, how the respondent first heard about the surgery, and whose idea was it

¹ Although not examined in this paper, the survey included a question asking the respondent to state in their own words the nature of their major life change. The authors categorized their answers into the following groups: education change (3), employment change (2), martial/relationship change (2),

physical activity change (2), and medical problem change (1). Future research should examine this important aspect of the decision to undergo surgery, leading the authors to include this research note.

to get the surgery, and the differences in self-esteem before and after the surgery. The table lists p-values examining both ends of the t-test for reference purposes and includes two significant results. First, respondents who indicated that they had the surgery to change their physical appearance or lose weight had lower mean self-esteem prior to the surgery (2.60) than those who did not (3.92). Second, respondents who indicated that it was their idea to have the surgery had statistically higher self-esteem (4.01) than those who did not indicate this was a reason

for having the surgery (2.71). These findings give evidence to support hypotheses 1B and 2B.

Table 5 examines self-esteem post-surgery in which only one finding was statistically significant. Respondents who indicated that they had the surgery to prevent a medical problem had statistically higher self-esteem (5.97 vs 5.10). Based on these findings, this evidence does not support either hypotheses 1A, 2A, or 3.

	Category (cases)	Mean (SD)	(p: Difference <0)	p: Difference not equal to zero	(p: Difference >0)	t-test Result (df)
Prevent medical Problem	0=20	3.54 (.36)	.13	.27	.86	-1.10 (26)
	1=8	4.23 (.41)				
Fix existing medical problem	0=22	3.56 (.30)	.12	.24	.87	-1.18 (26)
	1=6	4.38 (.69)				
Change physical appearance or lose weight	0=24	3.92 (.28)	.94	.10	.05	1.68 (26)
	1=4	2.60 (.96)				
To find a solution to yo-yo dieting	0=24	3.76 (.32)	.59	.81	.40	.23 (26)
	1=4	3.57 (.45)				
Experienced major life change post-surgery	-	-	-	-	-	-
	-	-				
I knew someone who had the surgery.	0=5	4.16 (.61)	.74	.50	.25	.67 (26)
	1=23	3.64 (.32)				
It was my idea to have the surgery.	0=6	2.71 (.67)	.03	.06	.96	-1.96 (26)
	1=22	4.01 (.29)				

Table 4. Difference of Means Testing for Self-esteem Measures and Reasons for Undergoing Bariatric Surgery, Pre-surgery

	Category (cases)	Mean (SD)	(p: Difference <0)	p: Difference not equal to zero	(p: Difference >0)	t-test Result (df)
Prevent medical Problem	0=22	5.10 (.26)	.03	.06	.96	-1.89 (29)
	1=9	5.97 (.28)				
Fix existing medical problem	0=24	5.39 (.25)	.62	.75	.37	.31 (29)
	1=7	5.22 (.40)				
Change physical appearance or lose weight	0=26	5.43 (.21)	.79	.40	.20	.83 (29)
	1=5	4.94 (.77)				
To find a solution to yo-yo dieting	0=27	5.35 (.24)	.48	.97	.51	-.02 (29)
	1=4	5.37 (.32)				
Experienced major life change	0=18	5.21 (.32)	.20	.41	.79	-.82 (27)
	1=11	5.60 (.29)				
I knew someone who had the surgery.	0=6	5.95 (.25)	.90	.18	.09	1.34 (29)
	1=25	5.21 (.25)				
It was my idea to have the surgery.	0=6	5.13 (.75)	.31	.62	.68	-.04 (29)
	1=25	5.41 (.21)				

Table 5. Difference of Means Testing for Self-esteem Measures and Reasons for Undergoing Bariatric Surgery, Post-surgery

Discussion

The analysis in this study offers new exploratory knowledge of the complex relationship between self-esteem and bariatric surgery, as well as a number of new outlets for future research. First, the difference of means tests indicated that there is a relationship present between reasons for getting bariatric surgery and self-esteem both before and after the surgery. The explanations for this finding, however, are still convoluted and deserve more research. For example, when looking at persons who chose the surgery to change their physical appearance or to lose weight, what remains unclear is exactly how physical appearance manifests into self-esteem. A potential explanation here could be socialized expectations about appearance. The person considering the surgery has, across their life course, experienced ideas about what a normal person looks like, which might influence their decisions. Similarly, the person may be seeking to match some kind of preconceived idea of beauty or wellness. More work should be done to explore surgery recipients' motivations, including what other forces (such as social/family networks or even mediated images and preconceptions of beauty) may shape that decision.

Future research should explore how one's self-appearance manifests into the decision to get surgery (or vice versa: how the decision to get the surgery shapes one's self-image).

Second, the study offers one case in which self-esteem changes post-surgery as a result of decision-making. Specifically, persons who chose to have the surgery for medical reasons correlated with higher self-esteem. Persons who indicated that getting the surgery to address medical problems on average had the highest means of any post-surgery category (5.97 of 7). This is a very interesting finding, but it also leads to more questions. For example, how exactly does the relationship between the two variables occur? Arguably it could have little to do with the surgery. It is reasonable that addressing any major life issue (such as a medical problem) could manifest as improved self-esteem. Even the process of overcoming a life barrier or meeting a life goal could correlate with the improved self-esteem. As such, further research should examine the nuance of how this change might function.

Third, mean self-esteem, regardless of reasons for choosing the surgery or influences on having the surgery, does show a slight change pre and post-surgery. Recall in Table 3

that the pre-surgery mean self-esteem was 3.73, while the post-surgery mean was 5.35. The max score would be a 7 in this scale. This offers an interesting finding that the surgery is having some kind of impact on the recipient. Exactly how that change is experienced, however, is unclear and deserves more research. For example, is the change a manifestation of feeling a different level of health, socialized understandings of beauty, or perhaps some other force altogether? This topic requires deeper analysis.

Fourth, the analysis also provides support for new research that looks in more detail at social networks' and relationships' impact on the decision to get bariatric surgery and how these might matter. For example, there were no statistical differences in means for persons who indicated they knew someone else who had the surgery (which was the bulk of the sample). However, persons who did not chose the surgery for themselves reported very low self-esteem (2.71 of 7). Is this lower self-esteem due to the participants taking others' perspectives into account, or perhaps allowing others to impact the decision-making process? It would be interesting to understand how social networks might impact an individual's self-esteem and conceptions of their appearance, while also examining this among the decision-making process for getting surgery.

This study includes several omissions that should be addressed in future research. First and foremost, the findings are difficult to extrapolate to all persons who have had bariatric surgery. There are also additional variables, such as changes in our society, which are not accounted for in this snapshot of a small group of bariatric surgery recipients. One further issue with the sample is that participants were engaged in a support group, which could also shape the data in unpredictable ways.

Next, the measurement of self-esteem prior to the surgery, while interesting, is also problematic. Although in spirit a respondent could go back to that moment and reflect on their self-esteem, it is still something that can be shaped by events that have happened since that moment. Ideally, this kind of data should be collected from future surgery recipients prior to their surgery, making a more ideal analysis of this relationship.

This exploratory study also offers directions for future research in relation to its findings. One example is an in-depth examination of the two-way relationship between self-esteem and bariatric surgery. Thorough analysis using larger samples could help establish how these variables influence each other

and provide new information about the direction of the research. As mentioned in several cases in the discussion, the study also warrants further research into clarifying the relationships between self-esteem and bariatric surgery. There is need of more thorough explanations regarding the nuances of how these changes in self-esteem might be experienced in relation to changes post-surgery, but also how overcoming life issues (such as a medical problem) might equally be relevant to the change in self-esteem.

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Different Hollers, Different Outcomes: Differences in Health Outcomes among Appalachian and Non-Appalachian Counties in Kentucky

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Abstract: *This study examines difference in health outcomes, health insurance, and doctor access between Kentucky's Appalachian and non-Appalachian counties. Using 2018 data curated by the Robert Wood Johnson Foundation, this study analyzes differences in means in overall health outcomes, health insurance, and the number of primary care physicians at the county level for Appalachian and non-Appalachian counties in Kentucky. This study finds that persons living in Appalachian Kentucky counties have statistically-different and worse overall health outcomes, health insurance access, and physician access compared to those living in non-Appalachian Kentucky counties.*

Keywords: *Appalachia, Kentucky, health outcomes, health insurance, health inequality*

The Appalachian region has experienced a longstanding crisis with health inequality (Greenberg, 2016). Residents in the region often face negative socioeconomic statuses, which can contribute to the struggle of affordable healthcare or the decision to delay important health check-ups (Barcus & Hare, 2007). Geographical inequalities are also associated with poor healthcare patterns and deprivation of medical attention, such as issues with access to doctors (McGarvey, Leon-Verdin, Kilos, Guterbock, & Cohn, 2010). In addition, Appalachia also has high rates of heart disease and cancer (Griffith, Lovett, Pyle, & Miller, 2011).

Kentucky offers an interesting opportunity to examine how Appalachia's health issues might vary in comparison to non-Appalachian counties within a single state already experiencing health issues. Researchers have noted longstanding poverty issues in Kentucky, particularly its Appalachian counties (Monroe, Kruse, & Chadwick, 2014). Of Kentucky's 120 counties, 54 are located in Appalachia per the Appalachian Regional Commission (ARC, 2012). Previous studies on health have largely focus on the entire Appalachian region, while few studies focus on specific states and how these differences may exist within Appalachian/non-Appalachian areas in the state (Greenberg, 2016; Mudd-Martin, Biddle, Chung, Lennie, Bailey, Casey, Novak, & Moser, 2014). As such, this study provides value to a topic that is not often discussed. It also provides a useful opportunity to apply theories of development and

inequality and understand how these may unexpectedly impact measures of health inequality over time.

The purpose of the present study is to examine differences in health insurance access, quality of life, and nearby access to doctors among Appalachian and non-Appalachian counties. The authors utilize difference of means testing of secondary data curated by the Robert P. Johnson Foundation to examine if standardized measures differ based on being located in Appalachia. Hypotheses specifically examine if health outcomes, insurance, income inequality, and physician access vary by being in Appalachian portions of Kentucky. Results indicate that Appalachian counties had reduced access to health insurance as well as lower quality of life outcomes. The paper concludes with a deeper exploration of how this relationship impacts residents of Kentucky's Appalachian counties.

Residents of Appalachia experience issues in accessing adequate healthcare and are often at a disadvantage due to the limited health providers in their area (Greenberg, 2016; Griffith et al., 2011; McGarvey et al., 2010; Barcus & Hare, 2007). Geography is consistently linked to the state of healthcare in this region, such as the access to healthcare facilities, travel time, and the financial burden to pay for office visits (Barcus & Hare, 2007). Rural areas in Appalachia often do not have a hospital within an hour from their home and only have limited transportation ability to a primary care facility (Griffith et al., 2011). The eastern end of Kentucky is largely mountainous, with most areas having limited access to interstates. Limited access

places an increased importance on being able to access medical care close to home.

Appalachia's socioeconomic status further influences the framework of the inequities of healthcare (Monroe, Kruse, & Chadwick, 2014; McGarvey et al., 2010; Mudd-Martin et al., 2014; Huttlinger, Ayers, & Lawson, 2004). Individuals living in poverty are at increased odds of exhibiting poor health associated with the disparities in Appalachia (Monroe, Kruse, & Chadwick, 2014). Appalachian communities often have lower incomes as well as lower disposable income which can be budgeted for unexpected health crises or health insurance (McGarvey et al., 2010). Persistent poverty in Appalachia also correlates with the region's higher than national average mortality rates and morbidity rates (Huttlinger, Ayers, & Lawson, 2004). The Appalachian region experiences higher rates than the national average for multiple chronic illnesses as well, which can be better treated through resources like insurance and income (Hege, Ball, Christiana, Wallace, Hubbard, Truesdale, Hedge, & Fleming, 2018; Bombak, 2013; Griffith et al., 2011; Danaei, Rimm, Oza, Kulkarni, Murray, & Ezzati, 2010). The Appalachian region similarly has the highest rates of health issues, such as cardiovascular disease, cancer, hyperlipidemia, hypertension, and diabetes (Griffith et al., 2011). Yet, parts of Appalachian (including some of Kentucky's Appalachian counties) indicate frequent issues in obtaining health insurance to treat these illnesses (ARC, 2012).

