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PERPETUA

SPRING 2022
SPECIAL EDITION



THE UNIVERSITY OF
ALABAMA IN HUNTSVILLE

PERPETUA

SPRING 2022
SPECIAL EDITION

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LETTER FROM THE EDITOR

In 2015, the first edition of *Perpetua* was released, showcasing the amazing work of a group of undergraduate students at The University of Alabama in Huntsville. Since then, it has ebbed and flowed in many ways, with significant setbacks arising with the onset of the COVID-19 pandemic. As a university, we have been fortunate to gradually work on our reemergence, but the same was not true for *Perpetua*, our Journal for Undergraduate Research.

Until now, that is. *Perpetua* is Latin for "unceasing." Quite the appropriate name, though I can't imagine the inaugural student committee anticipated the many challenges we have overcome to sustain not only our journal, but our community at large.

It is a great honor to usher in a new *Perpetua* for the UAH community. With it, I must humbly commend the student researchers presented in this special edition. They have worked hard to get to this point, nearly a year after the earliest of their submissions, and I am pleased to present their peer-reviewed manuscripts as a testament to their will and persistence throughout what has been a very rough transition. We as an editing team extend our gratitude to them particularly, as well as the faculty members who have taken the time to review their work for this publication.

Thank you for taking the time to look through the research presented here. It is a small sampling of some of the astonishing work carried out by undergraduates here at UAH every day. We, as the editors of *Perpetua*, are delighted to share this and many more works in the years to come.

Charge on!

A handwritten signature in black ink, appearing to read "Eirian Waldron". The signature is fluid and cursive, with a long horizontal line extending from the end.

Eirian Waldron
Interim Editor-in-Chief

DEDICATION

*This special edition is dedicated to all the students, faculty, and staff at
The University of Alabama in Huntsville who have been involved in
research over the course of the COVID-19 pandemic.*

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Laughs and Giggles Take Center Stage: The Effect of Humor on Public Speaking Anxiety

Emetonjor, Ezeriki

Department of Communication Arts

Abstract

This study sought to explain the connection between self-reported public speaking anxiety level, humor use, and the effect that humor may have on public speaking anxiety levels during student's speeches. Existing studies theorize that humor may improve a speaker's disposition during their speech but are yet to empirically measure stress response. Humor in specific contexts, such as medical fields or business, has been shown to relax the audience, but it can backfire and make the speaker lose credibility. Our method relied on 120 undergraduate students who wore wrist-based, heart rate monitors during their speeches. Instances of humor were derived from the speeches using video recordings. We compared students' self-report stress level to the speaker's actual stress level during the live speech to see the impact of humor usage. Next, we looked at the speaker's sustained stress level during the time they were telling a funny story or joke. The results indicate that there might be a relationship between humor and public speaking anxiety, but the stress response was not different based on self-reported stress level. We provided examples of 8 participants, which all show instances in which there was a drop in RR levels during humor usage. This study gives empirical evidence for teachers and public speaking coaches on when to advise humor use in speeches. While humor can be rewarding, it appears to cause a heightened stress response due to a sense of vulnerability.

Keywords: public speaking anxiety, heart rate intervals, humor, stress relief theory, identification

1. Introduction

Many people dread the activity of speaking in public because of the anxiety or negative perceptions they associate with it. According to Bodie (2010), public speaking anxiety is specifically defined as a "subtype of communication-based anxiety whereby individuals experience physiological arousal, negative self-focused cognitions, and/or behavioral concomitants in response to an expected or actual presentation" (p. 71). Some of these effects of public speaking anxiety include higher heart rate, a fear of judgement from others or even physical manifestations, such as trembling. From this, we can see that public speaking anxiety plays a big role in our lives, particularly in areas where public speaking is relevant, such as in the workplace or in school, and so on.

Another major factor that is relevant to our lives is the presence of humor. Humor

can be defined as the "quality of being pleasant, sympathetic, amusing, or funny" (Reber 1995 in Bodie 2010). Humor exists in almost every period in our life, whether in good times or bad. In fact, humor, at times, can be used in stressful situations to diffuse the stress, as it helps one get into a positive mood, which in turn influences one's cognitive processes in a more desirable manner (Cann, Calhoun, & Nance, 2000). This makes humor a very interesting topic to study, to fully understand the extent to which it plays a role in our perception and interaction with the world.

In this paper, we will examine the interaction between humor and public speaking anxiety, particularly in terms of the effect that humor has on public speaking anxiety. We are interested in this interaction, as humor is a potential tool to mitigate the stress that comes with public speaking anxiety. The study involved observing and

recording 120 students as they delivered their graded speeches: introductory, special occasion, informative, and persuasive. The students wore wrist-based Rhythm+ heart rate monitors during their speeches to measure their heart rate variability, which will be referred to as RR in the rest of this paper. The recording of their speeches was then compared to their RR to identify what was happening in context as their RR level dropped, indicating a high stress moment (high RR indicates low stress while low RR indicates more stress). From those high stress moments, we observed a number of them that correlated with humor. In this paper, we will display some of those observations, in which an instance of humor was correlated with a drop in RR levels.

We will first start with some academic literature, which provides some background as to the relationship between humor and public speaking. We will then talk briefly about our methods and results from this study, as well as provide some ways in which we can move forward on this topic.

2. Literature Review

This literature review will begin by discussing the common definitions and theories for humor in public speaking. Next, it will address the social role of humor before surfacing existing research on humor and its effects in high stress situations.

Humor is highly dependent on the situation, speaker's position, and their relationship to the audience (McRoberts &

Larson-Casselton, 2006). Whether it is a formal joke, surprising anecdote, word play, wry observation, or self-deprecating remark, humor changes depending on cultural context and over time. As Meyer (2000) explains, "given a set of audiences or contexts, what would be perceived as quite humorous in one instance may seem irrelevant or only mildly interesting in another" (p. 316). Because humor also includes both nonverbal and verbal communication (Kanchanapoomi & Trakulkasemsuk, 2020), the speaker's identity matters. The speaker must use context, cultural knowledge, paralinguistic attributes (such as tone, pace of speaking, and volume), and nonverbal communication (such as facial expression, gestures, and posture), to create a humorous event. Some people are natural joke tellers, finding humorous content in any situation while others need very specific situations (Jalalkamali et al., 2018).

The audience must find something funny to complete the circle. According to one definition of humor, there must be a sense of surprise for audiences to "get" a joke, so the underlying content must be familiar to the audience yet not too familiar (Meyer, 2000).

Several studies have addressed the impact of humor in various situations. According to Romero and Cruthirds (2006), humor is a useful tool for managers and supervisors to reduce stress and tension in the workplace and improve their performance. Lee and Kleiner (2005) also found benefits for front line employees who

experienced less stress and anxiety when humor was part of the workplace. McRoberts and Larson-Casselton (2006) analyzed health care settings and found that humor allowed health care staff to manage negative emotions, like anger, fear, or embarrassment.

Existing empirical studies have not specifically looked at the effect of humor on the speaker. Benacka (2017) hypothesized that humor helps establish rapport with the audience: “Humor is a primary way to create a sort of backstage informality” (p. 39). It can also be used to “smooth over disruptions that may occur during a speech” (p. 39). Bronson and Alford (2004) point out that American adults fear public speaking more than any other event, in some cases more than death itself. They recommend that students reframe their fear of the public speaking situation as a funny situation where the audience may laugh along with them rather than at the speaker. Finally, there are some ideas about the role of humor in audience retention of information where humor improves interest in the content (Gruner, 1970).

RQ1) When a speaker uses humor, does the audience reaction change their stress response?

H1) High anxiety speakers will have a nervous response when attempting to use humor; Low anxiety speakers will be confident in their jokes and not have a nervous response.

3. Methods

Public speaking has long been a key skill taught to students around the world, many who experience public speaking anxiety, a type of communication apprehension (Bodie, 2010). To better understand public speaking anxiety empirically, 120 students were asked to wear a wrist-based Rhythm+ heart rate monitor as they delivered their graded speeches: introductory, special occasion, informative, and persuasive. The video recording of their speeches was then matched to their heart rate variability (high RR indicates less stress, low RR indicates more stress (Friedman & Thayer, 1998)) to identify what the speaker was experiencing in context. 2,547 high stress moments were captured and analyzed. Of those, 129 dealt directly with humor. This subset was retained to address our research question. The participant pool contained 80 men and 57 women. They were predominantly freshman and sophomores. The participant pool was also 72% white which matches UAH’s existing racial diversity.

4. Results

To understand the impact of humor on the speaker, we looked at all instances of joke usage and the RR values for each speaker to see if there is a difference between low, medium, and high PRCA-24 values. A spearman correlation showed there was not a significant relationship between stress from telling a joke and the joke tellers

self-reported anxiety level ($\rho(127) = -.127, p = .15$).

Next, several specific speakers serve as case studies for the stress reaction when using humor in their speech.

Illustrative Examples

Participant A: Participant had an instance of humor in the final RR drop at a value of 995. Participant A told a joke involving a funny story of a family member (grandpa who is always kayaking on Gunter'sville and would most likely be seen if anyone was passing by). Audience responded positively with most of the class laughing or giggling in response to the joke.

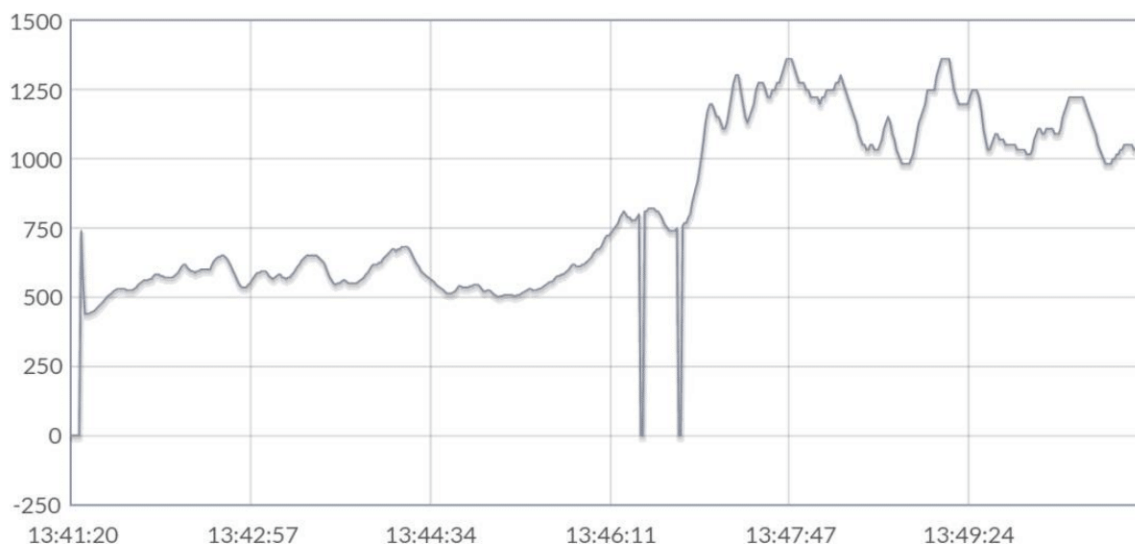


Image 1: Participant A RR chart.

Participant B: Participant B had very stable RR data with only three RR drops. The instance of humor occurred at the second RR drop with an RR value of 580. The participant was telling a humorous story of

the time when he and girlfriend were being robbed and how they escaped. There was minimal reaction from the audience with a few giggles here and there. Participant did laugh at his own funny story though.

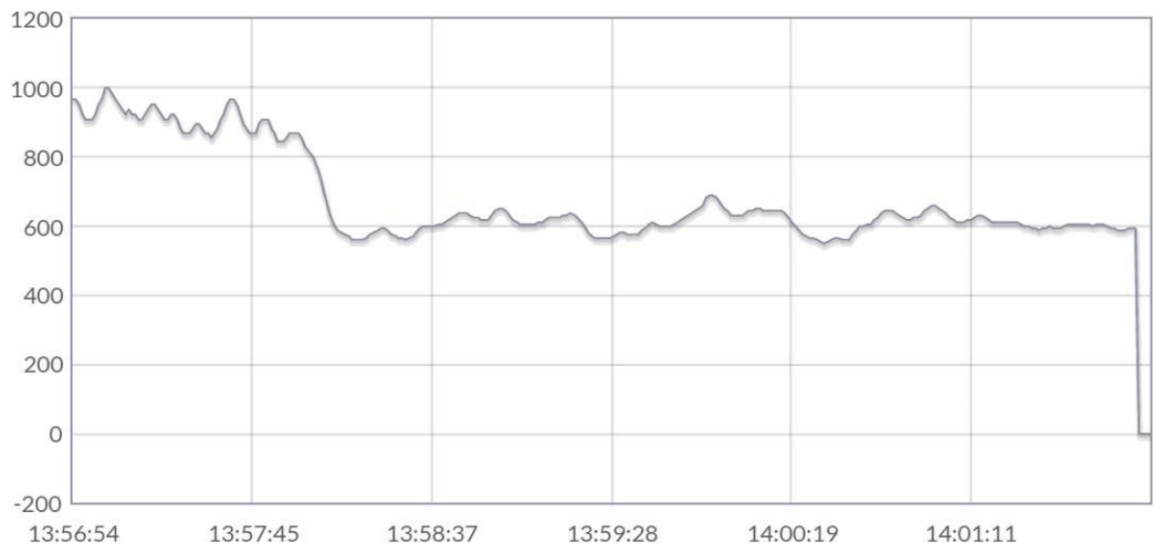


Image 2: Participant B RR chart.