Numerous healthcare disparities arise from unhealthy behaviors of Appalachian residents (Hege et al., 2018). It is reported to have the highest number of smokers across the United States, which correlates with health issues like cancer and heart disease (Griffith et al., 2011). Appalachian residents also have increased rates for other unhealthy behaviors, such as not engaging in healthy physical activity or making healthy lifestyle choices (Bombak, 2013). A lack of access to nutritious food leads to obesity, poor physical behavior leads to cardiovascular issues, and mental health is also becoming an issue (Hege et al., 2018). High mortality rates in the United States are linked to risk factors such as high blood pressure, high glucose levels, and smoking, this region is known to exhibit the highest mortality rates for these risk factors across the country (Danaei et al., 2010). Appalachian parts of Kentucky are known to be among the highest areas for heart disease due to deprivation of poor health patterns among individuals and geographic inequality in healthcare facilities (Barcus & Hare, 2007).

Much of Appalachia's health issues are arguably shaped in part by long-term economic trends in the region which have persisted across generations. The spatial stratification hypothesis states that the geography of rural regions limit healthcare opportunities and is marginalized by persistent poverty (Greenberg, 2016). This hypothesis posits there is a relationship between spatial inequality and the inadequacy of healthcare among Appalachia and, due to the longer the distance from a healthcare facility, the more likely individuals are to have healthcare issues (Greenberg, 2016). Residents of Appalachia do not have access to transportation or cannot afford travel expenses (Greenberg, 2016). The inadequacy of available resources and

qualities in a location can shape individual life and quality of life. Spatial inequality is a major geographical issue that impacts individuals due to their location and cultural background. Rural areas are at a disadvantage due to the lack of opportunities available and their socioeconomic background (Greenberg, 2016). Residents struggle to obtain affordable health insurance. Patients are sometimes turned away and do not receive the same health care when they do not have health insurance. Physicians will alter the care and provide an easier fix to the problem when individuals do not have health insurance. Low-income rates and excessive poverty in the region make it hard for residents to afford health expenses.

Kentucky presents an interesting case for examining health in its eastern Appalachian end, as it is a state already experiencing health issues as a whole. In recent decades, Kentucky has been subject to intense issues with addiction, leading to a comparison of its opioid addiction to the 1980s HIV crisis (Sullivan, 2017). In 2019, America's Health Rankings rated Kentucky lowly on drug deaths, obesity, physical inactivity, smoking, and overall health-related behaviors. Moreover, the state was poorly ranked for preventable hospitalizations and overall clinical care issues. In terms of outcomes, the state received low marks for deaths from cancer, cardiovascular, diabetes, mental distress, and premature death. What remains fascinating is that, despite these unhealthy rankings, Appalachian Kentucky counties are still, on average, scoring lower on select health measures than the rest of the state.

A consistent issue in Kentucky is that its social and health issues often remained most concentrated in its eastern end, which is where all the Appalachian counties are located. For example, addiction has often been centered in Eastern Kentucky, particularly Perry, Leslie, Knott, and Breathitt (Estep, 2015), which are all four Appalachian counties. Clay County (also an Appalachian county) was noted for having 2.2 million doses of hydrocodone filed in one year with a population of only 21,000 residents (Galewitz, 2017). Furthermore, Kentucky's poverty is also based largely in its eastern end. In 2018, 12 of 120 Kentucky counties ranked among the fifty counties with the lowest household income in the nation, which included Owsley, Clay, Martin, Lee, Bell, Harlan, McCreary, Wolfe, Knox, Magoffin, Clinton, and Breathitt. All but one (Martin) was in Appalachia. Owsley, an Appalachian county, ranked third, while Clay ranked 13th. The Appalachian Regional Commission labels much of Eastern Kentucky's Appalachian counties as distressed (the lowest possible rating). This ranking means that the counties have experienced generational poverty for thirty or more years.

Ronald Eller's work on uneven development in the Central Appalachian region (which includes Eastern Kentucky) argues that its inequalities are partly rooted in its political economy (Eller, 2008). Appalachia was long understood as an area set aside for resource harvesting, such as coal and timber, which required minimal infrastructure development or investment in crafting a strong, permanent community. Instead, as resources were exhausted, workers and companies would simply travel to other areas and begin anew. Today, this translates into fewer

options for economic and individual growth and the continuation of lack of opportunities.

Method

In this study, four key questions were examined about adequate healthcare in the Appalachian region. First, do health outcomes vary among Appalachian and non-Appalachian counties in Kentucky? Second, does health insurance access vary among Appalachian and non-Appalachian counties in Kentucky? Third, does income inequality vary among Appalachian and non-Appalachian counties in Kentucky? Fourth, does access to physicians vary among Appalachian and non-Appalachian counties in Kentucky? Finally, what is the effect of living in an Appalachian county and the number of primary care physicians? To answer these questions, this study utilizes secondary data from the Robert P. Wood Foundation. This 2018 dataset included measures for health and well-being for all counties in Kentucky and utilized data curated by the Foundation from other existing data sources described in the coming paragraphs.

This study included variables on the following measures: overall health outcomes, access to health insurance, income inequality, and access to physicians in the county. The health outcome variable in the present study is a scale created by the Robert P. Johnson Foundation. It is comprised of five measures (weights and original data source in parentheses): premature death (50%, National Center for Health Statistics or NCHS henceforth), poor or fair health (10%, Behavior Risk Factor Surveillance System or BRFSS henceforth), poor physical health days (10%, BRFSS), poor mental health days (10%, BRFSS), and low birthweight (20%, NCHS). This measure was standardized and expressed as a z score ($M = 0$, $SD = 1$). As a result, it can be interpreted by its distance from the mean of zero. As the intent of this dataset was to identify negative health outcomes, the scores were intentionally multiplied by -1 by the dataset's organizers so that scores above zero indicate worse outcomes. For example, Breathitt, Wolfe, and Owsley counties all have negative health outcomes, so their scores ranged from 2.34 to 2.13, whereas comparatively healthy counties like Oldham, Boone, and Shelby counties ranged from -2.07 to -.151.

The remaining three independent variables come from single data sources curated by the Foundation. Income inequality is based on the income ratio of household incomes at the 80th percentile to incomes at the 20th percentile. This data is sourced from the American Community Survey and results are standardized. Insurance access is based on the number of persons under age 65 who do not have health insurance from the Small Area Health Insurance Estimates. Finally, access to primary care physicians is based on the ratio of physicians available in the county to county residents from the Area Health Resource File, American Medical Association. All three variables are standardized ($M = 0$, $SD = 1$). Again, these scores were multiplied by -1 by the dataset organizers so that positive scores represent worse outcomes.

The study utilized a variable delineating between Appalachian and non-Appalachian counties. Kentucky includes

the following Appalachian counties per the Appalachian Regional Commission: Adair, Bath, Bell, Boyd, Breathitt, Carter, Casey, Clark, Clay, Clinton, Cumberland, Edmonson, Elliott, Estill, Fleming, Floyd, Garrard, Green, Greenup, Harlan, Hart, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lewis, Lincoln, McCreary, Madison, Magoffin, Martin, Menifee, Metcalfe, Monroe, Montgomery, Morgan, Nicholas, Owsley, Perry, Pike, Powell, Pulaski, Robertson, Rockcastle, Rowan, Russell, Wayne, Whitley, and Wolfe. In all, there are 54 Appalachian counties and 66 non-Appalachian counties in Kentucky. This variable was modeled as a dichotomous dummy, where zero equaled being a non-Appalachian county in Kentucky, and one equaled being an Appalachian county in Kentucky.

Based on the four major questions and the variables available, this study examined four hypotheses designed to add new information about differences in healthcare among Appalachian and non-Appalachian counties in Kentucky.

H1. First, the authors examined health disparities. Based on extensive literature on health in Appalachia, the authors hypothesized that residing in an Appalachian Kentucky county will statistically correlate with negative health outcomes when compared to non-Appalachian Kentucky counties.

H2. Next, the authors examined health insurance access. McGarvey and associates' (2011) work on health care disparities in Appalachia argues that residents of Appalachia frequently lack health insurance or sufficient funds for insurance payments. As a result, the authors hypothesized that residing in an Appalachian Kentucky county will statistically correlate with lower health insurance access when compared to non-Appalachian Kentucky counties.

H3. Third, the authors examined income inequality. Mudd-Martin and associates (2014) recently published on the idea of health behaviors and socioeconomic status. Here, they argue that inequities in socioeconomic status are linked to unhealthy lifestyle behaviors. Therefore, the authors here hypothesized that residing in an Appalachian Kentucky county will statistically correlate with higher income inequality when compared to non-Appalachian Kentucky counties.

H4. Finally, the authors examined access to physicians within one's county of residence. Huttlinger and associates (2004) provide background on the limited access to healthcare Appalachia and dramatic rates of morbidity through Appalachia. Residents living in Appalachian counties generally suffer from spatial inequality and cannot afford travel expenses. Here, again McGarvey and associates' (2011) work applies to the spatial inequality theory, which argues that numerous Appalachian counties physically lack health care providers, and this exacerbates health outcomes overall. Based on these findings, the authors hypothesize that residing in an Appalachian Kentucky county will statistically correlate with lower access to physicians when compared to non-Appalachian Kentucky counties.

Results

Based on the continuous standardized variables available in the dataset and using a county’s status of being inside/outside Appalachia, the authors elected to use difference of means testing to examine the above hypotheses. In each case, an independent samples t-test will provide statistical evidence of differences of means in each hypothesis based on being inside an Appalachian Kentucky county

Table 1 examines descriptive statistics for variables in this study. Again, note that four of the five variables are standardized z scores ($M = 0, SD = 1$). When looking at the ranges (min and max), the data show how scores are distributed inside the z score. Here, negative scores are somewhat counter-intuitive, as a negative score is coded as being a more desirable outcome (e.g., more physician access). Note also that increasing distance from the mean of zero indicates cases either getting worse (a counterintuitive positive mean) or better (negative mean). The study includes 45 counties which are designated as being in Appalachia per the Appalachian Regional Commission, and this variable will be used to determine how the other variables in the table might differ based on being an Appalachian or non-Appalachian county in Kentucky.

Table 2 lists the results of difference of means testing based on the hypotheses in this study. In hypothesis 1, the analysis indicates there is a statistical difference in health outcomes between Kentucky’s Appalachian and non-Appalachian

counties. Here, Appalachian counties scored a mean of .649 vs non-Appalachian counties -.536, indicating that overall Appalachian counties had negative health outcomes. This supports rejecting the null hypothesis.

In the second hypothesis, the analysis indicates a statistical difference between Appalachian and non-Appalachian counties regarding health insurance access. As with the first hypothesis, Appalachian counties on average scored poorly in terms of insurance access when compared to non-Appalachian counties in the same state. This finding again supports rejecting the null hypothesis.

The third hypothesis considers how Appalachian counties may fare differently in terms of income inequality. The analysis supports this to be the case. Appalachian counties scored on average .556 (which indicates higher income inequality) while non-Appalachian counties (at -.472) showed lower income inequality levels. This supports rejecting the null hypothesis.

The final hypothesis examines if Appalachian counties may experience less access to physicians in their counties. Again, the analysis supports this to be true in Kentucky, albeit with slightly less distance from the mean for both Appalachian and non-Appalachian counties. Here, Appalachian counties scored .072 which, while indicating lower access to physicians, is not as extreme as the previous three findings. This supports rejecting the null in the fourth hypothesis.