Participant C: There were about two instances of humor in this speech. First instance occurred at the second RR drop at an RR value of 1150. The participant was telling a funny story, which was very specific to the hobby or activity of driving in which her boyfriend was a scary driver. The participant laughed slightly at the story, but

there was minimal to no response from the audience. Second instance occurred at the last RR drop at an RR value of 1160. The participant was concluding her speech and referenced the funny story of her boyfriend's scary driving again, in which she giggled slightly. Audience did not respond.

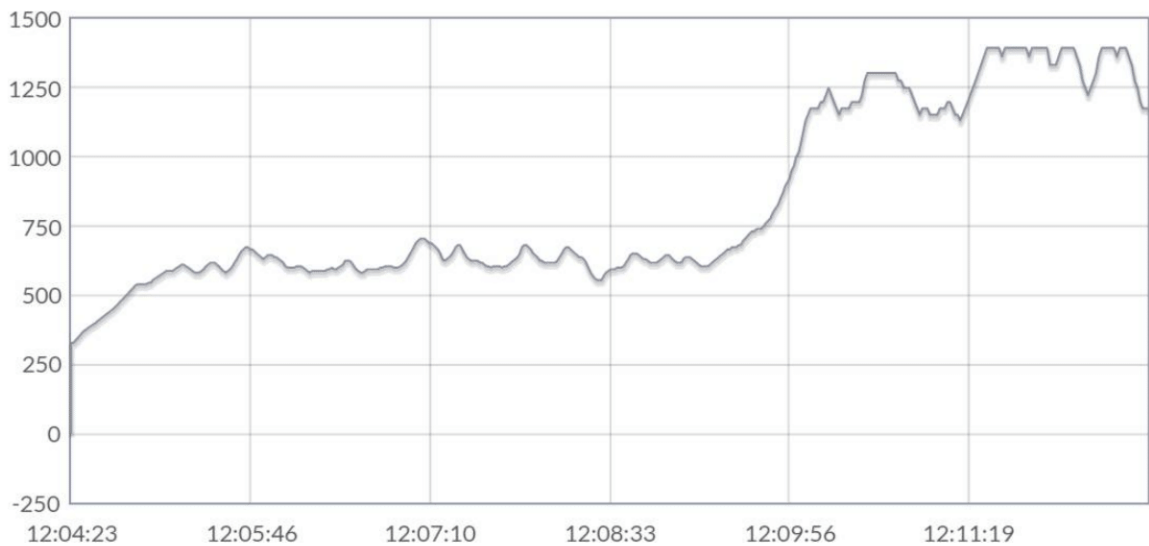


Image 3: Participant C RR chart.

Participant D: There were about two instances of humor. The first instance occurred at an RR value of 1050. The participant was in the middle of the speech in which the participant highlighted a fun aspect of his life, which involved missing school as a result of his avid participation in sports, such as basketball and soccer; he also

showcased to the class an obvious golf ball in a humorous way that elicited some laughs from the audience. The second instance occurred at an RR value of 900. It involved the participant explaining his medical condition, in which he got extremely dizzy between sitting and standing up, using a humorous statement.

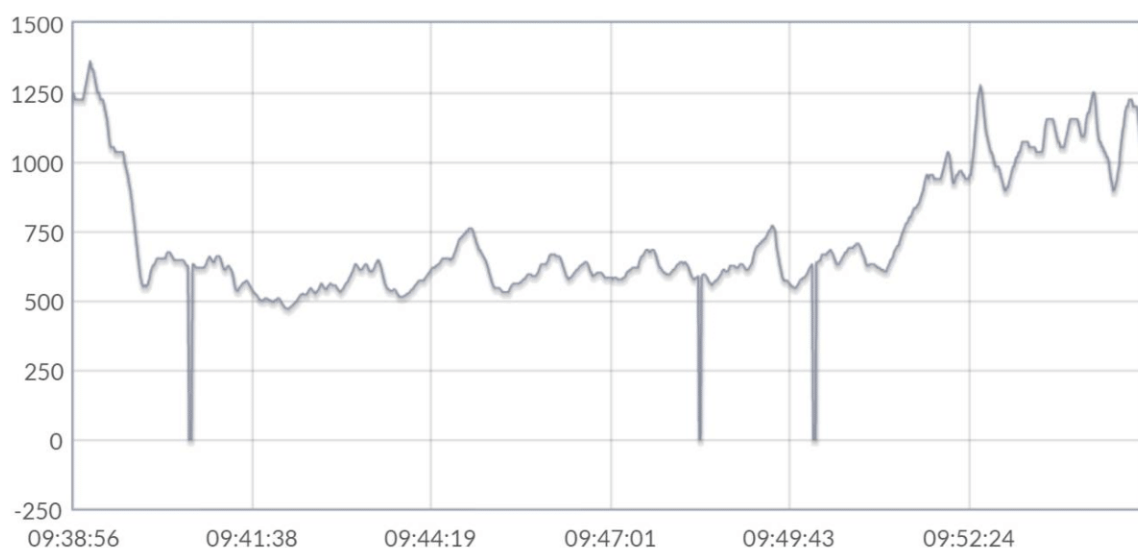


Image 4: Participant D RR Chart

Participant E: There are two instances of humor. The first instance occurred at an RR value of 550 and involved the participant narrating her experience in high school, in which students were rewarded with stickers for their academic performance; the participant made a funny comment in which instead of being the first to receive a sticker, she was the second, which she still seemed

bothered by but brushed off. The audience laughed in response. The second instance occurred at an RR value of 540 and involved the participant narrating a past ordeal, in which her class had lost a classmate and how her teacher had helped them all through the grieving process; she narrated the story with some humor before she got emotional while narrating.

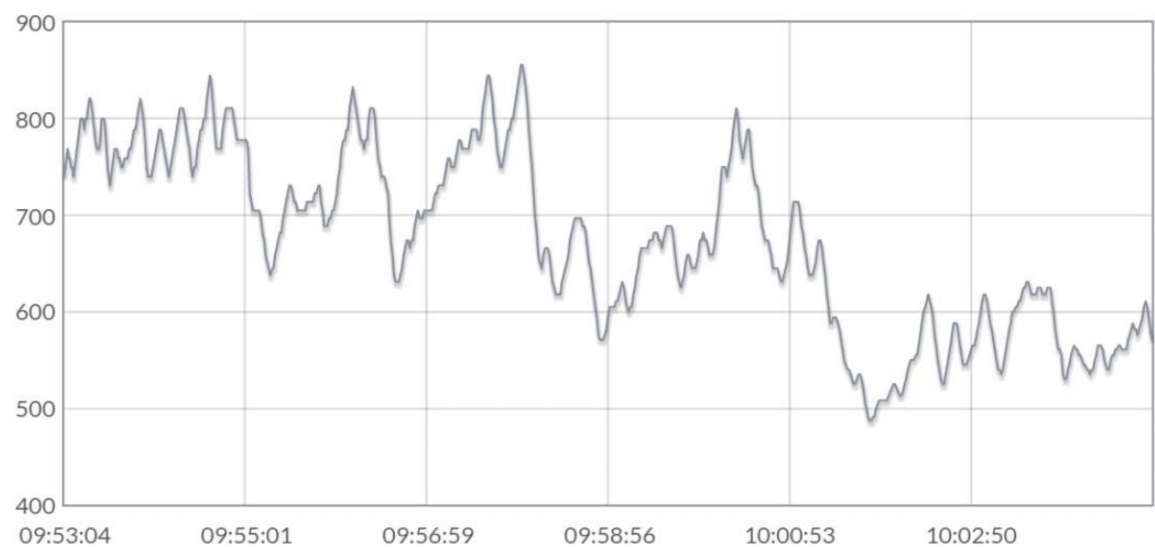


Image 5: Participant E RR Chart

Participant F: Had about three instances of humor. The first instance occurred at the first RR drop value of 1000 in which the participant started off their speech with a humorous introduction to their topic of vaccination, assuming that everyone in class should have a vaccine to be able to attend UAH. The second instance occurred at an RR value of 1120; it involved the participant

using sarcasm or wry humor to explain an instance in which the anti-vaccination stance resulted in adverse effects, such as death. The third instance occurred at an RR value of 990; it involved the participant using a humorous statement: “My right to swing my arm ends where your face starts” to drive home the point that vaccination should be mandatory.



Image 6: Participant F RR Chart

Participant G: This had one instance of humor, which occurred at an RR value of 450. It involved the participant conveying to the audience that the scientific community

didn't know a whole lot about how the brain works; the participant giggled slightly at his own comment, which elicited some laughs from the audience.



Image 7: Participant G RR Chart

Participant H: This participant's RR values were steady and the two times he had RR drops were associated with humor. The first instance occurred at the RR value of 500; it involved the participant starting off their introductory speech with some geography background in which the participant pronounced the funny name of his birth town. The second instance also occurred at

an RR value of 500; this involved the participant explaining his aversion to attending the University of Alabama in Tuscaloosa, as he believed that everything there revolved around American football. However, he then proceeded to apologize sarcastically and state "Roll tide," which elicited laughs from the audience.

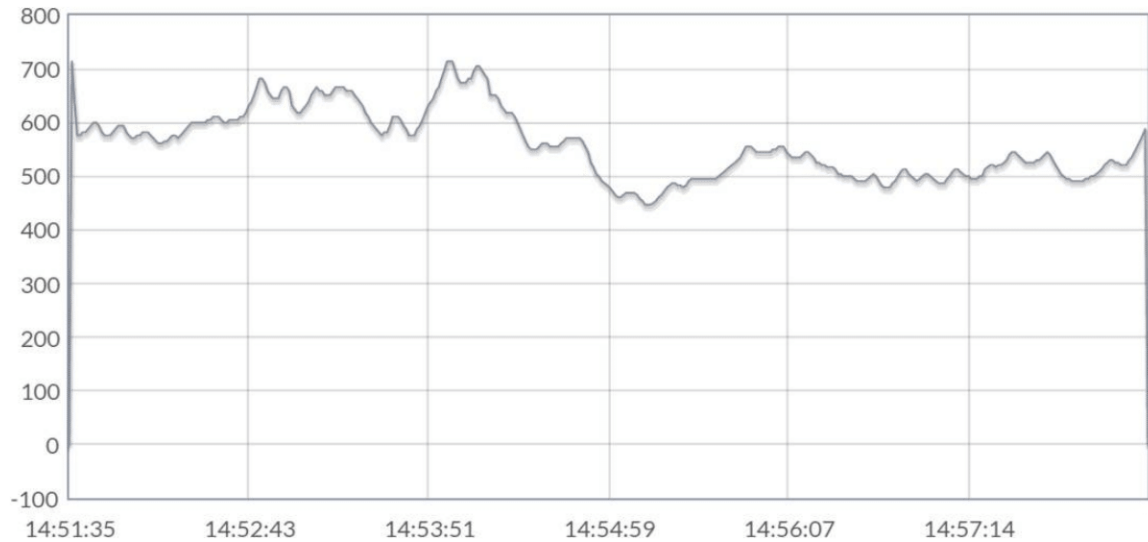


Image 8: Participant H RR Chart

5. Discussion

In relation to the Literature surrounding the use of humor in public speaking, this study provides empirical evidence that contradicts many of the existing recommendations around humor use in speeches. While humor may relax the audience (McRoberts & Larson-Casselton, 2006) and help establish rapport (Benacka, 2017), we found that laughter did not have the intended effect from threat softening (Kanchanapoomi, 2020), at least from the speaker's perspective where high stress levels were felt. American adults fear public speaking (Bronson & Alford, 2004), but the use of humor is not an effective antidote. Bronson and Alford's (2004) recommendation that students think of their performance as a 'funny situation' where the audience laughs along is not supported by the heart rate variability data. That said, there are other benefits to humor usage, such

as audience retention of information (Gruner, 1970) that could outweigh the consequences of humor use on the speaker.

This study gives empirical evidence for teachers and public speaking coaches who advise their students or clients to use humor in speeches. While humor can be rewarding, it appears to universally cause a heightened stress response in all speakers due to a sense of vulnerability. In some cases where the audience responded well, the speaker's stress level recovered. However, in other instances where the audience had minimal reaction or did not react at all, the speaker maintained a high level of stress. As a result, it might be a good tactic for public speaking teachers and coaches to provide pointers to their students on how to use humor in an effective and relevant way, such that it elicits a reaction from the audience. In addition, public

speaking teachers and coaches can provide training to their students on how to recover from the stress induced when humor is not received well by the audience during a speech; this way, even if the students maintain a high level of stress when using humor, they are better prepared for a negative outcome and might be able to recover faster and still deliver a good speech. Some practical tips on how students might alleviate stress associated with humor use in public speaking include, quickly moving on to the next topic, making eye contact with friends, not trying to explain the joke any further, or pausing to briefly look at notes or presentation slides.

Limitations

The current study did suffer from several limitations due to the research design. Due to the heart rate equipment, the sample size is smaller than a survey study could reach.