Variable	Mean	Standard Deviation	Min	Max	Obs
Health outcomes z score	-.002	.873	-2.07	2.34	120
Income inequality z score	-.009	.966	-1.83	3.00	120
Health Insurance z score	-.001	1.000	-3.14	1.97	120
Physician access z score	.001	.978	-3.09	1.50	120
Appalachian county status (0=not Appalachian county, 1=Appalachian County)	.45	.499	0	1	120

Table 1. Descriptive Statistics

Variable	Group	n	Mean	SD	t	df	p
H1: Health Outcomes	Non-Appalachian County in KY	66	-.536	.516	10.03	118	.001
	Appalachian County in KY	54	.649	.772	10.03	118	.001
H2: Health Insurance Access	Non-Appalachian County in KY	66	-.415	1.00	-5.655	118	.001
	Appalachian County in KY	54	.508	.732	-5.655	118	.001
H3: Income Inequality	Non-Appalachian County in KY	66	-.472	.808	-6.822	118	.001
	Appalachian County in KY	54	.556	.838	-6.822	118	.001
H4: Number of Primary Physicians	Non-Appalachian County in KY	66	-.059	.987	-.0731	118	.023
	Appalachian County in KY	54	.072	.972	-.0731	118	.023

Table 2. *T-test Results Comparing Health Care Outcomes in Kentucky.*

Discussion

Appalachia has a serious health issue at hand on multiple fronts. This study confirms that Appalachian counties in Kentucky scored undesirably in terms of health care access, insurance access, physician access, and overall health outcomes. Moreover, findings about income inequality in Kentucky’s Appalachian counties matches regional research longstanding findings. These findings are no surprise and simply confirm what is already known. However, the noted difference between Appalachian and non-Appalachian counties in a single state (namely Kentucky) is intriguing and raises many questions about what it really means. This study indicates that, in at least one state’s case, the negative impact of living in Appalachia is so strong that, when analyzed as part of a state (which is struggling with its own health issues), the impact remains present and worse than the remainder of the state.

This study reiterates that a change needs to be made in the healthcare of Appalachia, but the great difficulty then is figuring out where to begin. Kentucky offers a valuable place to start, yet the options at first glance feel despairingly limited. In Eastern Kentucky, the state’s many budgetary woes (worsened by the appearance of COVID in 2020) limit new approaches. Existing hospitals in the region are probably not suited to create changes that will alter the region. In fact, the hospitals (and to some degree, physicians in the area) are largely focused on solving issues on the back end of health problems, such as treating diabetes or lung problems, rather than addressing the front end by helping residents adjust diets and longstanding habits like smoking. Thinking again of spatial inequality theory, the eastern end of the state presents very different geographic features from the rest of the state, making access to healthcare a serious issue. Whereas much of Central and Western Kentucky are rolling hills or flatland areas, Eastern Kentucky presents a rugged mountain terrain

unfavorable for most multi-lane highways. Likewise, there are no major projects that will rapidly undo generations of uneven development in the region.

Instead, innovative, low-cost or free community-level options may provide the best starting point. For example, establishing community-level programs where residents can take an active role in well-being may work. The local farmer’s market may be one place to begin (Knoempel, Brewer, Mudd-Martin, & Stephenson, 2020). Farmer’s markets provide an opportunity to bring communities together in discussing healthy food options, the importance of unprocessed foods, and rethinking unhealthy diets for longer, healthier lives. Farmer’s markets really require no more than public space and tables, and in rural areas often organically appear in parking lots. This may also support local economic growth in the region by offering local business opportunities even while it creates a sense of togetherness and identity (Peine, Azano, & Schafft, 2020; Chesky, 2009). Other options could be finding ways to incentivize physical activity through local clubs and organizations (Ball, Abbot, Wilson, Chisholm, & Sahlqvist, 2017). For example, having a morning walking club could help create a useful approach to activity while also encouraging social support and community growth. This also incentivizes towns and cities providing a space for activities, whether a developed city park, a planned pathway around the existing downtown area, or a mowed pathway in a publicly available field.

At the state level, efforts to continue decreasing rural isolation in Eastern Kentucky improves healthcare access while also providing economic possibilities to new employers. Although the area is often rugged, the Bert Combs Mountain Parkway is one such successful effort to connect eastern towns and cities with the remainder of the state, and it continues to expand today. This creates a linkage to Lexington for major

medical care (such as heart attack care), whereas other eastern counties have less access. By opening these areas to larger transport trucks, it also creates the opportunity for new businesses to relocate to the area amid a large unskilled labor pool. New employers create further options for economic development by supporting tax bases, attracting new residents, and stabilizing land values. Over time, this can create communities with improved economic futures.

Kentucky's State Loan Repayment Program also offers a valuable angle for attracting and potentially retaining medical caregivers in the region. This program allows student loan repayment in exchange for a two-year commitment to serving in Kentucky. The program includes physicians, nurse practitioners, and substance abuse counselors, and pharmacists, to name a few. The program has been in place since 2003. Reflecting on America's Health Rankings data from 2003 to present, it's not clear if this program has been directly successful in improving health rankings. However, promoting this and similar programs (or perhaps extending the period of service for more than two years) would be a valuable approach to bringing more medical care to the region.

Another consideration is how variables not examined in this study impact health outcomes. For example, education remains a central variable in predicting one's health outcomes (Center on Society and Health, 2015). Education comes into play through degrees (Bachelors, Masters, etc.) which create access to better jobs, and therefore better pay and potentially better insurance care. Employers may also offer free health care options, such as free annual check-ups. Education is critical in regards to following complicated medicine regimens, avoiding poor health behaviors, and being versed in healthy eating options. As such, supporting increased education in Kentucky, while a costly, lofty proposal, may prove to pay far greater savings generations down the line.

Finding ways to encourage Kentuckians to proactively impact their health outcomes would also be a valuable way to approach this. One option could be to transition the focus on chronic illness care to preemptive care in the state in general. For example, finding national or state support for offering free or reduced cost annual check-ups to all Kentuckians regardless of employment or insurance status could help identify chronic issues such as high blood pressure and address them early, creating better health over time and improving health outcomes (Elton & Ural, 2014). Treating chronic illnesses later in life prove far more costly and deadly, while mitigating these illnesses earlier in life can limit their long-term impacts. This would be a major shift in care approaches but is something that county health programs may be able to rally around as a cost-reduction approach over time.

Appalachia has faced unique inequalities unseen in other regions in the United States. Rural Appalachia continues to face poverty issues and lack of quality of life. Appalachians are at a disadvantage of improving their quality of life due to simply a lack of resources in this area. Indeed, residents suffer from inadequate healthcare and geographical inequalities; This region has the highest rates of diabetes and heart disease in the country. Unhealthy habits such as smoking and poor food options (e.g.

living in a food desert) remain an issue. Spatial issues, such as the mountains, also create access issues for medical care. Overall, unless this region finds ways to make regional changes, it will continue on this path.

There are options available, however, and these largely require rethinking how healthcare works in places like Eastern Kentucky. Given its location as part of Appalachia, Eastern Kentucky provides an ideal testing ground for improving health throughout Appalachia (particularly central Appalachia). It also provides an extraordinary opportunity to study how spatial inequalities can be challenged in many other areas through innovative approaches. Furthermore, the area provides an opportunity for the people of Appalachia to take on a new, central role in embracing their own health through community-driven projects.

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The Economic Impact of Paradise Cove Aquatic Center in Richmond, Kentucky

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Abstract: *One of the most effective ways for rural communities to improve the local economy is by exploring opportunities related to tourism. When communities focus their resources on expanding and improving the tourism industry, it leads to additional opportunities for these communities to increase their revenue, provide jobs and revitalize the local economy. Like many other agencies, the Richmond Parks and Recreation Department has gradually expanded the tourism industry within the City of Richmond in Madison County, Kentucky. To help continue the expansion of this industry, Paradise Cove Aquatic Center opened in 2008. This decision was made because waterparks were becoming a more desired aspect within the tourism industry because they “offer the promise of serious tax dollars as well as a mix of temporary, seasonal and permanent jobs” (Rice, 2013). Since the opening of this waterpark, there has been a positive impact on the surrounding economy as well as improving tourism for the City of Richmond and Madison County, Kentucky. The Paradise Cove Aquatic Center has an approximate 1 million dollar impact on the local community (Sims, et al., 2016) annually. As recreation professionals, it is important to understand the economic impact of the facilities within our communities. By understanding this, community leadership may see which aspects of the tourism industry are the most beneficial to the community. The goal of improving the tourism industry within local communities is to meet the needs of the people and increase the capital flowing into our local economies.*

Keywords: *Economic impact, waterparks, rural communities, rural economies, tourism, community revitalization*

Many rural Eastern Kentucky communities struggle economically for a variety of reasons, including county unemployment and poverty rates being higher than the national average. Some of the poorest counties in the nation are located within Eastern Kentucky (McGreal, 2015). Many of the towns within these counties tucked away in the hills of Eastern Kentucky were once reliant on the coal industry as a sole economic engine. “Coal-industry jobs in the region have declined from almost 125,000 since the mid-1980s to less than half that number today” (Cates, 2015), resulting in many rural communities becoming more isolated and increased economic struggles. As time goes on, many of these counties across the Appalachia harbor towns with declining population, business, and function. Perhaps this declination is a result of prolonged

reliance on any one industry or employer. For many of these towns, community leaders need to make tough decisions related to the future of their community and residents.

Many of these rural communities are searching for ways to increase their community revenue to help revitalize their local economies. Specifically, community leaders are seeking out avenues to take advantage of rural tourism. Depending on what natural resources or rich history the community has to offer will determine what type of tourism is best to promote for that area. Tourism opportunities for rural communities include things like adventure tourism, cultural tourism, ecotourism, wildlife tourism, natural resource tourism, and so forth. Overall, rural tourism is experience-oriented and focuses on preserving local traditions, heritage, and culture. Many rural Kentucky towns

have an incredible potential to develop a rural tourism industry, as tourists want to see and experience new places away from and outside of their routine.

Madison County History

Madison County, Kentucky, where Daniel Boone explored the area in the 1770s, is one of the oldest counties in the Commonwealth of Kentucky. Boone established Fort Boonesborough in 1775, and shortly after Kentucky County was divided into three counties known as Lincoln, Jefferson, and Fayette. Madison County was formed out of what was previously Lincoln County in 1787. Originally, the village that held the county seat was called Milford but was moved to the new community known as Richmond, named after Richmond, Virginia.

At the turn of the 19th century, Kentucky, as well as Madison County, began to grow. It was during the American Civil War that Richmond was the site of the second largest battle fought in Kentucky. Madison County is also the birthplace of Kentucky governors such as James B. McCreary and Keen Johnson, the well-known emancipationist, the “Lion of White Hall”, Cassius Clay, U.S. Supreme Court Justice Samuel Freeman Miller, and frontiersman Christopher “Kit” Carson. Madison County is rich in history with many historical markers strewn throughout the area.

Rural Tourism

Finding a sustainable form of rural tourism is important to help the economic growth of many local communities. Tourism that focuses on the art, culture, and heritage of rural locations which results in the economic and social development of communities is known as rural tourism. Tourists are constantly searching for experiences that are “predominantly in a natural environment, mesh with seasonality and local events and are based on preservation of culture, heritage and traditions” (Lal & Sharma, 2013). Many people are eager to leave the bustling cities for even a weekend getaway in a rural hotspot. The Ann L. Durham Lake Reba Recreational Complex in Madison County, Kentucky is a perfect example of a rural tourist destination. It is a great location for families to get away from their busy lives and enjoy some quality time together.

Waterpark Industry

A waterpark has many things to offer to a rural community, such as a mix of jobs and a step in the right direction to increase the local economy. Although the tourism sector is booming, the one thing that might hold communities back from installing a waterpark is financing. Many industry consultants state that “the lending situation has become especially challenging of late, with even major brands turning to alternative sources of construction financing for new projects” (Rice 2013). For Recreation and Park Professionals, these alternative sources may include obtaining grants, infrastructure assistance, free land, tax credits and other financial resources.

Paradise Cove Aquatic Center History

Like many other communities, Richmond leadership have embraced the tourism industry to diversify the local economy and provide residents with additional quality of life opportunities. During the 1990’s, the City of Richmond developed what is now the Ann L. Durham Lake Reba Recreational Complex. This is a regional park which includes a 75-acre lake, the 225 acre Gibson Bay Golf Course, Paradise Cove Aquatic Center, Adventure Falls Miniature Golf Course and Batting Cage Complex, walking trails, athletic facilities, a dog park, shelters, and an all-inclusive playground. The Paradise Cove Aquatic Center was opened in 2008 and has many different attractions for the entire family. This facility features a well pool with diving boards, an ADA lift, an Aqua Climb rock climbing wall, and a zip’n rope swing. The feature pool has a zero-depth entry making it ADA accessible and has a young swimmers play structure with water sprays, a net climb, and a dumping bucket. There is an 18-inch shallow pool for younger children and a whirlpool for older kids. There are three slides within this facility, a 40-foot straight chute slide, a 40-foot spiral slide and a kids slide. In addition to these amazing features, there are restrooms, lockers, concessions, shade structures, and lounge chairs to help accommodate guests.