Additionally, the study relied upon college students who may react differently than the general population due to their younger age range and inexperience with public speaking. Most college speeches are also graded and influence students overall academic performance; as a result, this may put additional pressure on students and contribute to higher stress levels or influence the effect of humor on stress. Furthermore, due to the demographics of the available student body, the sample also lacked racial diversity. Lastly, the study was conducted in a college classroom which mimics many

public speaking forums but lacks a stage or riser.

Future Research

For future research, we would recommend gathering more data by increasing the sample size of the participants, in addition, it would also be good to diversify the sample by including other populations apart from college students and a wider variety of racial groups to observe the interaction of humor and public speaking anxiety in order to provide more general advice on how people can better utilize humor during public speaking. Furthermore, it would be interesting to see the effect of humor on public speaking anxiety in other settings apart from the college classroom setting, such as high school and middle school classroom settings, at public events such as town halls, or within classroom settings in which speeches are not graded and have less of an impact on students' stress levels.

Some additional questions we have, and hope can be explored more, is the effect of humor on public speaking anxiety when the incident of humor is planned and is a rehearsed part of a speech as compared to when it is unplanned and coincidental. Another interesting question, which can be studied in future, is the effect on stress when a speaker reacts to their own joke; for example, could laughing at their joke help speakers alleviate stress or does it increase their stress levels.

6. Conclusion

The current study sought to empirically understand how a public speaker's use of humor changes their stress response using an innovative heart rate measurement protocol. While we hypothesized that there would be a difference in stress reaction depending on if the speaker experiences high or low anxiety, no difference in stress level was found. Instead, all speakers experienced a heightened stress response when using humor in their speeches. This has implications for the ways we teach the use of humor in public speaking classes. When

taking center stage, laughs and giggles may not be the rewarding antidote to anxiety that many hope.

7. Acknowledgements

Acknowledgements goes to UAH Research and Creative Experience for Undergraduates for the opportunity to engage in research, as well as, my family and friends, Dr David Cook, Dr Wafa Orman, and Dr Brinda Mahalingam for their direction and support. Finally, I would like to thank Dr. Candice Lanius, whom I collaborated with on this paper, for all her great advice, support, and funny jokes.

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Analysis of a Generalized Discrete Periodic Model for the Spread of *Wolbachia* in a Mosquito Population

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Abstract

Mosquito-borne illnesses have posed an ongoing threat to humans, causing thousands of fatalities each year. *Wolbachia* bacteria have proven to be an effective way of limiting the ability of mosquitoes to transmit these diseases to humans, as well as to control the population by sterilizing male mosquitoes. For these reasons, researchers have performed field releases of *Wolbachia*-infected mosquitoes. To increase the likelihood that these releases will succeed, mathematical models have been developed to predict the spread of *Wolbachia* in mosquito populations following a field release. In a recently published article, a generalized model was proposed, with the intention of being applicable to a wide variety of release scenarios. Here, an analysis is performed of that model to find the periodic solutions of it, which determine the global dynamics of the system.

1. Introduction

Mosquito-borne illnesses such as dengue fever, Zika virus, and malaria have presented an ongoing public health issue. Historically, methods to reduce the impact of mosquito borne illnesses through vaccination or spraying insecticides have proven impractical on a large scale, and ideas to release large numbers of sterile mosquitoes in the wild raise concerns over unforeseen consequences in the ecosystem. A strategy that has gained popularity in recent years is the release of *Wolbachia*-infected mosquitoes. The *Wolbachia* bacteria prevents mosquitoes from carrying certain diseases that are harmful to humans, such as dengue fever. When an infected male mosquito mates with an uninfected female, the eggs will not hatch. This is called cytoplasmic incompatibility. When an infected female mates, *Wolbachia* is transmitted to the eggs; the percentage of eggs from an infected female that do not have *Wolbachia* is known as the maternal leakage rate. Thus, there are

two beneficial impacts of a field release. One of these is controlling the mosquito population through cytoplasmic incompatibility. Additionally, *Wolbachia* is spread throughout the mosquito population, by maternal transmission. This reduces the population's ability to spread disease to humans.

As researchers seek to maximize the effect of *Wolbachia*-infected mosquito releases, a number of mathematical models have been developed. These usually seek to handle special release cases, where assumptions are made with regards to male-to-female release ratios, cytoplasmic incompatibility and maternal leakage rates, or the number of releases needed for effective disease control. In a recent paper by Zheng et al. (2021), published in *Science China Mathematics*, a more generalized model was presented, which allows for varying release ratios and number of subsequent releases.

Zheng et al. (2021) demonstrated the effectiveness of this model by showing its equivalency to previous models for the relevant specific cases. Their paper concluded with open questions regarding the periodic release ratios in their model. A periodic solution is a repeating solution, in this case, a solution that repeats every T number of generations of mosquitoes. In order to effectively use the model, it is important to know the number and stability of the periodic solutions, hence the current questions regarding them. This paper attempts to answer those questions. Finding the T -periodic solutions for this model allows us to predict the infection frequency, and the behavior of that frequency, of *Wolbachia* in subsequent generations of the mosquito population.

The focus of this paper is to present conditions that guarantee the maximum number of periodic solutions for useful cases of the aforementioned model.

2. Literature Review

Most models that deal with the spread of *Wolbachia* bacteria among mosquitoes are simplified by assumption. In regards to assumptions about male-to-female release ratios, assumptions are typically made that either there is equal sex distribution (Shi and Yu), (Hu et al.), and (Li et al.), or that exclusively male mosquitoes are released (Li et al.). Another common set of assumptions are simplified values for certain population variables, including maternal leakage rate and cytoplasmic incompatibility (Hu et al.). It is also often convenient to assume the number of releases preformed (Zheng et al. 2019). While these assumptions make models simpler, and therefore easier to analyze and use, the assumptions may not be accurate or relevant for a given release scenario. When this occurs, it is desirable to use a model that is not reliant upon these assumptions, in order to obtain the most accurate and applicable results. The model examined here, presented by Zheng et. al. (2021), allows for varied sex distribution, release periods, and population variables, making it a generalized model, and thus more versatile.

The model in question is given by $x_{n+1} = F(x_n)$, where:

$$F(x_n) = \frac{(1-\mu)(1-s_f)(1+m_n)(x_n + f_n)}{s_h x_n^2 - (s_f + s_h + m_n(s_f - s_h))x_n + 1 + (1-s_f)f_n + (1-s_h)m_n + (1-s_f)f_n m_n}$$

$F(x_n)$, then, describes the *Wolbachia* infection frequency in one generation of

mosquitoes. This is an index of the relevant variables:

m_n : Ratio of released males to total males

f_n : Ratio of released females to total females

s_f : Relative fitness cost of infected females

s_h : Cytoplasmic incompatibility intensity (s_h percent of eggs from an infected male will not hatch)

μ : Maternal leakage rate (μ percent of offspring from infected females are uninfected)

There is one additional piece of notation that is important. Let $Q(x)$ denote $F(x_n)$ when $m_n = f_n = 0$, meaning that there are no releases in the generations described by Q . $P_n(x)$, $n = 1, 2, 3$, denotes generations where *Wolbachia* infected mosquitoes are released. In the case of $P_1(x)$, $f_n \neq 0$, $m_n \neq 0$. For $P_2(x)$, $f_n \neq 0$, $m_n = 0$, and for $P_3(x)$: $f_n = 0$, $m_n \neq 0$. The model to be solved is a composition of $Q(x)$ and $P_n(x)$. As an illustrative example of what this means, for $T = 5$ (a period of five generations), a periodic solution is x^* such that

$$h(x^*) = (Q \circ Q \circ Q \circ P_n \circ P_n)(x^*) = x^*$$

The first open question about this model covers the case where $m_n = f_n = \alpha$; the second, when $f_n = \alpha \neq 0$, $m_n = 0$; the third, when $f_n = 0$, $m_n = \alpha \neq 0$. For each of these cases, the model is examined for instances

where $\mu = 0$ and $\mu \in (0, \mu^*)$, $\mu^* \leq \frac{(s_f - s_h)^2}{4s_h(1-s_f)}$.

Conditions were sought to guarantee the

number of periodic solutions for each of these six cases.

3. Research Methods

Throughout this work, results were found by working with the equation in a fully abstract form, and were verified numerically using a graphing software.

At Least One Solution

The first goal of this research was finding conditions to guarantee that there is at least one solution to the model. It can be shown that for $x \in [0, 1]$, $Q(x)$ and $P_n(x)$, $n = 1, 2, 3$ are monotonically increasing. Additionally, it can be shown that there is an interval $I = [a_n, b_n]$, such that $Q: I \rightarrow I$, $P_n: I \rightarrow I$, $n = 1, 2, 3$. If $Q(\alpha_q) = \alpha_q$, $Q(\beta_q) = \beta_q$, $\alpha_q < \beta_q$, then $I \subseteq [\alpha_q, \beta_q]$. Similarly, if $P_n(\alpha_p) = \alpha_p$, $P_n(\beta_p) = \beta_p$, $\alpha_p < \beta_p$, then $I \subseteq [\alpha_p, \beta_p]$. When these conditions are met, the Intermediate Value Theorem (IVT) guarantees that there will be at least one solution to the model.

The Maximum Possible Number of Solutions

Next, the case was examined where the maximum possible number of solutions was present. The n th solution x_n^* is found $a_k < x_n^* < b_k$, where a_k, b_k are some zeros of $Q(x) - x$, $P_n(x) - x$. Then there is a solution in (a_k, b_k) when, either, $h(a_k) < a_k$ and $b_k < h(b_k)$, or a_k

$< h(a_k)$ and $h(b_k) < b_k$. Additionally, as mentioned above, Q and P_n are increasing at a_k, b_k . When these conditions are met, the IVT can be used to guarantee the existence of a solution between a_k and b_k . The given conditions are simple to check by a computer program.

4. Results

The IVT was used to prove that a solution lies on the intervals given below. This is ensured by the fact that the functions $Q(x)$ and $P_n(x)$, $n = 1, 2, 3$ are monotonically increasing on $x \in [0, 1]$. For $x \in [0, 1]$ and

$s_f, s_h, \mu, \alpha \in (0, 1)$, all of the derivatives of $Q(x), P_1(x), P_2(x), P_3(x)$ are positive.

It can be shown that for all $x \in (0, 1)$, $s_f < s_h, P_n(x) > Q(x)$, $n = 1, 2, 3$.

For $x = 0, x = 1, s_f < s_h, P_n(x) \geq Q(x), n = 1, 2, 3$. Coupled with this, and the fact that Q and P are monotonically increasing on our interval of interest, the following ideas can be observed from Q and P .

For all $P_n(x)$, with $x \in (0, 1)$, $P_n(x) > Q(x)$. When there are a maximum of three solutions, the following can be shown.

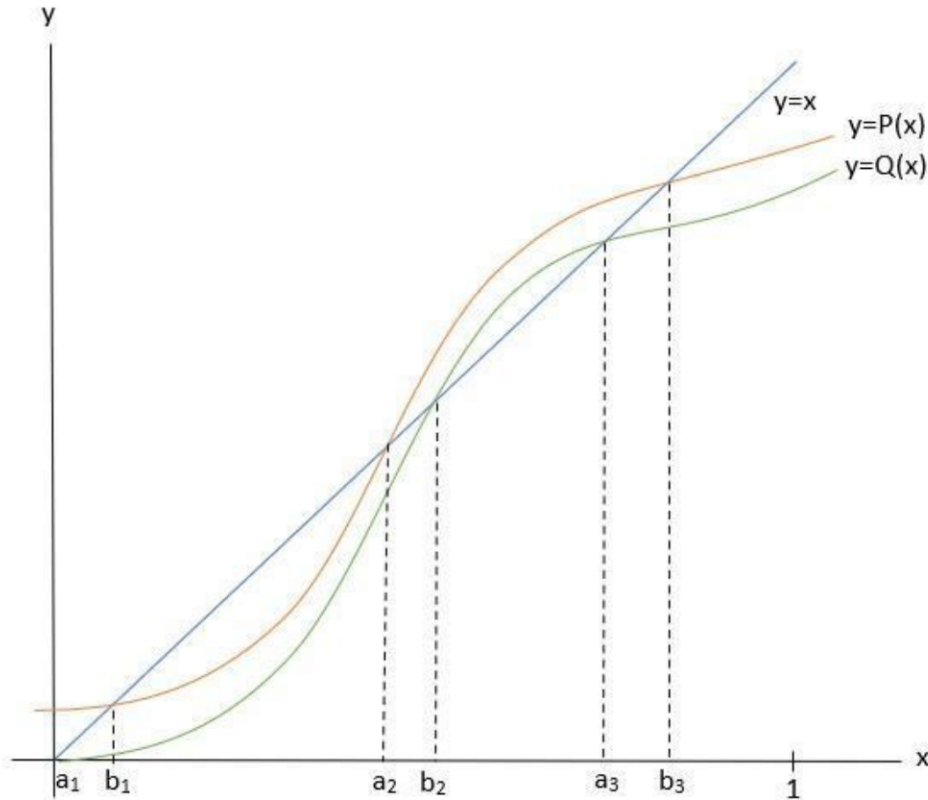


Figure 1: A representative graph for a case with three solutions

Consider Figure 1 above. For the first solution x_1^* , it is found that

$$a_1 = Q(a_1) < Q(x_1^*) < Q(b_1) < b_1$$

$$a_1 < P_n(a_1) < P_n(x_1^*) < P_n(b_1) = b_1$$

It is similarly true for the third solution x_3^* ,

$$a_3 = Q(a_3) < Q(x_3^*) < Q(b_3) < b_3$$

$$a_3 < P_n(a_3) < P_n(x_3^*) < P_n(b_3) = b_3$$

The same does not hold when the middle periodic solution, x_2^* , is considered. Rather, it is seen that

$$a_1 = Q(a_1) < Q(x_2^*) < Q(b_3) < b_3$$

$$a_1 < P_n(a_1) < P_n(x_2^*) < P_n(b_3) = b_3$$

This is the case when $n = 1$, and $n = 2$, for $\mu \in (0, \mu^*)$.

When there are a maximum of two solutions, the following may represent Q and P :

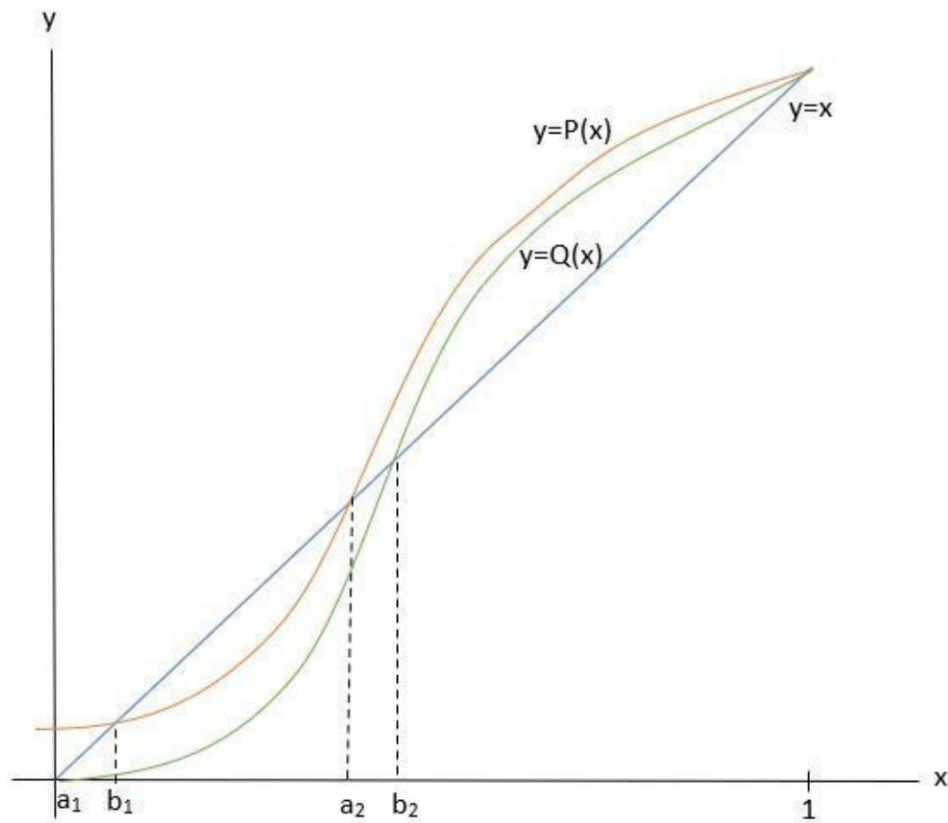


Figure 2: A representative graph for a case with two solutions

When the functions appear as in Figure 2, it is seen that

$$a_1 = Q(a_1) < Q(x_1^*) < Q(b_1) < b_1$$

$$a_1 < P_n(a_1) < P_n(x_1^*) < P_n(b_1) = b_1$$

which describe the interval that the first solution exists on.

For the second solution,

$$a_1 = Q(a_1) < Q(x_2^*) < Q(1) = 1$$

$$a_1 < P_n(a_1) < P_n(x_2^*) < P_n(1) = 1$$

This is the case when $n = 1$, and $n = 2$, for $\mu = 0$.

Alternatively, when there are a maximum of two solutions, it may be that Q and P are represented in the following way:

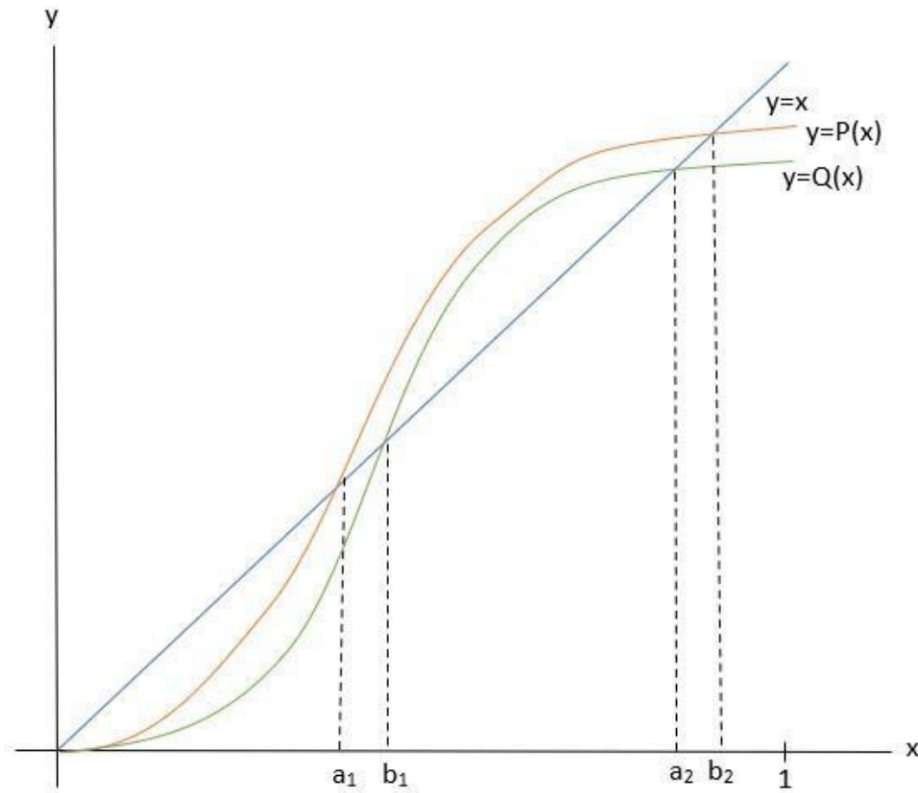


Figure 3: A representative graph for a different case with two solutions

In this case, it can be seen that, for the first solution,

$$0 = Q(0) < Q(x_1^*) < Q(b_2) < b_2$$

$$0 < P_n(0) < P_n(x_1^*) < P_n(b_2) = b_2$$

The interval for the second solution may be given more precisely:

$$a_2 = Q(a_2) < Q(x_2^*) < Q(b_2) < b_2$$

$$a_2 < P_n(a_2) < P_n(x_2^*) < P_n(b_2) = b_2$$

This is the case for $n = 3, \mu \in (0, \mu^*)$.

For the case where $n=3, \mu=0$, there is a maximum of one solution. The following is observed:

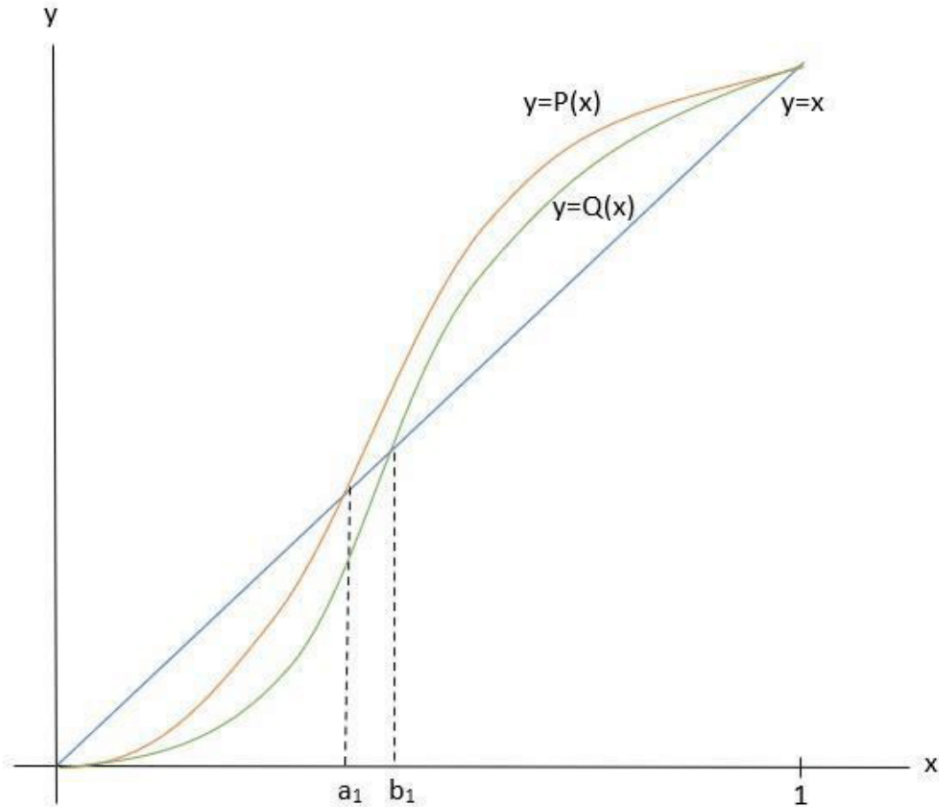


Figure 4: A representative graph for a case with one solution

For this solution,

$$0 = Q(0) < Q(x_1^*) < Q(1) = 1$$

$$0 = P_n(0) < P_n(x_1^*) < P_n(1) = 1$$

These pairs of expressions provide the interval $I = [a_n, b_n]$ described above. Since $Q: I \rightarrow I, P: I \rightarrow I$, there is a solution on I .

Solution Intervals

Here the intervals are provided on which the solutions exist, given that the corresponding conditions hold.

For the case $P_1(x): f_n \neq 0, m_n \neq 0$, when $\mu = 0$, there are a maximum of two solutions. Those solutions are found to be:

$$x_1^* \in \left(0, \frac{s_f + \alpha(s_f - s_h) - \sqrt{s_f^2(1+2\alpha) + \alpha^2(s_f - s_h)^2 + 2\alpha s_f s_h(1+2\alpha) - 4\alpha s_h(1+\alpha)}}{2s_h} \right)$$

$$x_2^* \in (0, 1)$$

When

$$\frac{\alpha}{1+\alpha} \leq -\left(\frac{s_f}{s_h}\right)^2 \left(\frac{1+\alpha}{\alpha}\right) + \frac{4-2s_f}{s_h}$$

Additionally, when $\mu \in (0, \mu^*)$, there are a maximum of three solutions. Let

$$\begin{aligned} \delta = & -2(s_f + s_h + \alpha(s_f - s_h))^3 + 9s_h(s_f + s_h + \alpha(s_f - s_h))[(1 - s_h)\alpha + \\ & (1 - s_f)\alpha^2 + s_f + (1 - s_f)(1 + \alpha)\mu] - 27s_h^2\alpha(1 - \mu)(1 - s_f)(1 + \alpha) \\ \xi = & \sqrt[3]{\frac{\delta + \sqrt{\delta^2 - 4[(s_f + s_h + \alpha(s_f - s_h))^2 - 3s_h[(1 - s_h)\alpha + (1 - s_f)\alpha^2 + s_f + (1 - s_f)(1 + \alpha)\mu]]^3}}{2}} \\ \sigma = & \frac{-1 + \sqrt{-3}}{2} \end{aligned}$$

Then

$$\begin{aligned} x_1^* & \in \left(0, \frac{-1}{3s_h} \left[-(s_f + s_h) + \xi + \frac{(s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f]}{\xi} \right] \right) \\ x_2^* & \in \left(0, \frac{-1}{3s_h} \left[-(s_f + s_h) + \sigma\xi + \frac{(s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f]}{\sigma\xi} \right] \right) \\ x_3^* & \in \left(\frac{s_f + s_h + \sqrt{(s_f - s_h)^2 - 4s_h\mu(1 - s_f)}}{2s_h}, \frac{-1}{3s_h} \left[-(s_f + s_h) + \sigma\xi + \frac{(s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f]}{\sigma\xi} \right] \right) \end{aligned}$$

When

$$18s_h(s_f + s_h)[(\alpha + \mu)(1 - s_f) + s_f](1 - \mu)(1 - s_f)\alpha - 4(s_f + s_h)^3(1 - \mu)(1 - s_f)\alpha + (s_f + s_h)^2[(\alpha + \mu)(1 - s_f) + s_f]^2 - 4s_h[(\alpha + \mu)(1 - s_f) + s_f]^3 - 27[s_h^2(1 - \mu)(1 - s_f)\alpha]^2 > 0$$

In the second case, where $P_2(x)$:
 $f_n \neq 0, m_n = 0$, when $\mu = 0$, there are a maximum of two solutions. These are found

$$x_1^* \in \left(0, \frac{s_f - \sqrt{s_f^2 - 4s_h(1-s_f)\alpha}}{2s_h}\right)$$

$$x_2^* \in (0, 1)$$

When $\mu \in (0, \mu^*)$, and there are a maximum of three solutions, let

$$\delta = -2(s_f + s_h)^3 + 9s_h(s_f + s_h)[(\alpha + \mu)(1 - s_f) + s_f] - 27s_h^2(1 - \mu)(1 - s_f)\alpha$$

$$\xi = \sqrt[3]{\frac{\delta + \sqrt{\delta^2 - 4((s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f])^3}}{2}}$$

$$\sigma = \frac{-1 + \sqrt{-3}}{2}$$

Then

$$x_1^* \in \left(0, \frac{-1}{3s_h} \left[- (s_f + s_h) + \xi + \frac{(s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f]}{\xi} \right] \right)$$

$$x_2^* \in \left(0, \frac{-1}{3s_h} \left[- (s_f + s_h) + \sigma\xi + \frac{(s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f]}{\sigma\xi} \right] \right)$$

$$x_3^* \in \left(\frac{s_f + s_h + \sqrt{(s_f - s_h)^2 - 4s_h\mu(1 - s_f)}}{2s_h}, \frac{-1}{3s_h} \left[- (s_f + s_h) + \sigma\xi + \frac{(s_f + s_h)^2 - 3s_h[(\alpha + \mu)(1 - s_f) + s_f]}{\sigma\xi} \right] \right)$$

When

$$18s_h(s_f + s_h)[(\alpha + \mu)(1 - s_f) + s_f](1 - \mu)(1 - s_f)\alpha - 4(s_f + s_h)^3(1 - \mu)(1 - s_f)\alpha + (s_f + s_h)^2[(\alpha + \mu)(1 - s_f) + s_f]^2 - 4s_h[(\alpha + \mu)(1 - s_f) + s_f]^3 - 27[s_h^2(1 - \mu)(1 - s_f)\alpha]^2 > 0$$

For the final case, where $P_3(x)$:
 $f_n = 0, m_n \neq 0$, the case where $\mu = 0$
 has a maximum of one solution in the

interval $x_1^* \in (0, 1)$.