Method

The purpose of this analysis was to examine the economic impact that the Paradise Cove Aquatic Center has on the local economy in Madison County, Kentucky (Sims, 2016) and use this as a case study to determine if waterparks might provide an economic opportunity for other rural communities in Kentucky. The researchers conducted a literature review analysis using scholarly research articles to investigate the economic impact of waterparks in rural Kentucky. Each scholarly article was analyzed to discover the benefits that waterparks had on rural tourism in Eastern Kentucky.

The researcher examined the study conducted by Sims et al. (2016) and discovered that they used on-site surveys to collect the data needed for the study. The survey they used was adapted from an Economic Impact Questionnaire previously used by Crompton (1999). The data was collected during the 2016 waterpark season ranging from May to September. The final sample included data from five Kentucky waterparks: Somersplash Waterpark, Venture River Waterpark, Juniper Hill Aquatic Center, Paradise Cove Aquatic Park, and Tie Breaker Family Aquatic Center. They administered surveys randomly to participants throughout the entire season and once all data was collected, it was imported into the IMPLAN Input-Output Model Software and SPSS software. This was completed to analyze the direct impact, indirect impact, and induced impact of waterparks in Kentucky. The direct impacts are all direct effects the organization has on the region due to the organization's operations. The indirect impacts are not a direct result of the project, often produced away from or because of a complex impact pathway. The induced impacts are the results of increased personal income caused by the direct and indirect effects.

Total Impact	Employment	Labor Income	Value Added	Output
Direct Effect	16.74	\$315,113	\$385,889	\$763,819
Indirect Effect	1.23	\$35,499	\$63,888	\$127,726
Induced Effect	1.71	\$51,679	\$97,118	\$178,959
Total Effect	19.68	\$402,290	\$546,895	\$1,070,505

Table 1. Economic impact summary for Madison County, KY (Sims, Bradley & Maples, 2016)

Analysis

According to the 2016 study conducted by researchers Dr. Sims, Dr. Bradley and Dr. Maples, the Madison County, Kentucky population consisted of 87, 824 residents. It was found that based on the 2016 attendance of 56,699 visitors to Paradise Cove Aquatic Center, it was estimated that this facility contributed approximately \$1,070,505 to Madison County’s economy. The researcher found that the most recent approximate population in Madison County, Kentucky was 92,987 found in 2019, which increased since 2016. In comparison to attendance at Paradise Cove Aquatic Center in 2016, the admissions in 2019 was down by 1,819 admissions for a total of 52,880 total admissions for the season. Although the admissions rates were lower, the profit for the Paradise Cove Aquatic Center was up \$94,568.57. Table 1 shows the details of the economic impact summary.

Discussion

The importance of this study is to determine whether the addition of Paradise Cove Aquatic Center in Madison County, Kentucky has positively impacted the local economy. It was found that in 2016, this facility contributed approximately \$1,070,505 to Madison County’s economy. Since the profits for this facility in 2019 were higher in comparison to those in 2016, it can be inferred that Paradise Cove Aquatic Center continues to positively impact the economy. The economic impact categories that are positively affected by Paradise Cove Aquatic Center include: lodging, concessions, restaurants, gas stations, grocery, gas, entry, parking, park rental, retail, entertainment, and services. Just by having this facility, all these other industries were impacted which results in more jobs and an increase in the local economy. The Paradise Cove Aquatic Center impacts the local job market directly by producing an estimated 16 jobs and another 2 jobs either indirectly or induced (Sims, Bradley & Maples, 2016).

The more tourists enjoy a facility or location, the longer they tend to stay, and, as a result, spend more money in the surrounding area. This is the outcome that all agencies hope to see when evaluating the impact that their facilities have on the surrounding economy. By seeing how the economy is affected, this can lead agency leaders to decide whether to continue with the facility or to expand to other facilities. This also can tell these leaders if they are meeting the needs and wants of not only their residents, but the tourists that are coming to visit. Only by expanding or improving the tourist attractions will cities continue to flourish and not be left behind by.

As the data shows, the addition of the Paradise Cove Aquatic Center to Madison County, Kentucky has helped improve the local economy in this area. The next step for the city is to evaluate where they want to improve on next within the tourism industry and maybe an additional waterpark or splash pad area is the right move for them to make. By adding similar leisure activities and facilities to the area, it will assist with increasing the local economy along with improving the tourism to the area.

Recommendations

Madison County has a rich history of famous Kentucky leaders, historic sites and museums, beautiful county and city park systems and so much more. There is always room to improve within the tourism industry to find more ways to increase the local economy. There is a method that many recreation professionals use is to analyze the six components which comprise a destination. The destination is often referred to as an amalgam of six A’s. These include available packages, accessibility, attractions, amenities, activities and ancillary services. Agencies are constantly reviewing the success of their attractions and finding ways to expand the areas of success to different destinations throughout their communities.

The available packages for Paradise Cove Aquatic Center include concessions pricing, daily admission fees, season pass

admission packages, party and facility rental packages and swimming lesson packages. The Richmond Parks and Recreation Department has put a lot of thought into the pricing of above packages. Their goal is for all residents to be able to use the facility and not be excluded due to high prices. The current daily admission prices for children (3 & under) FREE, children (4-13) \$5, Youth (14-17) \$6, Adults (18-59) \$9 and Seniors (60 & over) \$5. These prices have remained the same for the past few years so residents are able to continue to enjoy the facility without worrying about an increase in prices. A recommendation would be for families with more than two children to get a reduced cost per child. This can help lower income families with multiple children enjoy a day or evening at the park without focusing on how much money they are going to be spending.

The next concern is accessibility. This aquatic center is ADA compliant which includes zero depth entry to their feature pool along with an ADA lift into the well pool. The restrooms have accessible stalls and sinks. The reception and concessions counters are at an appropriate height for employees to interact with patrons that are wheelchair users. The recommendation for accessibility would be somehow giving patrons who are wheelchair users access to the two 40-foot slides that are featured. For safety reasons, the best option would be to install an elevator to carefully take these patrons to the top platform. There would need to be restrictions on who could use the elevator to make sure that children without disabilities are not using the elevator to quickly get to the top and skip to the front of the line.

Regarding the Paradise Cove Aquatic Center being easily accessible to low income families this has been a concern for many families. Although, through carpooling and other methods, many of these families can make it work, it is not nearly as accessible to this demographic as it could be. The recommendation for this aspect of accessibility would be to install a splash pad area in a downtown centralized location. The location that seems to check all the boxes for accessibility, highly trafficked, and lower income families is the Irvine McDowell Park located in Downtown Richmond, Kentucky. By installing a splash pad in this area, the amount of people who can easily access this has increased significantly. Many families could save gas money and admission money if a splash pad were added to this park. By doing so, this is creating a safe and fun environment for everyone to relax and cool off in the summer heat. This can also help improve the local economy by bringing in more tourists to this area.

For many waterpark goers, one of the most looked for attractions are the slides. This aquatic center has 3 total slides. The first slide is a smaller sloped slide located within the feature pool. The second slide is a 40-foot straight chute slide and the final slide is a 40-foot spiral slide. To ensure the residents of the community and tourists continue to use the facility, it is important to evaluate the attractions located within. This was recently done at this facility by installing the Aqua Climb rock climbing wall which is frequently used by patrons. As a recommendation in this area, to help find out what the residents

of Madison County want to see in their aquatic centers, there should be a survey that pool patrols can fill out at the beginning of each season. This can help ensure that the needs and wants of the residents are being met.

The amenities of the current aquatic center in Richmond, Kentucky are phenomenal compared with similar aquatic facilities in the area. It is important for agencies to continue to improve their amenities to help appeal to the needs and desires of the patrons. A recommendation for this would be at the beginning of the season and throughout the season to make sure all necessary maintenance is done on the current features. Patrons will be frustrated if their favorite feature is out of order or undergoing maintenance for long periods of time. Another recommendation would be to add a smaller “kiddie” pool separate from the current feature pool. The current area for smaller kids is great, but it is often overrun by older kids and tends to be overstimulating for toddler aged children. By putting this pool separate from the larger pool, it can help deter older kids from running through it to get to other parts of the pool. It will also free up space in the current area as a lot of the parents who use this section are sitting or helping their children walk/swim.

Although the concept of just having a waterpark might seem like it is appealing to everyone, this might not necessarily be the case. It is important for recreation professionals to remember that not everyone enjoys the same type of recreation and there should be programming that can appeal to all sorts of people. One current activity that is offered at this facility is a dive-in movie, which is a great experience for a lot of people. Not all children want to spend countless hours swimming, some need different types of entertainment and what better way to do this than show a movie. A recommendation for this area would be to expand the programming related to the aquatic center. One way would be to offer more dive-in movies instead of just one a season. Another way could be to host events in the park near the aquatic center, this could be a chalk art festival, music festival, nature walk, etc. By doing this, there will be a bigger appeal to more people than those who are just going to the aquatic center. Now, people who are attending these other events are already in the location and can swing by the aquatic center and enjoy a few hours cooling off in the pool.

The final area to be evaluated is ancillary services which are medical services not provided by acute care hospitals or healthcare professionals. Madison County offers many of these services already. A recommendation for this would be to have a direct line to the ambulance service in case of an emergency. This could increase the speed of services by reducing the time being spent on making a call to 911 dispatch. These recommendations were made to help Richmond move forward and continue to expand within the tourism industry.

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Social or Special Interests: How Unions Influence Spending

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Abstract: *Unions are in a decades long decline, heading for the point of non-relevance. To better understand what this change will entail, this paper asks: how does union strength affect state spending? Previous research on unions has exhausted the answers to national and congressional effects, so looking at spending on the state and local level will add more clarity to our understanding of union influence. Independent data were used to test several areas of spending with multivariate regressions. Additionally, pairwise comparisons tested whether union influence differs across areas. It was found that unions have a positive influence on spending independent of the Democratic Party, and do not have even effects across areas of spending.*

Keywords: unions, state spending, union influence

Unions have experienced a continuous decline in membership since their peak in the 1950s. With the well documented effects of right-to-work laws on union membership (i.e. Raymond, Shulman, & Weiler, 2004) in combination with historic trends, this suggests that they may disappear altogether. Despite this possibility, unions have thus far remained an influential political player, even increasing their political action committee (PAC) contributions over time (Masters & Atkin, 1996). In light of this decline, it is important to investigate how unions are influencing our society in order to better understand what their absence would entail. Congressional level and legislative effects (or lack thereof) have been heavily explored (Masters & Delaney, 2005), but substantially less analysis has been paid to how unions affect lower levels of government or what their presence means for public expenditures. As such, this paper will confront the following question: How does union strength affect state and local expenditures?

To answer this question, it must first be understood how unions are using their political influence. There are three primary explanations in the literature, each of which are explored in this paper. Of the three, the *social-interest* school is identified as both the most convincing theory of union political influence as well as the most promising for future research. Using this as a starting point, this study hypothesized that 1. increasing union strength will increase social expenditures, 2. that this effect will be independent of party control, and that 3. the effect will be even across types of expenditures. A series of regressions on different areas of public expenditures were then used to test these hypotheses. The first two hypotheses have nuanced support, with their basic assertions being true, but with certain exceptions being raised. The final hypothesis, on the other hand, came to a

puzzling conclusion which provides questions for future research. With these conclusions in mind, it is easy to see that the continued decline of unions will have a serious influence on the future of state public expenditures.

Literature Review

In response to the question of how unions are using their political influence, there are three main bodies of scholarship. The first perspective, and for a long time most popular, is that of the *pluralist* school, whose scholars present the conclusion that unions work like any other interest group and would only have incentive to influence public spending if that spending would directly benefit union members (Barash, 1947; Freeman & Murdoff, 1985; Masters, 1998). The second view is that of the *Democratic coalition* school, which argues that unions in the United States have become so engrained in the Democratic coalition that their political influence is exclusively expressed through the Democratic Party (Greenstone, 1969; Dark, 2001; Francia, 2010). The final current of thought is that of the *social-interest* school, a recent addition to the literature that argues that unions have started to direct their independent political influence toward broader, more socially-minded ends (Coleman, 1988; Ha, 2008).

Pluralist School

Scholars of the *pluralist* school begin from the straightforward assumption that unions work similar to other interest groups, competing with other interest groups to achieve narrow and specific political goals that secure special advantages for their members. In this view, unions will primarily support public expenditures only when their membership can derive a

direct benefit from said expenditures (Barash, 1947; Delaney, 1991). It is possible for unions to affect broader areas of public expenditures, but they will only do so when pursuing ties with other groups who will increase labor's ability to secure its special interests (Masters, 1998).

The early development of this school of thought can be seen through Barash (1947), who used historical examples to characterize unions as a group which only turns to politics when its familiar strategy of collective bargaining cannot secure its interests. Unions would therefore only attempt to influence social spending to raise their wages, and only when they could not achieve that by strike or boycott. The application of this early thought to the present day can be seen in the work of Bennett and Taylor (2001), who argued that unions exist exclusively to secure a series of benefits and protections for workers and that the continuous decline of union strength is indicative of unions having stabilized workers' interests and rights to the degree that they are no longer important for workers.

Scholarship in this school can trace its more modern roots back to the seminal work of Freeman and Murdoff (1984). When writing on the political power of unions, the authors characterized unions as a tragicomic special interest group that, while primarily looking to preserve its monopoly powers, has only seen legislation that it favors pass if it has been of a more "social" nature. Even the success of this social legislation is through "no virtue of their own", as the authors showed with specific legislative examples that such bills passed not by labor efforts, but rather by existing sentiments in the electorate or in Congress. The low success rate of unions is a recurring theme in this literature, although Delaney's exploration (1991) found that at times specific political efforts were able to secure legislation that advantaged unions. A case study of the Communication Workers of America (CWA) also reinforced the perspective of unions as a narrow interest group, as the application of organization theory showed that the CWA was simultaneously using collective bargaining, politics, and organization to secure a private advantage for its membership (Katz, Batt, & Keefe, 2003). Those who ascribe to the *pluralist* school have also been careful to make the distinction between labor using the Democratic Party and being a part of it, as can be seen in an exploration of the 1978 House elections that concluded that party was incidental to member's voting records when predicting union support (Gopoian, Smith, & Smith, 1984).

The most recent scholarship in this tradition has carefully incorporated literature showing unions' influence on areas that do not provide a union advantage. An example of this is present in Masters' (1998) examination of the AFSCME, where he presented the idea of unions engaging in interest group alliances to achieve their purposes. Nevertheless, he pointed out that both the contributions and official positions of the AFSCME support the fact that their reason for being is their members. Asher's (2001) extensive contribution took an overall similar approach, explaining that while unions are too complex to follow a single strategy, ultimately, they are primarily looking out for special interests. An example he cited of this being the strategy that the AFL-CIO's then recently elected president, Sweeney, adopted

when opposing permanent normal trade relations with China. Labor was willing to form coalitions to oppose the measure, but ultimately their opposition was rooted in their special interests. When later looking at labor's campaign efforts in 2000, Masters (2004) returned with the claim that the bottom line of union effectiveness is in how its actions affect membership, as that is its primary interest.

Critics of the *pluralist* school have claimed that its constituent scholars have too quickly concluded that there is no social orientation of unions from separate research where comparativists discredit class orientation (Coleman, 1988; Radcliff & Saiz, 1998). Their evidence of this rested in the success of unions in achieving broader social aims, both in the form of legislation and expenditures. *Pluralists* can reply with the theory of interest group coalitions, but it remains difficult to discredit findings of union influence on non-union interests. Another criticism is based on whether or not unions are really independent enough of the Democratic Party to act as a usual social group. While scholars of the *pluralist* school have made claims of independence, the overwhelming disparity in union support for Democrats compared to Republicans even following events like the passage of NAFTA has suggested that unions may not have much of a choice of who to support (Masters & Zardkoohi, 1986; Dark, 2003).

Democratic Coalition School

The body of scholarship following the *Democratic coalition* school focuses on the relationship between the Democratic Party and labor in order to explain what political influence unions may have. These scholars vary in the degree to which they can imagine unions affecting the policies of the Democratic Party either as a matter of desire or ability, but almost unanimously agree that if unions were to affect public expenditures, they would need to do it exclusively through the mechanisms of the party they have aligned with (Greenstone, 1969; Dark, 2001). As such, unions may affect public expenditures, but it is through the Democratic Party that they do so.

The origin of this perspective might be found in the influential work of Greenstone (1969), who is often cited for his contributions in understanding the relationship between the Democratic Party and organized labor. He presented unions as having assumed an integral part in the Democratic Party, aggregating political demands of other groups rather than acting primarily as an interest group seeking special advantages. The result of this was a dependence on the Democrats that made labor into a nationwide electoral organization for the Democratic Party. Evidence of this dependence can be seen in research showing that unions invariably prefer Democrats in their PAC allocations despite claims of nonpartisanship (Masters & Zardkoohi, 1986). Amenta and Poulsen (1996) explored state-level outcomes for New Deal social spending programs, and their findings were consistent with Greenstone's assertions. Labor was willing to help with New Deal programs, despite worries that some programs would undercut union members' wages, because of the strong Democrat-labor alliance.

More recent investigations from this school have shown that despite the challenges of general union decline and the Reagan presidency, the labor-Democratic party alliance continues to characterize the political influence of unions (Dark, 1996; Francia, 2010). Using the close relationship between the AFL-CIO and the Speaker Wright in the 1980s as an example, Dark claimed that the Democratic Party relies on unions and, in return, unions can only advance their own interests through the Democratic Party. Dark (2000) presented further proof of this reliance in the “energetic” efforts of unions to elect Democrats in the 1998 elections. This perspective is expanded in his book where Dark (2001) continued to engage with the seeming paradox of declining labor membership and intensifying political action. He resolved this paradox through examination of the symbiotic relationship between labor lobbyists and Congressional Democrats. Democrats, he explained, view unions as the lynchpin of social reconstruction, but unions only achieve success when it fits into wider political decision making. Dark (2003) also contributed an understanding of the nature of labor’s inclusion in the two-party system with an examination of their bargaining strategies. While unions can technically break party lines, and in about 4% of endorsements do so, actually defecting is not a serious strategy that unions can employ. As such, any influence that they have must be almost entirely expressed through the Democratic Party. This tradition of thinking is still strong, as can be seen in Francia’s (2010) interpretation of labor as a campaign and electoral arm of the Democratic Party when considering PAC contributions.

Critics of this school consider the labor-Democratic alliance to be overstated, citing research showing that unions are attentive almost exclusively to voting records rather than party affiliation (Gopoian, Smith, & Smith, 1984). *Democratic coalition* scholars can answer this by pointing out the disparity in endorsements, but the fact remains that unions have been willing to endorse Republicans when they can count on them to support union legislation. Additionally, researchers who have included both party and union strength into their models are quick to point out that unions have an independent effect, which is hard for this school to explain (Radcliff & Saiz, 1998). When unions affect policy liberalism in the absence of Democratic Party control, it is hard not to conclude that they must have some wider options for influencing politics.

Social-Interest School

Those who support the *social-interest* school argue that while unions undeniably are concerned with the interests of their membership, unions have adopted broader social goals that now characterize their political action (Coleman, 1988; Albert, 2014). From this assumption, these scholars concluded that unions will influence all areas of public expenditures, even those in which union members have no direct stake. They will do so because they are acting out of social-interests rather than the special-interests suggested by earlier scholars.

An early example of this literature (which seems to have evolved out of even earlier, now mostly abandoned, conceptions of American unions as vehicles of class struggle) can be seen in

the arguments of Coleman (1988). Using ALF-CIO policies as evidence, he made the case that unions have transitioned from their formative interest group years into a social movement. They have gained influence through cultivating an alliance with all disenfranchised low-wage workers, including those who are not unionized, and are now obligated to advocate for the broader interests of that group. This is a conclusion commonly echoed by scholars of this school, such as Radcliff and Saiz (1998), who found that unions seem to have an interest in all areas where lower-class citizens have a great public stake; furthermore, they used pooled time series data from 1964 - 1982 to show that unions had a systematic effect on policy liberalism divorced from effects of the Democratic Party. Looking at “veto actor” responses to globalization, Ha (2008) found a strong union effect on welfare spending, which further argues for the concept of unions as agents pushing for social interests. Another approach within this school was to look union actions through the perspective of public goods theory, suggesting that union members are both providers and consumers of public goods, which will result in unions positively affecting the provision of public goods even in areas where there are no special benefits for union members (Marlow & Orzechowski, 1996).

Scholars of this school have also contributed to the body of literature on union revitalization – the catch-all term for the efforts of unions to reverse the current trends of decline and stagnation. It is argued that revitalized unions are more likely to take part in broad social issues rather than pursuer narrow special interests. An example of this argument is found in Albert’s (2014) findings that revitalized unions actually take part in more hearings on broad social issues than they do hearings on core labor issues, in comparison to historic examples which showed inverse results.

A major critique of this school, however, can be found in the work of Burstein and Linton (2002), whose efforts in tabulating research showed that scholars tend only to prove the direct impact of organizations about 50% of the time. Some of their suggestions for why this could be the case include the systematic overestimation of organization effects and the use of organization resources rather than actions to measure influence. It is easy to see how these criticisms could be leveled at social interest research such as that of Radcliff and Saiz, whose measurements of union effects were focused on density. Nevertheless, scholars of this school would point to the consensus between qualitative analyses of political actions such as Albert’s tallies of union participation in hearings and quantitative analyses using union resources in defense of their methodologies. An additional criticism of this school lies in the contradiction between unions being a broad alliance of disenfranchised workers alongside the clear decline of union strength (Freeman & Murdoff, 1985). Scholars of the *social-interest* school would respond to this argument by pointing to the continued political influence of unions despite lower membership, especially in light of the revitalization strategies.

Despite these criticisms, the *social-interest* school remains the most promising current of thought for future research for a number of reasons, not the least because of the limited amount

of literature on it. Its ability to describe the recent revitalization actions of unions as well as demonstrated union influences on broad public policy matters are also strong points in its favor. In contrast the *pluralist* school is limited as a result of its conception of unions as serving the primary purpose of achieving special benefits, especially when considered alongside literature that suggests their inability to truly protect their monopoly powers. The *Democratic coalition* school is similarly limited in that it restricts the union world of political action within the party system, causing it to have inadequate responses to findings of independent union effects.

Theory

At its base, the *social-interest* school asserts that unions use their political influence to attain broad social goals. Unions that are acting in this way would therefore be expected to increase public spending in a variety of areas, including those where union members did not directly benefit. As actors pursuing these social goals, they would also be expected to have an independent effect when accounting for other institutions. Finally, unions from this perspective would be expected to their influence evenly to achieve desired amounts of public goods. These conclusions lead to the following three hypotheses:

H₁. If there is an increase in union strength in a state, then there will be an increase in the amount of social wealth that goes into various areas of public spending in that state.

The scholarship of the *social-interest school* places its foundation upon the assumption that unions will influence public policy towards the social interest. Previous researchers have supported this assumption with a mix of quantitative and qualitative findings which have tied union strength and involvement with public spending and policy liberalism. This hypothesis is meant to test this underlying assumption across a broader number of expenditures. It is expected that the greater strength that unions have in a state, the more that state will be influenced to allocate wealth to social expenditures. This result would be consistent with previous findings of the relationship between unions and spending, including those of the *pluralist* school, and would be the natural result of unions whose political influence is directed towards social rather than exclusive ends. While this model relies on the assumption that unions will use additional resources if available, previous findings of significance using similar conceptions of union strength suggest that this assumption is not unfounded.

H₂. If there is an increase in union strength in a state, then there will be an independent marginal effect on the amount of social wealth going into public spending even when accounting for the influence of the Democratic Party.

This second hypothesis is in response to the *Democratic coalition* school's suggestions that if unions are to affect public policy, they will have to do so through their symbiotic relationship with the Democratic Party. While scholarship in the *social-interest* school has yet to demonstrate a completely independent union effect across several types of public expenditures, there have been findings which distinguished between the two. With these findings in mind, it is expected that unions will have statistically significant effects even after the full

influence of the Democratic Party has been accounted for. This marginal effect would be the clear result of unions exerting independent political influence to expand public spending.