When $\mu \in (0, \mu^*)$, there are a maximum of two solutions, which are found to be:

$$x_1^* \in \left(0, \frac{s_f + s_h + \alpha(s_f - s_h) + \sqrt{(s_f - s_h)^2(1 + \alpha)^2 - 4s_h\mu(1 - s_f)(1 + \alpha)}}{2s_h} \right)$$

$$x_2^* \in \left(\frac{s_f + s_h + \sqrt{(s_f - s_h)^2 - 4s_h\mu(1 - s_f)}}{2s_h}, \frac{s_f + s_h + \alpha(s_f - s_h) + \sqrt{(s_f - s_h)^2(1 + \alpha)^2 - 4s_h\mu(1 - s_f)(1 + \alpha)}}{2s_h} \right)$$

When

$$\alpha \leq \frac{4s_h\mu(1 - s_f)}{(s_f - s_h)^2} - 1$$

5. Discussion

The conditions provided above allow someone using the model to determine whether the given number of periodic solutions exist for the proposed variable values. These periodic solutions determine the global dynamics of the model. If the conditions are met, an interval can be found on which the periodic solutions exist. While these conditions and intervals are time-consuming to determine and check by hand, it would be quite simple to write a computer program to perform the checks

and computations, and the conditions and intervals described are general so as to be applicable for any situation in which the studied model is being used.

While conditions were provided for the maximum number of periodic solutions, analysis should be done of the stability of the periodic solutions. This would allow researchers to fully understand the global dynamics of the system, and thereby make our results as useful as possible.

6. Conclusion

Field releases of *Wolbachia*-infected mosquitoes provide a viable solution to the long-standing problem of mosquito-borne diseases. However, these releases require many resources of time and money to prepare. This has given rise to a good deal of modeling work surrounding such releases. These models help to ensure the success of proposed release plans, but are often too specialized to be broadly useful. Here, an analysis has been presented of a generalized model for *Wolbachia* field releases. Given that the corresponding conditions are met, the intervals that solutions appear in when the maximum number of solutions exist can be shown. This allows researchers to more clearly use the studied model to determine the success of planned field releases in advance of their execution and to prepare accordingly.

7. Acknowledgements

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Healthy Diet Affordability in North Alabama During COVID-19

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Abstract

Previous research has shown that nutrient dense, low-calorie foods are bought at higher rates by those with higher incomes.¹ These types of studies have engulfed common knowledge on healthy diet affordability. However, a recent study of the Mechoopda Indian Tribe of Chico, California, found a healthy diet filled with popular foods can be afforded by all members of the community.² By focusing on healthy foods people want to eat and their localized affordability, research applicability in policy clearly increases.

This study uses a framework similar to the California study while tweaking a few aspects to better suit a more regional research effort. Aside from being conducted in Huntsville, Alabama, the National Institutes of Health's (NIH) healthy southern diet was used as a framework, price data was collected online as opposed to in-store, and the study was conducted during COVID-19.

The data collected suggests that a healthy Southern diet is realistically affordable. Since some calculations required its usage, the cost analysis can also be used for policy guidance on future Supplemental Nutrition Assistance Program (SNAP) benefit apportionment.

1. Literature Review / Introduction

There is a collection of research on how affordable a healthy diet is; however, cost analysis and affordability evaluations on localized healthy diets is scarce. Only one other study (Jetter, et al. 2019) has pin-pointed culturally and regionally popular 'healthy' diets and it seems that studying the affordability of healthy diets that are popular within a region would yield a more applicable result. This assumption is rooted in the understanding that the diet whose affordability is being tested is more likely to be adopted by the particular inhabitants of a certain area and thus any decision on affordability would be much more accurate than a randomized selection of healthy foods. For instance, a nutritious diet that affords a glass of sweet tea during dinner may not be popular for members of the Pacific Northwest, so including that in a diet cost analysis would detriment the applicability of the designed diet and its

total cost. This makes discovering whether low-income individuals in North Alabama can bear the cost of the NIH's healthy southern diet during the COVID-19 pandemic pertinent to fully understanding healthy diet affordability on a localized scale.

The lenses through which the issue of healthy diet affordability is viewed are multifaceted. The United States Department of Agriculture (USDA) study by Golan et al, states that "Low-income households that receive maximum benefits from SNAP usually have the purchasing power necessary to afford healthy diets; others may not." (Golan, et al. 2008) This study, however, could be viewed as a de facto defense of the necessity of the federal SNAP program. The Golan paper uses a market basket approach and collects data from across the country to justify what level of SNAP assistance the USDA provides and why a diet similar to the thrifty meal plan will be affordable so long as the recipient is

not in the lowest income group in an area with the highest possible food costs. This paper has some drawbacks: it is a report created by the federal government used to explain a governmental program and it takes food price averages and consumer spending averages for the entire country when creating its argument. Neither of these factors make the paper in any ways necessarily flawed, but the former issue creates an opportunity for skepticism from readers and the latter disrupts the applicability of the findings on any particular consumer.

Two other studies dive a bit deeper into the issue of healthy diet affordability. One paper examines the dietary habits of members of Kings County, Washington, and their subsequent diet score and cost. “Are socio-economic disparities in diet quality explained by diet cost?” (Monsivais, et al. 2012) collected information from individuals about their socioeconomic standing and what they consume. The survey was restricted to only Kings County, Washington and analyzed correlations between socioeconomic labels and diet quality. They found “Socioeconomic differences in nutrient intake [to] be substantially explained by the monetary cost of the diet.” (Monsivais, et al. 2012) This paper goes on to assert that a higher monetary cost of diet correlated with a higher nutrient score. The correlation seems defensible from a layman perspective but the regional significance may play a big part in the conclusions since that area of the United States is notoriously more expensive and more white than a lot of the country. (Mayo & Turnbull 2011; Guy 2019) This study also

only proves a correlation between price and healthiness of diet which, while more precise and informative than the USDA study, is not truly answering whether or not any income level can afford a healthy diet.

Another study, similar to the one in Kings County, was conducted by David Kern who found “Healthier foods cost nearly twice as much as unhealthier foods per serving on average.” (Kern, et al. 2019) This second study was a bit different in that it used a sample of individuals from different cities across the country. The food price data for the second study was collected from 11 different states. This was more comprehensive in scope than the study conducted in Washington however it did not answer directly whether or not a healthy diet is affordable across income levels. A study focusing on the prices of foods in a particular area eaten by a certain people group that lives there would be much more adequate in its measurement of the affordability. While the Kings County paper does address localized food costs, again, their location is significantly different than that of the rest of the country and simply noting a correlation cannot be used as a decision variable on the affordability of a given diet to individuals across certain income groups.

Both studies utilized a food frequency questionnaire to determine what their participants frequently consumed and then used different means upon which to score the diets. However, they didn’t answer the bigger question of healthy diet affordability for what people eat in a certain region. From the study of Kings County and the paper from David Kern, we find a much

higher level of analysis than the USDA. We also now know that in one county in Washington and in a selection of various cities across the county, healthier food is more expensive and more likely to be consumed by those in a higher socioeconomic population. The latter two studies, however, don't address the issue that the USDA was pursuing: how affordable is the healthy diet.

The market basket approach seems to be the best way to approach a study of affordability between SNAP and non-SNAP customers. However, the USDA collected data far too broad to address the preferences of any particular region. Both the Kings County and Kern papers found a correlation in the geographical areas that they studied and provided analytics that the USDA paper didn't. But, they did not address the larger issue at hand which is affordability of a healthy diet at any income level.

Jetter et al, in a study *Yes we can. Eating healthy on a limited budget*. uses a market basket approach to measure diet affordability at all income levels - since, if the lowest income level can afford it, any subsequently higher income level should also be able to afford it (Jetter, et al. 2019). The use of a menu that conforms to the region is one of the most unique things about this paper and could be replicated in other regions in order to make a more realistic determination of whether eating healthily is affordable.

There are also a collection of papers that may seem to contradict some of the findings in this paper. However, it should be noted that their correlations only point out a possible outcome of diet choice. Therefore,

as this paper implicitly suggests, diet choice and adherence to said diet is very important. Some of the studies referred to earlier include a French national food consumption survey that found, "Participants in the lowest quartile of energy cost had the highest energy intakes, the most energy-dense diets and the lowest daily intakes of key vitamins and micronutrients. Participants in the highest quartile of energy cost had lower energy intakes, and diets that were higher in nutrients and lower in energy density" (Andrieu & Drewnowski 2006). The findings in this paper are evidence of the current predicament of the nutritional and wage gap. It should be noted that what is currently happening is not the necessary permanent circumstance, nor does it suggest that changing the current predicament will be unconquerable or unrealistically difficult to change. A key finding in another paper may also make the findings within this paper a bit more difficult to digest and so should be addressed here. A list of 372 foods and beverages in Seattle, WA, were recorded for price and it was found that "High-energy-density foods provided the most dietary energy at least cost." The researchers later noted that, "The sharp price increase for the low-energy-density foods suggests that economic factors may pose a barrier to the adoption of more healthful diets and so limit the impact of dietary guidance." Aside from the studies being conducted in two different regions, we can address whether economic factors do pose a barrier to the adoption of more healthful diets. A key finding in this study is that these correlations are not necessarily indicators of the feasibility of diets if their

costs are lower than the current expenditure on food by those in the lowest income and high energy consumption groups.

Research in this field has found a couple of possible paths to increase the frequency of healthy diet consumption outside of addressing perceived affordability restrictions. For instance, Tiwari et al found that “frequent meals away from home were associated with lower-quality diets and higher self-reported food expenditures,” when compared to those meals made at home. Therefore, “Lack of time, nutrition knowledge, and cooking skills are powerful deterrents to cooking at home.” (Tiwari, et al. 2017) If we assume that those in the lowest socioeconomic groups are eating a higher frequency of meals away from home, we could pinpoint that as a more likely cause of their relatively poorer health indicators. Similarly, lack of time, nutrition knowledge, and cooking skills could also explain why adoption of a healthy southern diet could still be difficult even after an affordability barrier is disproven.

This paper will apply the usage of a localized menu for the south, and more specifically, northern Alabama. The study utilizes the NIH’s healthy southern diet as the menu of choice and creates monthly shopping lists from online grocers. These tweaks will allow for the most applicable philosophy of a realistic healthy diet affordability, determined by “Yes we can.”, to understand whether or not a healthy southern diet is affordable. The diet will also consist of 1,600 calories. This may seem to be misleading when making claims about the findings of this paper, however, this diet is still suggested by the NIH and can be used

as a weight loss diet. This does not, however, necessarily mean that it is a weight loss diet. These two seemingly contradictory facts are resolved by *Diet in the management of weight loss* which concluded that gradually calorically restrictive diets “are well-tolerated and characterize successful strategies in maintaining significant weight loss over a 5-year period” (Strychar 2006).

A healthy southern diet is affordable for the vast majority of Americans living in North Alabama. A healthy southern diet must be affordable for the vast majority of North Alabamians if all the components of the diet cost less, on average, than what is currently spent on food by those with the lowest food expenditures. We also know that COVID-19 has highlighted, in at least one way, the accessibility of affordable diets for the vast majority of North Alabamians. We can be certain that this is true if the inclusion of the food delivery cost to the diet’s cost is still less than the food spending of the group with the least spending on food on average.