H₃. If there is an increase in union strength, then there will be a proportional increase in all areas of public expenditure.

Thus far scholars in the *pluralist* school have been able to explain possible union effects as a natural result of unions maintaining coalitions to secure their interests. Such a conclusion is in direct contention with the *social-interest* argument that unions have instead act on a broader social stance. The function of this hypothesis is to resolve this disagreement. The thought is that if unions are merely contributing to other social causes in return for future support, any influence that they have over less beneficial expenditures would be smaller than over areas from which unions directly benefit. Why, after all, would unions (when conceived of as special interest groups) bother expending their influence if they did not receive more in return than they could accomplish on their own? It is instead expected unions will have a relatively uniform effect on social expenditures; if unions are acting primarily on behalf of broad social objectives instead of narrow special interests, they have little reason to prioritize one area over another.

Method

The data in this study pertained to all fifty states and Washington D.C. and was taken from a variety of primary sources. Regarding the dependent variables, the US Census Bureau was used exclusively with the Public Education Finances Report being used to find per-pupil education expenditures and the State & Local Finances Report being used to extract spending on the following areas: public welfare, hospitals, highways, housing and community development, and unemployment compensation. These areas were selected to provide types of expenditures where union members could conceivably receive a direct and exclusive benefit in the form of wages or jobs (education, hospitals, health), a strategic benefit when bargaining with employers (unemployment compensation), or a social, non-exclusive benefit in the form of public goods (public welfare, highways, and housing and community development). Analyzing the effects of union strength across these different areas would provide a clear picture of what, if anything, unions prioritized when influencing social spending. Furthermore, it was decided to analyze the combination of state and local expenditures rather than just one or the other to capture the total possible influence of unions within a state.

After being collected, the different areas were then converted to 2009 dollars in order to match the gross state product (GSP) data taken from the Bureau of Economic Analysis (BEA). The areas of expenditure were then divided by the GSP of each state and multiplied by one-hundred, yielding a percentage which is hereafter referred to as the "amount of social wealth" allocated in a state. This transformation was necessary to present expenditures in terms of relative social spending. Previously chosen methods that examine proportions of public spending such as that used by Marlow and Orzechowski (1996) treat public spending as if 10% of the budget of a rich, fiscally

conservative state is equivalent to 10% of the budget of a poor state with expansive social programs. What is instructive when looking at relative social expenditures is therefore less the proportion of a state budget and more the average wealth per person which is going towards social expenditures.

In terms of the explanatory variables, the Bureau of Labor Statistics was used to derive data on union density (DENSITY) and unemployment (UNEM); furthermore, an indicator variable for the presence of right to work laws (RTW with 1 coded as the presence of such a law) was derived from the National Conference of State Legislatures website. Together union density and unemployment were conceived of as union strength. As discussed earlier, there has been some criticism of looking at the effects of social groups using only their available resources (Paul & Linton, 2002); however, union density remains a descriptive proxy variable for union strength in a given state as membership inevitably provides a limiting factor on the ability of unions to influence politics either through mobilization or spending. Similarly, right to work laws capture unions' ability to draw strength from non-members and as such provides a picture of the rest of unions' available resources in a state.² Unemployment was included to control for the impact of outside economic effects on expenditures.

As mentioned, GSP per capita data (GSP) was taken from the BEA. Its inclusion controlled for a natural increase or decline in proportional social spending as relative wealth increased. Control of state legislatures was derived from the Nation Conference of State Legislatures, which detailed which party controlled the upper house, lower house, and governorship of each state in each year. This data has been coded into an indicator variable (DEM) where 1 shows that the Democratic Party had control over both houses and the governorship and 0 shows that they had lost control of at least one house or the governorship. This method was decided upon from a small pool of alternatives³ through a series of preliminary regressions which showed the chosen coding to have the greatest explanatory power; it was selected in this way as its main purpose was to isolate the independent influence of unions, and the measurement with the highest explanatory power would do the best job of doing so. Additionally, an interaction between union density and this indicator variable was included in order to see whether union strength and Democratic control had complementary effects; it was necessary for the analysis of the second hypothesis that such codependent effects be separated from independent influence.

In order to avoid potential autocorrelation problems with the use of panel data, a time variable was also included. Finally, an indicator variable was included for before and after the 2008

recession (REC). It was included after some early graphical analyses showed that the influence of union strength may have changed whenever expenditures started to fall in real terms rather than increase as they had in the preceding period. An interaction effect between this variable and union density was also included in the event that the recession changed the slope as well as the intercept of the relationship.

To test for a relationship between unions and public expenditures, a series of OLS regressions were run on the mentioned areas of public spending. The explanatory variables of union density, right to work laws, the interaction between the two, unemployment, Democratic control, the time variable, the recession indicator, the two interaction terms, and GSP were used to explain the variability of state public expenditures. The estimated coefficients for the marginal effects of union strength and their significance were intended to make it clear how unions are using their influence and whether this influence is independent of the Democratic Party.

The final hypothesis was tested using a number of pairwise comparisons; these analyses were intended to compare the relative effect of unions across different types of expenditures. It was decided to use pairwise comparisons rather than a single group comparison in order to see where union influence was different if it existed. To accomplish this, the social wealth percentages created earlier were standardized in order to represent proportional effects of union strength. The data for one type of expenditure was then appended to the end of the data for spending of another type. Following this, the independent variables that were used in the main regressions were copied for both data series. An indicator variable was subsequently created, which served the purpose of denoting which data represented which expenditures. Finally, an interaction term between union density and this indicator was included. The significance and sign of this interaction would show whether there was a significant difference in the affect that unions had on each area.

Results

The results of the regressions on the seven different areas of public expenditures are shown in Table 1.⁴ All of the regressions themselves were statistically significant, although the model underperformed when explaining health expenditures. For every regression at least one and often two of the components of union strength were significant, and in all cases unions displayed a positive influence on public expenditures, confirming the predictions of the first hypothesis. Furthermore, they do so in the presence of Democratic control variables affirming the basic precept of the second hypothesis that union strength has an

their presence was not driving the relationships found. As such, they have remained in the model so that results apply to all states plus Washington D.C. Graphical examinations of assumed normality and equal variance otherwise showed no signs of major concern for most models. White's general test confirmed some heteroskedasticity in areas of expenditure such as highways. No transformation was undertaken so that coefficients could still be easily compared.

² While these two variables add some collinearity to the model (VIF = 1.9) and their interaction term even more so, they are descriptive enough that the inclusion of both is warranted.

³ These include coding 1 as the Democrats either holding both houses or holding the governorship, adding split legislatures to the coding of 1, and lagged values of each measurement.

⁴ There were a few states that exhibited consistently high studentized residuals, but auxiliary regressions showed that

independent influence. In the instances that the interaction between union density and right to works laws was significant, it can be seen that the presence of a right to work law at the very least nullifies union influence (as in the case of education) and in most cases reverses the influence of union density. One possible reason for this is that the multicollinearity between the RTW variable and its interaction variable resulted in the latter subsuming all of the influence of such a law beyond its direct impact on union strength. Another possible explanation is that in states without right to work laws unions have had a cumulative effect on public expenditures that dissipates in states that have such legislation.

Also, interesting are the cases in which the RTW variable displays an explanatory power either equally strong or stronger than union density. In the instance of unemployment, the variable has the predicted effect of reducing public spending as a result of decreasing union strength (that unions only appear to influence unemployment spending in interaction with

Democratic control here can be explained as there being a relatively inflexible floor on unemployment spending that only Democratic legislatures are willing to raise, and only when under pressure from unions to do so). The sign of the effects on housing and hospitals seems peculiar. However, why would union density and the presence of a right to work law increase public spending, but the interaction between the two result in union density having a net contractionary effect on public spending? A possible explanation that remedies this anomaly with the rest of the results is that in the absence of union effects there is a disproportionate amount of spending on hospital construction and development. As union density increases in a right to work state, public expenditures are spread more evenly resulting in a negative coefficient on the interaction variable. Such an explanation would be in line with the first hypothesis, with union strength having a positive although more even influence on expenditures.

Table 1. OLS estimations of state and local public expenditures.

	Per Pupil Spending	Public Spending as a Percentage of GSP					
	Education	Public Welfare	Hospital	Health	Highways	Housing and Community	Unemployment
Constant	24.3505*	3.0992*	0.1236	0.4699*	1.5446*	0.0220	0.1394*
	24.36	14.51	0.76	8.47	11.74	0.48	3.34
DENSITY	0.2438*	0.0435*	0.0198**	0.0073**	0.0278*	0.0128*	0.0019
	4.28	3.58	2.14	2.30	3.71	4.94	0.81
RTW	-0.7722	0.06	0.8668*	0.0168	0.0453	0.1575*	-0.1106*
	-0.89	0.32	6.16	0.35	0.40	4.01	-3.07
DENSITY*	-0.2423*	-0.0775*	-0.0251***	-0.0101**	0.0026	-0.0217*	0.0045
RTW	-2.71	-4.06	-1.73	-2.04	0.22	-5.34	1.20
GSP	-0.00013*	-0.000017*	-0.000006*	-0.000001*	-0.000006*	0.000002*	-0.000003*
	-15.79	-10.07	-4.40	-3.01	-5.52	4.11	-7.67
DEM	3.1602*	1.2953*	0.3230**	-0.0035	0.3692*	0.1978*	-0.0389
	3.98	7.64	2.50	-0.08	3.53	5.48	-1.17
UNEM	0.0637	0.0381**	0.0747*	0.01101**	-0.0556	0.0059***	0.0800*
	0.83	2.31	5.94	2.57	-5.48	1.70	24.84
REC	-1.447***	0.1561	0.0015	-0.0182	0.0173	-0.0128	0.3192*
	-1.69	0.85	0.01	-0.38	0.15	-0.33	8.92
DENSITY*	-0.2185*	-0.0979*	-0.0239**	-0.0031	-0.0494*	-0.0129*	0.0047*
DEM	-3.64	-7.65	-2.44	-0.92	-6.25	-4.76	1.88
DENSITY*	0.0732	-0.0058	-0.0122	-0.0025	0.0048	0.0020	0.0094*
REC	1.33	-0.49	-1.36	-0.81	0.67	0.80	4.08
TIME	0.2827*	0.0465**	0.0213	0.0055	0.0125	0.0016	-0.0493*
	3.05	2.35	1.41	1.08	1.02	0.38	-12.75
R ²	0.403	0.308	0.31	0.064	0.196	0.182	0.751
SE	3.4567	0.7384	0.5632	0.1918	0.4551	0.1573	0.1443
F	38.82*	25.89*	26.15*	4.84*	14.64*	13.42*	169.83*
n	561	561	561	561	561	561	561

t-statistics below estimated coefficients

*, **, and *** show significant at the 1, 5, and 10% levels or greater.

Table 2. OLS estimations of differences between standardized union effects.

	Education	Public Welfare	Hospital	Health	Highways	Housing and Community
Public Welfare	0.0047 0.36	N/A				
Hospital	0.1811* 13.3	0.1765* 12.95	N/A			
Health	0.0307** 2.15	0.0261*** 1.778	-0.1503* -10.27	N/A		
Highways	0.1071* 7.69	0.1025* 7.19	-0.0739* -5.08	0.0764* 5.03	N/A	
Housing and Community	0.0051 0.36	0.0005 0.04	-0.1759* -12.2	-0.0256*** -1.68	-0.102 0.02	N/A
Unemployment	0.0299** 2.43	0.0252** 2.02	-0.1512* -11.9	-0.0009 -0.07	-0.0773* -5.42	0.0247** 1.84

Columns coded as 0, rows as 1.

t statistics below estimated coefficients

*, **, and *** show significant at the 1, 5, and 10% levels or greater.

A final interesting finding to note in Table 1 is that the interaction between Democratic control and union density (except in the area of unemployment) has a negative sign when it is significant. This provides a nuanced view of the second hypothesis, as it suggests that unions only have a separate, net additive effect on three areas. In the presence of a Democratic legislature the previous independent effects of unions become mired with the effects of the Democratic Party, in a way similar to that predicted by the *Democratic Coalition* school of thought.