2. Data Collection

The study was conducted between September and October of 2020 in North Alabama. This time period is significant because it was during the COVID-19 pandemic. Prices were recorded online and this, along with restrictions and consumer sentiment over safety concerns from the pandemic, may have had an effect on product prices. Any comparative tables using consumer expenditure data are sourced from the U.S. Bureau of Labor

Statistics' "Average expenditure, share, and standard error tables."

Menu Selection

To have a centralized point of measurement of multiple different grocers, the NIH's "Aim for a Healthy Weight - Southern Cuisine" diet plan was used as the source of the shopping list at each local grocery store. This allowed the use of a market basket approach by measuring price and availability of foods acknowledged by the National Institute of Health as commonly consumed by a certain group of people. This menu was selected because it was created by the NIH, so its assertion of "healthiness" and applicability as a cuisine common to a certain region is most likely accurate. Also, because it is created by the NIH, it is easy to access for any readers of this paper for reference.

Menu Assumptions

The NIH's diet has two different caloric plans, 1,600 and 1,200 daily calories and the 1,600 calorie plan was used. The caloric amount may seem startlingly low, however, it should be noted that the meal plan is a weight loss plan and eating less calories from more nutrient-dense sources is a scientifically supported method of weight loss (Strychar 2006). This issue is also further addressed toward the end of the literature review/introduction section.

The menu was also tweaked to include alternatives to some foods to make the expectation of consumption more realistic. This included the morning glass of milk being substitutable with yogurt, either

plain and lowfat or a smaller amount of an artificially sweetened option. Orange juice could be exchanged for strawberries or blueberries. If someone did not want skinless baked chicken for lunch they instead could have turkey breast or a fish filet. Brown rice was not required with lunch, a baked potato or corn could suffice. For dinner, lean roast beef or pork tenderloin could equally constitute the meat for the meal. Similarly, both sweet and white potatoes were interchangeable. For dessert, honeydew melon, an apple, a peach, or a banana were all options. All exchange options were provided according to the NIH's Food Exchange Lists (National Heart, Lung, and Blood Institute).

Price Recording and Product Selection

A handful of changes to the textual specifics of the NIH's diet plan were also necessary because of the logistical challenges presented by specific product availability and the need for measurement consistency. Firstly, it should be acknowledged that since the diet plan allowed for substitutions, substitutions were included at random to ensure the highest level of diet applicability. For each store, the cheapest item that matched the description provided by the meal plan was recorded. Meat was fresh and the price of the lowest unit amount needed to suffice the monthly diet amount was recorded. Raw vegetable weights were recorded using the Food and Nutrient Database for Dietary Studies for consistency. Outside of English muffins and sweet tea, if an item on the diet was commonly prepared using a mix, the mix was recorded. Rice weight was presumed to

be dry, rather than cooked, weight. Baking powder biscuits were substituted with "Pillsbury Junior Biscuits" at Kroger and Walmart. Publix did not have that product so "Pillsbury Grand Biscuits" were used - assuming half of one of the replacements would suffice for the small baking powder biscuit called for. Brown sugar package measurements were not consistent, so the amount for each store is calculated based on the specific packages measurements. It was assumed one pan of cornbread made 5 medium slices.

Store Cost Calculations

The cost of diet for each store first required store site selection. Each specific store was selected based on the closest choice in reference to the University of Alabama in Huntsville campus. Then, the cost of enough of each good to only cover the exact needs for a month for one person were selected. The average price per meal per store was calculated from the grocery list resulting from the previous step. This resulted in a per meal per store cost that could then be used for various calculations.

3. Data Analysis

	Kroger	Walmart	Publix
Breakfast	1.43	1.32	2.03
Lunch	1.68	1.5	2.33
Dinner	3.49	2.78	4.3
Snack	0.32	0.24	0.45
Daily Total	6.92	5.84	9.11
Weekly Total	48.44	40.91	63.74
Monthly Total	214.5	181.17	282.28

Average Per Meal and Daily Food Costs

To bring value to the collection of price data from three major grocers, we must consider the total costs. We can see that Walmart has the lowest average daily total price, followed by Kroger and finally Publix. This ranking also translates into weekly and monthly total costs. Dinner was significantly more expensive than any other meal throughout the day, constituting 50, 48 and 47% for each grocer, respectively. The

snack category only consisted of saltine crackers and mozzarella cheese, which explain its drastically lower average daily cost.

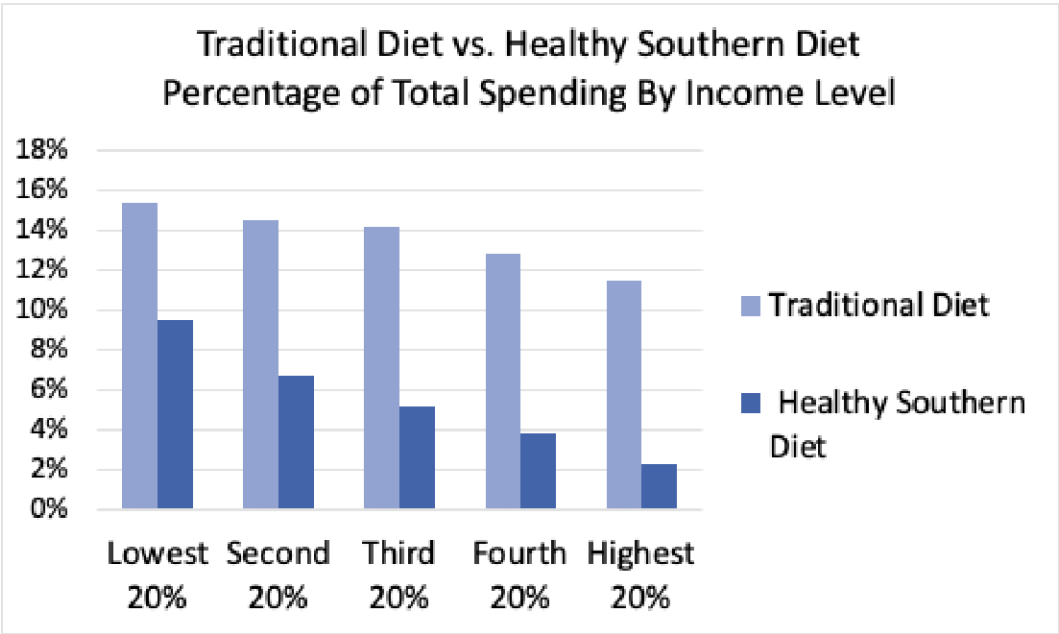
Significance of Lean Meat in Diet Cost

The cost differences between dinner and all other meals are largely due to the frequency of lean roast beef which can be more frequently substituted with pork tenderloin to reduce cost further and still be

in compliance with the NIH diet guidelines. The lean meat chosen during lunch and dinner were either the first or second most costly item in each meal possibility. This places great significance on the frequency of particular lean meat choices. During lunch, fish was the most expensive lean meat option on average across all three grocers, followed by baked chicken and finally turkey breast. During dinner, lean roast beef was more expensive than its only substitute,

pork tenderloin. This means that an even lower cost diet could be found by increasing the frequency of cheaper lean meats. We can also see how the price of lean meat also affects the rankings of total diet cost. Publix always has the most expensive average lean meat option across all categories, followed by Kroger and then Walmart. This is the exact same order found for total diet costs.

4. Results



Here, all U.S. spending on food on average as a percent of total spending is split between five different income levels. These income levels range from the lowest 20% up through the highest 20% of wage earners. The healthy southern diet’s cost makes up less of the total spending of even the lowest 20% of income earners in the country. The percentage declines as we move to higher and higher income levels, as well. This

makes sense since as people make more money, they tend to have a higher level of spending and the cost of the healthy southern diet is constant. A traditional diet makes up 6% more of total spending for the bottom 20th percentile and 10% more for the top 20th percentile.

If we isolate the results for only the most affordable of the grocery options, Walmart, the results become even more

drastic. At the bottom 20th percentile, individuals would cut their spending on food by more than half. This results in a savings of more than \$2,000 per year, or 8% of total spending for this percentile. This would result in a de facto addition of \$150 per month for every single person, not household, in the lowest socioeconomic group. The results grow substantially as we move up the income groups. If we were to see the highest 20th percentile consume the healthy southern diet at Walmart, they could realize a saving of almost \$1,000 per month per person on their food spending.

5. Conclusion

These results largely disagree with the popular sentiment in society and a lot of the common knowledge about the correlation between healthy diet cost and the health of the poorest citizens. A healthy southern diet is not just affordable, it is cheaper than what every single income level spends on food on average. This conclusion still holds when including the cost of delivery for the meals. It seems clear that COVID-19 did not have an effect on the affordability of a healthy southern diet since the diet still cost less than what the group with the least spending on food already spends, regardless of need for delivery. The diet is also filled with foods that are popular among people in the area and are therefore logically more familiar, easier to prepare, and more desired than traditional diet foods. This points instead to the necessity of knowledge for improving the diets of those in the lower socioeconomic levels. As previous papers have noted, there is

evidence that seeing caloric information about high calorie foods does not actually deter those in poor socioeconomic areas from consuming high calorie fast food (Elbel, et al. 2009). It would make sense that this sentiment is a motivator for why this diet is still not applicable for many disadvantaged people. The level of knowledge of how to prepare the foods in this diet, how to use SNAP funding to access the food even more affordably, and how to compare and appreciate the nutrient density of the foods people are consuming seem to be a much more worthwhile avenue to investigate as to the cause of poor nutrition and subsequent health conditions among lower socioeconomic communities. These changes, in combination with the adoption of regionally-specific variants of the healthy southern diet if similarly affordable, could have serious positive implications. The increased knowledge of food preparation methods and nutritional information could help increase diet adherence through the ability to substitute foods to create diverse meal plans that appease personal taste and become relatively quick to make, two other commonly cited issues (Tiwari, et al. 2017). Similarly, with the knowledge of SNAP benefits usefulness to the administration of the diet, we could see additional savings on food for those in the lower percentile groups on top of the already nearly 50% decline experienced through the diet change. This could lead to a greater increase in spending power among the poorest members of society than any other group and could have an unimaginably positive impact on their quality of life.

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The Rhetorical Landscape of Public Memory in Alabama

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Abstract

Public memory is a complex concept that concerns the events and individuals that are present or important in the minds and lives of groups of people. Public memory can put certain ideas or narratives on display about these events and people that further influence the public mind. For example, there has recently been much controversy surrounding public sites of history, namely those commemorating the Civil War era Confederacy. This has sparked much debate about the way we commemorate histories and how we choose what histories are commemorated. The aim of this project is to examine and understand not only the types of events and people that are commemorated in Alabama's public memory, but also the ways in which these things are portrayed. By examining these aspects of public memory, we can understand what has driven problematic commemoration of old histories and use that knowledge to create more nuanced and informed sites of public commemoration in the future.

Keywords: rhetoric, public memory, commemoration, memory studies, historical markers

1. Introduction

To commemorate something in the public eye is to give it the utmost attention, bringing to light stories that seemingly hold great significance. The stories and individuals that gain this type of public commemoration shape the way onlookers perceive and understand the history of a given place. This phenomena is the occurrence of public memory and it is a vital aspect of understanding events and stories not only in a historical context, but a rhetorical one as well. Kendall Phillips says, "...memory highlights the extent to which these constituted and constituting memories are open to contest, revision, and rejection. Thus...to speak of memory in this way is to speak of a highly rhetorical process" (Phillips).

Rhetorical analysis and the study of public memory are important and growing fields of study. The analysis of sites of

public memory allow us to understand the individuals and events that act as "an memory" (Wilson). The collective memory Wilson discusses serves as the basis of how we understand active presence in our collective imagination and sites of public commemoration, in that these sites are not simply relics of the past, but active purveyors of what certain groups deem important. This is a point that other scholars, like Edward Casey, get at as well. Casey mentions that, regarding sites with a large physical presence, "their very massiveness and solidity almost literally enforce this futurity" (Casey). The social prevalence and enduring nature of sites of public memory are part of what opens them to this kind of analysis and criticism. Part of what this paper engages is known as ideological criticism, a subset of rhetorical analysis which focuses on the ideas being presented

through the use of rhetorical devices. Ideological criticism aims to understand “how ideology and rhetoric work in tandem to create historical ‘truths,’” (Na’puti).

This work aims to examine the rhetorical and ideological qualities of Alabama’s public memory through the types of stories that are told to the public sphere, but most importantly the understanding of how those stories are told. It will examine aspects of Alabama’s public memory through multiple lenses such as its representation of racial/ethnic groups and gender identities. Then, a more condensed timeline of public memory in Alabama will be assessed to understand how the rhetorical landscape of this public memory has changed over time.

This paper also utilizes many examples of historical markers and sites of public memory throughout the state of Alabama. It examines individual sites and uses them to put certain narratives on display that paint a picture of the status of Alabama’s public memory. Each example used was chosen because of its relationship and relevance to the status quo of the given lens through which it is analyzed. For example, a marker that commemorates the history of an Indigenous population that is located on a known site that was inhabited by Indigenous people may have been chosen for analysis over other similar markers that may not have the same rhetorical strength based upon their location. It is important that we understand and analyze sites of public memory, like the ones in Alabama, because it allows us to understand our past in more depth by understanding the biases of the recorders of history and gives us the skills

and opportunities to provide a more diverse and nuanced recording of history going forward.