The results of comparing different union effects can be seen in Table 2. That multiple differences between proportional union effects are statistically significant provides evidence against the final hypothesis that unions would spread their influence evenly across areas of expenditure. What is interesting is that the analyses show that unions are more efficient at affecting some areas conceived of as providing non-exclusive benefits such as highway construction than they are at influencing areas providing exclusive benefits like education or health. This result seems to rebuke both the *social-interest* view of broadly interested unions as well as the *pluralist* view of narrowly self-interested unions. A possible explanation for this is that the amount of influence necessary to change different areas of public spending varies, making the standardized effect of general union strength a poor measure of how much union influence is being applied. Future research along these lines will be needed to come to a conclusive answer.

Conclusions

Historic trends in union decline only seem to be continuing, making an understanding of what their absence will entail even more important. Thus, this paper asked the question of how union strength affected state and local public expenditures. A series of regressions were run to test whether unions had a positive impact, whether this impact was independent of Democratic Party control, and whether union influence was even across areas. The data lends nuanced support to the first two hypotheses. In general union strength increased public expenditures as *social-interest* scholars predicted, but in doing so evenly it results in situations such as that of hospital spending in a right to work state; in such a situation increased union density causes disproportionate hospital spending to fall to the level of other areas of spending rather than simply increasing it. Similarly, union strength demonstrated an expected independent effect on public spending in the absence of a fully Democratic state government, but in almost all cases the independent influence of unions gets mired into Democratic influence when that party controls state government. The third hypothesis lead to a peculiar conclusion when union effects were not equal across areas, but the hierarchy of efficacy in influencing expenditures placed non-exclusive areas as the most prioritized. The likely explanation for this result is that general union effects were a poor model for how unions were using their influence proportionately.

Future research on this subject may wish to take the analysis a step further and investigate where this spending was focused on in the studied areas. For example, goals of future analyses

should explore questions such as does increased expenditure on highways result in better wages and safety precautions, more and better maintained highways, or both, for example. It might also be helpful to take the advice of Burstein and Linton and more explicitly attempt to look at union actions and motivations to better understand their influence as well as how much is being placed towards certain ends.

In conclusion, it can be seen that union strength has a generally positive effect on public expenditures, this effect exists both independently of Democratic control and alongside it, and that unions do not seem to have a proportionate influence on all areas of expenditure. Thus, the historic trend of union decline that this paper opened with is likely to result in a lesser amount of the social wealth of states going into public expenditures. This effect is open to be valued subjectively, but it is an important factor to keep in mind when deciding the fate of unions.

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Collegiate Athletic Fans Perception of the Use of Social Media in Marketing

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Abstract: *Social media has become the dominant tool for sports fans to receive news and messages. Many sports fans turn to the four main social media platforms, Facebook, Twitter, Instagram, and Snapchat, to receive marketing information, highlights, updates, and statistics while consuming sports content. Past studies indicated the greatest advantages for all levels of sports organizations using social media to promote the events and engage their fans. To fully understand the utilization of social media and its effectiveness for marketing intercollegiate athletic events, this study examined 203 athletic spectators' (62% males and 38% females) preferable methods for obtaining athletic information and promotional message at a regional institution in Appalachia. The results showed the respondents relied on social media and word-of-mouth far more than the official athletic website to obtain information and game content. It was found that students' preferable communication channels and pattern of use were different from the older community fans as compared to the past studies. Practical strategies for increasing certain types of video content and messages to enhance student event attendance and engagement were addressed based on the analyses of this data. The athletic department could also create additional employment or internship positions to mainly produce and monitor promotional and informational content in social media platforms.*

Keywords: *Collegiate Athletic, Fans Perception, Social Media, Marketing*

Over the last seven years, social media has become the dominant tool for people to receive news and communication messages (Holmes, 2015). Nowadays, sport fans also turn to the four main social media platforms, Facebook, Twitter, Instagram and Snapchat, to receive marketing information, highlights, updates, and statistics while consuming sport contents. Numerous studies identified the great advantages for all levels of sport organizations using social media to promote their events and engage their fans (Abeza, & O'Reilly, 2014; Lebel, & Danylchuk, 2014; Ourand & Fisher, 2013; Steinbach, 2010; William, & Chinn, 2010; Witkemper, Lim, & Waldburger, 2012). The decreasing attendance of college football, particularly the loss of student fans, was an alarming sign that administrators could not ignore (Bachman, 2018; Cohen, 2014; McKnight, 2017; Popke, 2018).

Many suggestions and comments could be found on how to make collegiate athletic events more family-oriented, festival-like and offer all sorts of discounts, entertainment, and giveaways to attract various types of fans and spectators (Brokaw, Stone, & Jones, 2006; Christiansen, Greene & Jones, 2019; Krohn, Clarke, Preston, McDonald, & Preston, 1998). However, the central element for achieving marketing schemes and activities to boost game attendance heavily depends on the

use of proper communication channels to reach the targeted audience. It was vital to perform a gap analysis to evaluate what the audience and students knew about the game information and actual attendance to athletic events (Latta & Mitchell, 2009). There were only limited studies examining marketing effort and communicative strategies related to regional and small collegiate athletic programs, particularly in the use of social media in sports marketing (Zullo, 2018) and how event attendance was influenced by social media marketing (Chen, 2019).

To fully understand the utilization of social media and its effectiveness for marketing intercollegiate athletic events, this study examined event spectators' preferable methods for obtaining athletic information and promotional messages from a regional collegiate athletic program in Appalachia. By knowing how social media and online platforms (such as the official athletic website) were utilized by fans to obtain athletic information and game contents, practical strategies for developing certain types of contents and messages can be developed to entice students for game attendance and engagement.

Impact and Benefits of Social Media Marketing

Evidently, social media has become the most prevalent and dominant promotional and communicative means among various

sport industries. All business sectors, including professional franchises, non-profit governing agencies, and educational institutions, are eager to reach out to their consumers via online social networks in the Internet marketing environment (Reuben, 2008; Thompson, Martin, Gee, & Eagleman, 2014). Sports fans are huge users of social media (Haugh & Watkins, 2016). Indeed, it was estimated 95% of them use it in a typical day versus 86% of non-fans (Editorial, 2009; Haugh & Watkins, 2016). The Bowl Championship Series (BCS) received harsh criticism from football fans when it only created news and messages on its official websites without any other social media presence (Clapp, 2015). This clearly reflected the committee's slow pace and reluctance to embrace creative ideas and technology. Research has indicated that more collegiate athletics changed their communication strategies and shared information via internets and apps (Clavio, & Walsh, 2014; Mayo, 2017; Witkemper, Lim, & Waldburger, 2012). More fans turn to their Twitter accounts every week to learn about the location and the opponents their favorite team is playing. College sport programs turn to social media quickly because most, if not all, the students have some sort of social media platforms. Even the older community fans have gradually adapted to the use of social media for retrieving information.

Social media became the favorable channel to reach all the fans due to its numerous advantages and benefits. It is economical and extremely fast in reaching a multitude of people (Fetchko, Roy, & Clow, 2019). Sports marketers understood the importance of sharing the complex dynamics and unique culture within the arena and various consumers among different geographic regions (Kwon & Trail, 2001). No other means can help spread the news, educate the fans, and cultivate the entertainment culture like social media does (Reuben, 2008). It also helps reach the massive international fans in a quick fashion and sports marketers would utilize social media to learn about what their fans crave and enjoy (Engleman, 2013). Major League Baseball teams, such as the Boston Red Sox, use social media to collect research data and fans' feedback to improve the event services or moving schedule due to rain delay (Clapp, 2015). Instant Twitter polls are a standard tactic to recognize the fans' thoughts during the rain delays. From the economic perspective, the athletic department can now save a significant amount of hassle and cost by not passing out or mailing out flyers and newsletters to people (Mullins, Hardy, & Sutton, 2014).

Social media also influences sports fans' decision in buying products or services from sports sponsors (Editorial, 2009). Contents such as discounts, product or service reviews, advertisements, and athlete endorsements frequently appear in social media to attract sport fans' attention. Some entities, such as collegiate athletic programs even aggressively sold event tickets on the social media platforms (Steinbach, 2010). Marketers of sports teams and organizations believe social media is an effective tool to build their brand. Star athletes are the greatest brand advocates available. Consumers and fans are interested in discussing the athletes' performance, fitness, and sport expertise, along with the athletes' personal stories (Kleps, 2017; Lebel & Danylichuk; 2014; Walsh, Clavio, Lovell, &

Blaszka, 2013). Based on these concepts, many of hashtags have been created to promote the brands, products, and athletes. Social media certainly helps maximize the social interaction between the sport leagues and their fans (Pardee, 2012). Therefore, administrators, and managers cannot overlook the value of training their players and must actively engage with the organizations' own social media presence and feed them back to central team pages (Clapp, 2015)

Social Media Trends in Collegiate Athletics

Studies revealed that collegiate sports spectators gradually learned about sporting events through the institution's social media pages, such as Facebook, Twitter, Instagram and Snapchat (Clapp, 2015; Mayo, 2017; Mullins, Hardy, & Sutton, 2014; Reuben, 2008). Traditionally, athletic administrators were concerned about the negative impact of student-athletes' inappropriate social media presence (Clavio, 2011). However, more sports teams now are encouraging their athletes to engage in social media for building the team's brand or advocating social changes through creation of hashtags (Kleps, 2017; Mickle, 2013; Thomas, 2016; William & Chinn, 2010). Social media is indeed a favorite strategic choice for managing and executing relationship-marketing (Abeza & O'Reilly, 2014; William & Chinn, 2010). When student-athletes shared their athletic-related performance, volunteer experiences, and personal stories with sports fans on social and locational media, this demonstrated their passion and caring for the community (Clavio & Frederick, 2014). In today's dynamic marketing environment, it is not merely enough to passively wait for the consumers to react to the information and messages displayed on the websites (Suh, Ahn, & Pedersen, 2014). Despite the popularity of social media as a marketing tool, Clavio and Walsh (2014) stated that there were still a lot of college fans who were relatively slow in adapting to this communication channel. Even at a Power-5 conference institution, fans of Indiana still used newspapers and official websites as the dominant sources for obtaining athletic information. Furthermore, there were still less than 30% of fans following the official athletic Twitter feeds and Facebook websites.

The researchers made an attempt to investigate the pattern of use of social media by the institution's athletic event spectators in 2019 (Chen, Gdovka, & Hall, 2019). In that particular study, there were 180 respondents in the surveyed sample with community fans ($n = 86$) and students ($n = 50$) as the two largest demographic groups. Most respondents found out about the athletic information through social media (83%) and the official athletic website (MSUEageles.com; 71%). The traditional methods for sharing game information such as word-of-mouth, radio, and newspaper/prints were less utilized (> 26%). The researchers suspected the more prevalent use of Facebook (72%) than Twitter (43%) was mainly due to a greater number of respondents (60%) in the age category of 45 or older.

Due to the scarcity of research investigating the utilization of social media among the fans of small collegiate athletic programs, the researchers intended to examine the preference and frequencies of the social media use by the event spectators of a regional collegiate athletic program in Appalachia. The

findings on utilization of social media and online platforms (such as the official athletic website) by existing spectators should guide marketers' development of effective promotional contents and messages to improve student game attendance and engagement.

Method

Participants

The participants of this study included 203 adults (108 males, 93 females, and 2 unmarked) who were either students at a regional university in Appalachia (70%) or the local residents who lived close to the campus region. The majority of them (89%) were in the age category of 18-24 years old. Individuals who were not categorized as students were either identified as community fans (24.1%) or members affiliated with the institution (alumni or employees; 5.5%). Because the focus of this study was to address the use of social media as a marketing and communicative tool for a regional collegiate athletic program and its impact on student attendance, the researchers purposefully targeted students as the primary participants.

Instrumentation and Procedure

The researcher created a 20-item survey based on the work of Clavio and Walsh (2014) in order to identify how participants had learned about the sporting events on campus, along with their consumption pattern of sports information. The content of this self-created questionnaire generally covered areas such as: (1) methods for receiving athletic information, (2) event attending preferences, (3) event viewing patterns, (4) behaviors on the use of digital platforms, and (5) demographics. This was the second time the survey had been administered at this specific institution. In the previous study, the researchers performed a test-retest analysis on the instrument and received a strong correlation on responses ($r > .850$) from a sample group of 35 sport management students (Chen, Gdovka, & Hall, 2019).