2. Race/Ethnicity

There are many aspects or qualities that influence the rhetorical methods used by the creators of historical markers, the first of which we will explore is race or ethnicity. Race and ethnicity have traditionally played a crucial role in the history of Alabama and the entire United States and thus, only naturally, also play a large role in the public perception and recognition of that history. As is the case with other forms of history, dominant groups will retain control over what is remembered and what narratives are pushed within the public sphere. Later, this section, and the article as a whole, will explore exactly who those groups are and what narratives they attempt to push. Over time, however, that dominant group has loosened its grip on public memory and the stories of other groups are finally coming into play.

In Alabama, there are only a few key racial or ethnic groups recognized in its historical marker system and public memory: these groups being Indigenous people, White people, and Black people. This section aims to explore the varied history of these groups in Alabama, how they are and have been remembered, and why they are remembered in this way and how that is affected by the rhetorical methodology of historical markers and their creators.

Indigenous History

The history of Indigenous groups in Alabama, especially the history publicly portrayed in these historical markers, tells an interesting story. Having been the first ethnic group in the area long before the arrival of White settlers or any other racial group, one might assume that they would have a bountiful history to be recognized in public memory. However, this is not necessarily the case. Though Indigenous people surely had a rich history long before they interacted with newcomers like White settlers, much of the content of the markers that portray their history centers them around their relationship to those White settlers. In this section, I will explore the rhetorical implications of the historical markers that portray the history of Indigenous people through the examination of a few common characteristics or contexts shared by many of the markers, as well as explore an argument as to why there is so little publicly recorded history of these groups.

Many of the few existing public markers dedicated to Indigenous history share one of a few common pieces of context. The first common context that some of these markers share is in that they are often located, and even purposefully concentrated, in a select few places that can be directly linked to Indigenous groups. For example, the marker “The Bottle Creek Site” in Baldwin County denotes the area as being the site of a large Indigenous mound center (Lang, Appendix B). Since the site holds such historical significance, they began to create more markers relating to local Indigenous groups that they could

place in the same location. This practice can also be found being utilized in many other prominent Indigenous sites across the state. Edward Casey purports that this practice is vital, in that the location of a site of public memory “...lends itself to the remembering and facilitates it at the very least, but also...embodies the memory itself” (Phillips). The grouping together of these markers in prominent indigenous locations serves as a rhetorical device in itself, which has interesting implications with the potential reasoning as to why not much public indigenous history remains that will be explored later.

Another shared context that is found in markers regarding Indigenous history relates to their centering around Indigenous relationships with White settlers. This context is that of conflict between Indigenous groups and White settlers. Many markers, such as the “Creek Indian Campaign Memorial” created in 1918 in Calhoun County, tell the history of conflict between the two groups (Lang, Appendix H). Markers such as these do not serve to tell a true or full history of the events, but to praise the winners and condemn the losers, as can be found in the type of language used. This memorial states that the creators “...believe it is our duty to our country to love it...and defend it against all enemies” (Lang, Appendix H). This marker creates an interesting rhetorical situation because in its text, it refers to the conflict between Indigenous groups and White settlers that had just passed its centennial anniversary, while also being created in the era of the first World War. This memorial marker serves as an example of the way in which

contemporary events or sentiments can be used to alter or to create certain perceptions of past events or people.

The third and final context of these markers I will explore is in their connection to the erasure of Indigenous history. By this, I mean the more contemporary, public recognition of older attempts to remove Indigenous people and their histories. Examples of this type of context can be found throughout Alabama, with the most glaring ones relating to the experiences of the Trail of Tears. One “Trail of Tears” marker in Madison County refers to the well-known event, giving some of its general history, how it occurred in the local area, and ultimately passes judgement on it calling it “one of the darkest chapters in American history” (Lang, Appendix AS). This marker, and others like it, display an interesting change in the rhetorical methodology of public memory in the state. Unlike markers created much earlier, this marker passes judgement on a historical era or event, which is a relatively new occurrence in the realm of Alabama’s public memory sites. This is a concept that will be explored in a later section, but is worth mentioning because of its direct impact on how Indigenous history is told and granted a stake in Alabama’s public mind.

Buildings, physical monuments or memorials, and pieces of writing are all methods by which history is located and often preserved. When it comes to Indigenous groups in Alabama, however, there are not many of these forms of historic preservation to be found. This is where the argument for Alabama’s lack of Indigenous historical markers comes into play. Since

historic preservationists do not have much physical history from Indigenous people to gather information and make assertions about, they can not create historical markers for a history that they do not know. The justification for this point of view can even be found in some of the historical markers themselves. The “Words of Resistance” marker in Morgan County relays the story of the creation of “a platform to speak out against removal of Cherokee people from their homeland...” (Lang, Appendix AZ). Also in that marker, there is a clear distinction made that “Oral tradition...long told the history of the Cherokee people” (Lang, Appendix AZ). While it does acknowledge the creation of the Cherokee syllabary, this was a relatively late creation that would have missed much of their previous history. This argument provides an interesting new lens with which to analyze the rhetorical strength and intention of historical markers with regards to the history of Indigenous groups, not only in Alabama, but everywhere else too.

White History

The public history of White people in Alabama finds itself squarely in the middle of its Indigenous and Black counterparts in relation to time, but not necessarily in relation to public memory or recognition. The events, stories, people, and history of White Alabama are far and away the most represented in Alabama’s public memory. Of the roughly 3200 historical markers, monuments, memorials, and museums in Alabama, an overwhelming majority of them are dedicated to stories and events relating to the experiences of White

people in Alabama. This is no coincidence however, as White people were the group to essentially establish public memory in Alabama. In 1880, the earliest marker recorded in the Historical Marker Database in Alabama was established, commemorating the Confederacy and its soldiers from the Civil War (Lang, Appendix AAN). In this section, I will explore and assess the rhetorical characteristics of historical markers relating to the experiences and stories of White people in Alabama, as well as provide insight into the implications of those characteristics on other racial groups and their public memory.

White history in Alabama, unlike that of Indigenous and Black history, does not suffer from a lack of representation or recognition, but in fact the opposite. As the dominant group, White people were creating a multitude of markers that portrayed the White experience. However, in order to ensure that as much history as possible was preserved and recognized, the markers began to not only recognize extraordinary events, stories, or individuals, but also the more mundane stories of any given area. As we know, historical markers are often found in places of rather critical historical significance such as the “Here Stood Rosa Parks” marker in Montgomery County, but in a way solely attributable to the public memory of White history in Alabama, much more typical stories came to be commemorated (Lang, Appendix AY). For example, the “McCurdy House” marker in DeKalb County denotes the home of a local land and store owner, but the marker does not give any mention about special significance of the house or individual

outside of his business acumen. This is characteristic of many markers that are found all over Alabama, in that many ordinary stories, events, or individuals are commemorated as a way to preserve and portray a certain view or understanding of history as it aims to center, perhaps solely, the White experience.

There may be another explanation, however, as to the seeming pervasiveness of historical markers dealing with the wide span of White history and the White experience. This historical and even rhetorical bias may find some explanation in the racial and ethnic makeup of Alabama itself. According to the 2019 United States Census, the White population of the entire state of Alabama was roughly 69.1 percent, even getting as high as 95.7 percent in some counties such as Cullman County (US Census Bureau). With these relatively high modern percentages of White population, and presumably even higher percentages in the past, it is not necessarily unreasonable to find much higher rates of public historic preservation and discussion of White history. However, this argument’s merit is lessened when you examine the pieces of history that the markers leave out or even alter. As will be explored in a later section, some of these markers paint a vivid picture of White history that very clearly leaves out vital pieces of that history that may have a connection to other groups outside of the dominant White group. Further than that, there are even some markers, memorials, and monuments that may have actively been created to alter public perception and understanding of certain historical events or groups. So, although the relatively high

percentage of White people and history in Alabama may explain some of the disparate rates of commemoration, it does not absolve them from intentional rhetorical alteration of some of those histories.

As a prime example of that intentional rhetorical alteration, one may turn their attention to the multitude of Confederate monuments and memorials all around the state. Although the Civil War, and thus the Confederacy, only lasted for a few years in the mid 19th Century, most of the monuments and memorials dedicated to the Confederacy were not built until the early 20th century. Just as we must examine the language used in these monuments and memorials, the temporal quality of their creation must also be examined. For example, the "Sumter County Confederate Monument" not only serves as a memorial to the Confederacy, but also deems them "Our Confederate Heroes" (Lang, Appendix AAH). This monument aggrandizes the Confederacy after their separation from, conflict with, and eventual loss to the United States Army, but it, like many others, was not built soon after the war, but was built much later in 1908. Therefore this monument, and others like it, are clearly not created solely for the commemoration of the losing side of the Civil War, so then must also serve a secondary purpose. This purpose is that of self-glorification and historical erasure under the guise of historic preservation. The creators of that monument, and those like it, through their language, word choice, and even timing are attempting to stifle negative ideas about the Confederacy and push a White centered, positive history of the Confederacy that fits

their narrative. As Casey established, "public place," "public presence," and "public discussion" are all vital to rhetorical strategy and public memory and being able to control those aspects of a monument can allow you to push an idealized view of history that plays into your narrative, while actively hiding or even changing the actual ways in which that history occurred (Phillips).

Black History

Black history and its stake in Alabama's public memory provides some of the most interesting dynamics in terms of both its rhetorical capabilities and historical implications. Although it is the racial/ethnic group that has been around for the shortest amount of time of the three groups being examined here, Black history is certainly some of the most turbulent of them. Black history in Alabama began with the slave trade and later evolved, spanning the Civil War and its end bringing about their freedom, to educational advancement for Black Americans, to the Civil Rights movement, and so much more. Black Americans have so much stake not only in the history of Alabama, but its creation as well. However, this vital impact is not always clearly seen in the events, stories, and individuals that are recognized in Alabama's public memory. In this section, I will explore the state of public recognition of Black history in Alabama's public memory by examining the rhetorical and practical methods through which Black stories and individuals are shown to the public. I will also examine the ways in which Black history was at times

intentionally stifled to make room for a different narrative of history, as well as how that aspect of the telling of Black history has improved over time.

As established, sometimes these historical markers often portray a view of history that minimizes and is even sometimes completely devoid of the impact of Black people in Alabama. The “Working on Walnut Street” marker in Dallas County serves as an example of the glossing over of Black history and impact in an area. This marker describes a street in the local town’s business district that operated as the district’s “working backside” where lower class citizens and “enslaved laborers” worked (Lang, Appendix X). Instead of actually acknowledging or understanding the conditions of those workers, the street itself, or examining the reasons that street became that way, the marker focuses on the story of an upper class, White woman who published a successful story set in the area. Coincidentally, the marker does acknowledge the irony of that story because “this dirty back street was not a place frequented by fashionable young ladies like Anna” (Lang, Appendix X). A prime example of the extreme end of this is the “Chantilly Plantation” marker in Montgomery County that commemorates a large plantation in the area (Lang, Appendix AY). The marker recognizes the owner of the plantation and how the plantation received its name, but does not acknowledge the impact, importance, or even existence of the slaves held there. Though this marker was created in 2015, this is often characteristic of much older markers, which makes its more modern occurrence even

more interesting.

Regarding that more common older practice of historical markers being devoid of or minimizing the impact of Black history, it is worth exploring the ways in which this has changed over time. From the appendix of historical markers, a clear distinction is made between the years when Black history began to gain traction and positive recognition in Alabama’s public memory. This positive recognition began around the 1980s, several years after the events of the Civil Rights Movement. As public perception and opinion of Black history began to spin more positively, so did the rhetorical methodology of their stake in public memory. For example, compared to the markers in the previous section, the “Smithfield” marker in Jefferson county accomplishes a strikingly different goal. The marker recognizes a local community that “was carved from the Joseph Riley Smith plantation,” and was a prominent Black neighborhood that “provides an exceptional view of the emergence of a Black white-collar class in the city” (Lang, Appendix AK). This marker directly and positively attributes the Black community’s influence on history in the area through the story of the creation of a burgeoning new neighborhood on land that was once home to enslaved people and showing the successes and contributions of the Black families that lived there. These types of stories and markers are more characteristic of more contemporary creation as they center strong Black experiences through their words and decisions of what stories and individuals to commemorate.

Although Black stories have gained

much more traction over time, there still remain very clear differences between Black history and the other histories we have previously explored in the realm of public memory. One of the main differences that can be observed is that, regarding Black history, the only stories that get told are those of rather extraordinary events, individuals, or circumstances. Compared to White history, as we have established, Black history does not have room in the public sphere to tell relatively mundane stories and are thus relegated to only commemorating things that have extraordinary qualities. For example, compared to the “McCurdy House” marker explored above, many markers telling Black stories are much more involved, such as the “Africatown” marker in Mobile County. This marker tells the story of a community that was created in the county by ex-slaves who came in on the last documented slave ship in the country as a “haven to continue practicing their traditional African culture” (Lang, Appendix AW). For the most part, many markers dealing with Black history must tell these extraordinary stories because they have been neglected for so long, both intentionally and unintentionally, that we do not have information on other, perhaps more mundane yet still important, Black stories.