The participants were recruited and invited to participate in the survey by two methods. With the support of Greek life and Student Government Association, the researchers met with the students and adult fans who attended two basketball home games during the 2019-20 season. The researchers' original intention was to collect 120 copies of responses from a large convenient sample. Later, more surveys were distributed to individual students who were approached by the researchers in hallways, student union, cafeteria, and library. After agreeing to fill out the survey, participants either submitted their responses via online or paper-based version. The data collection period lasted from early February to early April of 2019. Before the participants filled out the survey, the researchers explained the purpose of our study to them. They could decide to respond voluntarily or refuse to respond. Although no prize (or incentive) and coercion were involved, they still agreed to help the researcher with the research by completing the survey.

Results

Based on the participants' responses, men's basketball (74%) and football (63%) were two most popular and attended sports sponsored by the institution. The next two popular sports were both female sports, volleyball and women's basketball, with 43% and 29% of participants attending the events, respectively. Nearly 45.3% of the participants had attended more than six games annually. In general, participants mainly relied on word-of-mouth (77.8%) and social media (77.3%) to receive game information. Only about 22% of participants would obtain the information through multiple platforms to remind themselves about the games. The official athletic website (MSUEagles.com) was utilized by 16.7% of participants. Traditional media such as newspaper (12.3%) and radio broadcasting (7.9%) were far less depended on.

Although participants were likely to browse the official website for game information and contents, only 33% of them were considered as frequent users. Nearly 67% of the users occasionally or rarely visited the site. On the contrary, they visited athletic-affiliated social media platforms more often than the official website. Instagram (43.3%) and Twitter (38.95) were two most prevalent platforms followed by the participants. About 24.1% of the respondents also visited YouTube to retrieve highlights and results. Approximately, 13.8% and 33% of participants would follow the athletic events through radiobroadcasting or live streaming (i.e., OVC Digital Network or ESPN 3).

Overall, 21% of respondents were truly satisfied with the content received from the social media. Regarding how social media contents should be improved, 37.9% of participants indicated no change was needed. About 48.3% of respondents expected to read more posts, and 16.7% of individuals would like to read more personal stories related to student-athletes.

The primary participants of this study were college-aged young adults in the 18-24 age category. The researcher found dramatic differences in results between this study and our previous study. In the previous sample, comprised of 72.2% community fans, alumni and university staff, older respondents indicated the official athletic website was relied on as a main tool to obtain information and game content as much as social media. Older community fans relied less on word-of-mouth for game information. Overall, newspaper and radio broadcasting were found to be less utilized for obtaining game information within both groups.

In this study, the researchers also discovered that Facebook was not as popularly followed when compared to the previous study sample (Chen, Gdovka, Hall, 2019). The young participants tended to utilize Instagram (43.3%) and Twitter (38.9%) to discuss and follow the athletic news and information far more often than Facebook (15.8%). This finding was completely opposite for the older fans in terms of preferable social media platform. A similar result was also found by Clavio and Walsh's (2014) in which the researchers concluded that when trying to communicate with students via social media, messages and approaches needed to be presented in different fashions, as well as the choice of platform.

Discussion

Many marketing textbooks indicate that traditional media such as newspapers and radio still play an important role in promoting collegiate athletics (Mullins et al, 2014). The reality is that demographics of college sports fan base is still dominated by individuals over 40 years old (Johnson, 2017; Notte, 2017). However, the results had guided us to use social media platforms such as Twitter, Facebook and Instagram as communication tools to reach out to students effectively. Among the Southeastern Conference schools, Twitter and Facebook had proven to be powerful and popular communication platforms particularly in prompting women's basketball teams' stories and game information (Chen, Duncan, Street, & Hesterburg, 2016). It is believed that the popularity and pervasiveness of Instagram use will also rise drastically in the near future.

The researchers observed a unique phenomenon based on the findings. As Gwinner and colleagues had stated (2003), word-of-mouth behaviors remained as a critical method for college students to learn/hear about the sporting events. The researchers recognized this phenomenon was a simple and direct reflection of human behavior. Students who lived in the campus community and conducted a lot of studies and social activities together would naturally share the news and invite each other to attend the sporting events. In fact, this is the essence of what social media is all about. Different forms of social media apps are literally just tools. The actual important function of social interaction and caring is about people physically sharing their desire and thoughts with others through their actions (i.e., talking, posting, and tweeting).

The researchers assumed the institutions' athletic program had come to the crossroad to face the new-and-old dilemma. Although displaying game information and promotions in newspapers, print-materials and on radio broadcasting were viewed as the standard ways to communicate, these methods had obvious limitations in terms of frequencies of showing and visibility. On the contrary, social media is a faster tool to reach a multitude of audiences with no time restriction for sharing the information and little amount of cost. More important, it is probably the most receptive way for the athletic program to communicate with the students. Traditionally, student fans had been neglected by the athletic departments because they were not the primary demographics who paid a lot of money for tickets, parking, and concession items. The financial-driven business practice probably made most athletic departments focus on the needs of alumni, donors, sponsors and community fans; thus, far less effort was done to promote the games to the students which led to the decrease of student attendance.

In addition to the use of Facebook and Twitter, many lucrative and prominent Division-I athletic programs incorporate streaming and video-highlights for their fans to access if they cannot physically attend the game. The streaming feature can be included in either a social media platform, such as Facebook, YouTube and Instagram or through ESPN+ or the streaming network. At this moment, the researcher's institution had less than 33% of fans utilizing streaming feature at all. We hope more practical strategies for developing video contents and messages

to enhance student event attendance and engagement can be developed and implemented.

Implications and Recommendations

As the scholars stated, the future is online (Clavio, 2013). Indeed, the majority of individuals have a computer, smart phone, or tablet. Even older fans still may follow many different platforms of social media. The importance of engaging fans of all age groups in multiple platforms, improving interactive capabilities and improvising more video and streaming contents through apps are keys to successfully grow college sports fan bases. Now is a critical time for athletic departments to fully adapt to new communication technology and gradually shift marketing efforts from the traditional media to social media.

Based on the results of this study, it is this author's suggestion that athletic programs create employment or internship positions to further generate and monitor promotional and informational content in social media platforms. This suggestion does not necessarily mean athletic programs completely abandon any advertisement in newspapers or on radio broadcasting; it is more about shifting the focus and encouraging all different types of fans to follow the athletic information and messages through multiple forms of media. It is suggested that those hired individuals work on increasing the volume of shared messages and contents on the social media sites. It is also important to improve the interactive features of various sources of platforms related to athletic contents and information. The bottom line is to have an inclusive official website that connects to all different social media platforms. Additionally, It is also important to have a social media site for each individual sport team that is affiliated with the athletic program. All the individual sports team information might do well if it were linked back to the official website and central social media hub. If this demand is still a tall order to fulfill, then at least popular teams such as football, men's and women's basketball, and volleyball should have their own social media accounts. Fans may follow their favorite team by entering the individual team's social media site. The central athletic account can harbor key event information and advertisements (especially the discounts and game-day promotions) so that followers will not be bombarded with numerous similar messages or too much information that cause them to be overwhelmed.

In terms of future investigations, researchers should expand the use of line polling to gather valuable information for improving existing services and generating discussions. This study helped the athletic program to recognize the main channels for communicating with the students. It would be beneficial to conduct future studies on the analyses of posts and contents in social media platforms, which help the program track down the volume of shared information related to event promotions. Merely witnessing how the posted stories and messages have changed the program's image is not enough. It is vital to investigate how the shared promotional messages and advertisements directly correlated to the increase of attendance and sales.

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PAPER GUIDELINES

The manuscripts must be typed fully, double-spaced and in 12-point font, including references, captions, footnotes and figure legends (Tables must include at least 10-point font). Manuscripts must be in Word format. Page margins on all sides must be at least 1 inch wide. All pages are to be numbered, and manuscripts should not exceed 7,000 words.

The authors should submit a “blind” manuscript, with their identifying information deleted from the submission. They should identify the contributors in a cover letter and in a separate title page.

Mentor Statement

All submissions must also be accompanied by a statement from the lead author’s mentor that the project was primarily created and completed by the student.

Formatting

All submissions are to be written in APA format, and they must follow the current formatting specifications of the American Psychological Association. More information can be found at <https://owl.english.purdue.edu/owl/resource/560/01/>.

Abstract and Pictorial Representation

All submissions must include an abstract of up to 150 words, and a pictorial representation of their work (e.g., picture of the methodology, graph, table, still photo of a performance).

Document Organization

Research manuscripts should include the following:

Title Page: This should include the title of the article, the names of all authors, the institutional affiliations.

Blind Title Page: This should only include the title of the article.

Abstract: This is a single paragraph composed of no more than 150 words. It briefly describes the entire article, including hypotheses, methods, results and conclusions.

Introduction: This section should provide an explanation for why the study is important, a review of the empirical literature on the topic, a rationale for the current study, and hypotheses or research questions.

Method: This section should describe the materials and procedure involved. It should be clear and thorough enough that a reader could replicate one’s methodology.

Results: This section should provide answers for one’s hypotheses or research questions, supported with evidence from an objective analysis. All tables and figures should be referred to here, but tables and figures should not be embedded in the text.

Discussion: This section should provide a thorough evaluation of how the results contribute to the field. Limitations of the current project and ideas for future applications should also be mentioned.

References: This section lists the references cited in the paper using APA format. They should be listed alphabetically by the first author's last name.

Tables and Figures (if applicable): If submitting tables, the format must be XLS or DOC. Each table (including the title, body and footnotes) must be double-spaced on a separate page from the text. Number tables consecutively as cited in the text. The title is a brief description of the table's content. The figure captions should be included on a separate page, after the tables and prior to the figures.

Appendices (if applicable): If the authors deem it necessary to include research materials in appendices, they should include them at the end of the paper, numbered in the order that they are referred to in the text.

Submissions in the Humanities, Creative Writing, Performance Arts and Exhibition Arts should follow the general structure common to their discipline, but all submissions must include an abstract describing the content of the submission.

Submission Process

1. Click the Submit Article link on the journal's main page
2. Read through the preliminary guidelines for submission, and click Continue
3. Read and accept the Article Submission Agreement
4. Provide information about yourself:
 1. Name
 2. Affiliation
 3. Address
5. Provide information about the authors of the submission:
 1. Email address
 2. Name
 3. Affiliation
6. Provide information about your project and upload it
 1. Title
 2. Short title
 3. Keywords (separated by commas)
 4. Discipline
 5. Journal Domain
 6. Abstract (150 words or less)
 7. Streaming Media file (for performing arts). Please use a YouTube or Vimeo file.
 8. The Full Text of Your Submission. Please use a Word file.
 9. Cover Letter. Please use a Word file.
 10. For Additional Files:
 1. Submit a pictorial representation of your project. This can be a graph of your results, a photo of your methodology, or a picture of your artwork
 2. The statement from your mentor indicating that the project was primarily created and completed by the lead author

Media Files

If submitting a performance piece (e.g., dance, theater), please create a YouTube or Vimeo link to upload into the submission system.

Review Process

Upon receipt of a submission, the executive editor will examine the content and completeness of the submission. The submission will then be sent to an associate editor, who will locate two faculty members to review the submission (faculty may supervise a graduate student or post doc reviewer). The reviewers will be given 30 days to evaluate the submission and send their responses to the associate editor. They will also indicate whether the submission should be accepted, rejected, or if the submission should be revised and resubmitted.

The associate editor will then upload their comments and the reviewer suggestions into the online journal system, where authors can review the comments.

For acceptance decisions: The authors will be asked to complete a copyright form and will be informed of which issue their work will be published.

For rejection decisions: The authors will not be allowed to revise and resubmit the work to this journal.

For revise/resubmit decisions: If authors decide to resubmit, they will have 30 days to complete the revision and resubmit. Authors should also create a response letter, detailing where in the revised submission those comments are addressed. The original reviewers will then be asked to review the revised submission within 30 days and either accept or reject the submission (see above).

Contact Information:

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