3. Gender

As with race and ethnicity, gender also plays a key role in the understanding of history, and most importantly for our needs, how history is portrayed or represented in public memory. The historic theme of a

dominant group that controls and interprets history in a way that fits its own narrative also extends into the idea of gender as a factor of history. In the same way, with time that dominant group has loosened its tight grip on their single portrayal of history and have allowed for more stories to come to light. However, there still remains to be seen a lot of histories that exist outside of the binary of our understanding of gender in Alabama, which will be explored later.

In this section, I will explore the representative histories of different genders in Alabama’s public memory. This spans from male dominated, or masculine history, to women’s history, and even, as previously stated, histories of groups that may exist outside of the binary understanding of gender. These histories will be evaluated through the rhetorical qualities of their public commemoration in an attempt to understand both why and how these histories are and have been portrayed in certain ways.

Men’s History

Men’s history in Alabama nearly mirrors the growth and representation of White history throughout the state. This is because, as White history is the dominant group regarding racial or ethnic histories and representation, such is Men’s history with that of gender representation. Histories regarding or relating to the stories, experiences, and individuals of men or masculinity make up an overwhelming majority of the history represented in Alabama’s public memory through the historical marker system. There are a few reasons as to why this is the case, which will be discussed later. In this section, I will

discuss a variety of reasons explaining the dominance and fortitude of male centered stories as well as the way in which these stories are portrayed rhetorically and the types of implications those rhetorical devices can have on the portrayal of the histories of other genders.

Like that of White stories, the stories of men and masculine ideas span from the mundane to the extraordinary. This is because, as established, the dominant group of any category, in an attempt to control the narrative, must adopt a storytelling method that overwhelms the market of public history. To do this, stories of that dominant group, though they may be of relatively little public significance, gain a stake in the public memory of the area in which they reside. For example, the “McMahon House” marker in Lawrence County denotes the home of “a Virginia-born cotton factor who divided his time between Courtland and New Orleans” (Lang, Appendix AN). This is a characteristic of many markers throughout the state, as they tell the story of seemingly arbitrary local men, with the justification of other external factors such as the “architectural significance” of the building style, while centering the narrative around the homeowner instead of the home itself. This is not to say that the markers do not represent extraordinary men’s history, as there are plenty of markers that recognize exceptional achievements or experiences of men, such as the “Fitzgerald Home” marker in Montgomery County that recognizes the home of nationally acclaimed author F Scott Fitzgerald (Lang, Appendix AY).

Perhaps even more important than the mundanity of stories told, is the

masculinity of those stories. Though some markers may not be explicitly related to the male gender, such as stories of certain male individuals, there are many markers that represent strikingly masculine stories and styles of history. Throughout the entire state, there are many markers that represent classically masculine events or themes such as war, military exploits or sites, and other instances of violence. A prime example of the commemoration of this masculine style of history can be found in the “Ogly-Stroud Massacre” marker found in Butler County. This marker recounts an attack on a local family by the infamous “Savannah Jack” in which he attacked the home of a local family and killed all but two people there (Lang, Appendix G). Although an argument could be made about the relative importance of the public recognition of this story, there is no doubt that it takes on and, whether intentionally or not, perpetuates traditionally masculine historic themes that give credence to the pervasiveness of male dominated history throughout the entire state of Alabama. Through the rhetorical decision to commemorate the stories and experiences of men, both normal and extraordinary, throughout the state’s history, as well as the overrepresentation of traditionally masculine themes, the public memory of Alabama is undoubtedly skewed towards the remembrance of men and that can affect what histories of other genders are represented and the ways in which those histories are perceived by the public.

All of this representation does not go without some explanation though, as one of the key reasons why men’s history is so well represented in Alabama’s public memory is

because for a long time, men were the only ones allowed to participate in much of society. For much of America, and thus Alabama's history, men were solely in control of many aspects of society, especially publicly recorded society, ranging from military service, to governmental representation, to things like education as well. This quality is very explicit in many of the war memorials found throughout Alabama. For example, the "Armed Forces Tribute" memorial marker in Chambers County specifies its recognition and commemoration of "the men...who have served in the armed forces of our country" (Lang, Appendix I). This specification makes sense in a way, however, because men were the only ones allowed to participate in active duty or combat in the military. This alone, however, cannot completely account for the overrepresentation that men's history has throughout the state. As established, the above marker shows an interesting rhetorical choice because although women were not allowed to serve in combat for the military, women have long played a vital role in the successes and operations of the military. Clearly, this historical bias does not absolve the creators of these markers for their rhetorical choices of ignoring, sometimes partially and other times completely, the impact and influence of the stories of other genders.

Women's History

Women have undoubtedly helped shape Alabama and its history, though their recognition in the public mind may not always be representative of that. Women's

history, under the hand of the dominant male group, has been largely underrepresented and even intentionally misrepresented in public memory. Many stories of women and their experiences, for a large period of time, were either missing from public commemoration or purposefully minimized by those in the position to commemorate them. In this section, I will discuss the changes that occurred in the public representation of women's history in Alabama over time. Through this, I will examine the particular ways in which some of these stories are represented, and how that has affected the way women's stories have historically been understood as well as the ways in which that impacts more contemporary representations of similar histories.

In a similar manner to the stories of other groups subjugated by the dominant, narrative shaping group, Women's history has expanded as time goes on in both scope and count. As previously established, men's history is wildly overrepresented as a result of a few causes, but namely because they have long been the only ones able to participate in much of publicly remembered society. Recently, however, much higher rates of markers regarding women's history have been cropping up and portraying a slice of history that has been relatively inert. Some particularly minute and nuanced examples of this also relate to war memorials, as explored in the previous section. Once, memorials referred to "the men" who served, but in recent history, many of these memorials have opted for a change of language that is now more inclusive of all those capable of serving the

military. The “Veterans Monument” marker in Wilcox County that was constructed in 2010 serves as a good example of this more inclusive change as it signifies its honor of “all persons who have served in the nation’s armed forces” (Lang, Appendix AAN). A shift to more inclusive language signifies an interesting and intentional rhetorical change on the part of these marker creators. Not only does this noticable change come in the form of inclusive language, but also through the stories and experiences of more women in the public sphere than in the past.

As women were more freely allowed to participate in different facets of society, the types of stories and experiences that could be publicly commemorated that related to women grew as well. The normalization of things like the more frequent and higher education of women as well as their admittance into more prominent positions like government officials gave them a greater stake in public memory than ever before. The “City of Florence Walk of Honor” provides an amazing example of the growing surge of recognition of women’s history and the new ways in which that history is portrayed publicly. The Walk of Honor is a set of markers that are dedicated to numerous popular and important individuals and among the group are many women. There are markers dedicated to women like Lynn Middleton Sibley, who “developed a 21st century community-based model for maternal and newborn health in low-resource countries,” as well as Fran McKee, “the first woman line officer promoted to Rear Admiral in the U.S. Navy” (Lang, Appendix AAN). These stories and more encompass the new commemoration of

women and their stories and experiences that is unlike any other marker before. They fully portray those women and their accomplishments as wholly theirs, ensuring that the public who sees those markers attain the full gravity of those women’s achievements.

Unfortunately, as we know, markers that related to or told the stories of women have not always been so widespread, inclusive, and all-encompassing. In many older markers, the slight representation of women that did exist often portrayed them in relation to their role at the house or to their husbands. One example of this is found at “The J.D. Holman House” marker in Dale County (Lang, Appendix W). The marker briefly mentions Holman’s wife, Susan Dowling Holman as she relates to her husband, their children, and their home. Granted, there may have been no significant history or portrayal of her, but this marker simply serves as an example of the scattered, and usually simple, representation of women in any context before their more widespread and positive representation came about. There does exist, however, an interesting exception to this rule at the “Wildwood” marker in Madison County. This marker, created in 1958 well before the new wave of women-centered, positive representation, glorifies Virginia Clay Clopton, an “Author and Social Leader,” and even uses language that does not confer ownership of herself by her husbands, even when they were powerful men such as Clement Comer Clay, a “United States Senator from Alabama” (Lang, Appendix AS). These types of discrepancies display a very interesting dynamic in both the structure of some of

these markers as well as the intention of some of their creators regarding the way in which they choose to actively promote certain understandings of events or individuals.

Transgender/Other Gender History

Exploring the history of genders that exist outside of our binary understanding of men and women proves itself to be a complicated task. As far as has been examined, there exists no semblance of transgender history or history of other genders in Alabama's public memory with regard to its markers, monuments, memorials, and museums. This comes as no surprise, however, because, as a marginalized group of relatively recent societal acknowledgement, the track record of Alabama's public history recognition does not bode well for their contemporary representation. This is not to say that transgender individuals or those who identify with other genders have had no impact on Alabama's history, but that these stories, if they do exist, go entirely unnoticed or underrepresented.

This is, however, not a trend that we envision to last forever. As other marginalized groups have gained a larger stake in the public landscape of Alabama's memory over time, we suspect something similar to occur with these groups of marginalized gender identities. With the historic increased inclusivity of Alabama's public memory, the data leads us to believe that the stories and experiences of transgender people and other gender identities will be recognized and portrayed positively at some point in the future. In a

similar manner to the changes that we have already explored with Alabama's public commemoration of histories like Black history, women's history, and Indigenous histories, we suspect that as society becomes more inclusive so will the public commemoration of once forgotten or hidden stories and people.

4. Timeline

The timeline of public memory in Alabama spans over a century and has constantly been evolving and changing. In the early years of Alabama's public memory, the narrative portrayed was very much so homogeneous in its audience and muse. It told the stories of White men, both mundane and extraordinary, to the masses of White men willing to listen. As time progresses, however, we see striking changes being made to not only the types of stories being told, but also to their intended audiences. Through the growing inclusivity of stories of historically marginalized groups, Alabama's public memory has shifted into a state where it is more representative, but in a way also more segregated than it had been before. In this section, I will acknowledge and define some distinct periods in Alabama's public history and explore their key characteristics. Though, as evidenced in the Appendices, there are many markers for which there is no indication of the date of their creation, there are still some evident boundaries between eras of marker creation that are very telling.

Alabama's public memory essentially began in the late 19th Century, around 1880, as monuments and memorials

of events and people from the Civil War began to crop up. As established, this landscape was created entirely by and for White men. In other words, White men in Alabama who wanted to glorify themselves created the public memory landscape as we recognize it today. Public history sites such as the “Confederate Dead of Wilcox County” monument in Wilcox County and the “Alabama Confederate Monument” marker in Montgomery County which were created in 1880 and 1898 respectively, commemorate the events of the Civil War, which happened only roughly 30 years prior, though there are no earlier public markers that denote other types of history (Lang, Appendix AAN, AY). This segment of Alabama’s public history extends into the early 20th century as well, until about 1939. These first roughly 30 years of the 20th century are also marked by the rapid creation of markers, monuments, and memorials dedicated to individuals and events of the Civil War. These markers clearly center around the stories and experiences of White men, who were, and even still are, the dominant group of Alabama’s public memory. As we explore later years though, we will come to see the ways in which these commemorated stories change.

The next key segment of Alabama’s public history that we will explore is found in the mid 20th Century, from around 1940-1969. This part of Alabama’s public history is more or less defined by similarly characterized markers, although the form and method of their creation changed greatly. The markers still clearly centered around the stories and experiences of White

men, but instead of being created by fringe groups, a few state recognized historical groups and commissions were established that handled the creation of many markers for the purpose of public commemoration rather than personal vindication. The first of these was the Alabama Historical Association (AHA), created in 1947 and serves as “the oldest statewide historical society in Alabama” (Alabama History). This group has its hand in the creation of many markers all across the state as it attempts to commemorate stories through their “interest in Alabama history and a belief in its value for society today” (Alabama History). The other major group created was the Alabama Historical Commission (AHC), which was established in 1966 by Alabama Governor George Wallace (Alabama Historical Commission). This group has a little more stake in the physical realm of Alabama’s public history, as their mission is accomplished through “Preservation and promotion of state-owned historic sites as public attractions; and, statewide programs to assist people, groups, towns, and cities with local preservation activities” (Alabama Historical Commission). A key difference between these two groups is the AHA’s more heavy involvement with marker creation and the AHC’s stronger focus on these sites as public attractions such as museums. Due to this difference, many of these markers are more representative of the AHA and their narrative. This narrative, however, evolves and changes as time goes on, as we will explore in the following paragraphs.

The third well-defined era of Alabama’s public history is found in the late

20th Century, from roughly 1970-1999. This era is defined by the greatest change in both the content and form of these historical markers up to that point. The late 1970s and 1980s especially saw a great increase in the recognition of histories outside the White, male dominant group. This era saw markers created like the “Carrie A. Tuggle” memorial in Jefferson County, created in 1979, which honored the memory and accomplishments of Carrie Tuggle, a local, Black, female educator (Lang, Appendix AK). This change, while noticeable at the individual marker level, was also represented in the creation of branches of historical groups like those discussed above. In 1984, the AHC created the Black Heritage Council “to advocate and advise on the preservation of African-American historic places in Alabama” (Alabama Historical Commission). These types of inclusive change are very representative of this specific era, and put Alabama’s public memory on the track we see it today, telling the stories of more and more people than it ever has. These changes continue to occur, and even shape the next era that will be discussed.

The fourth and final distinct era of Alabama’s public history that will be explored is the contemporary era, spanning from roughly 2000 to the present day. The markers created in this era have been the most inclusive and representative of all the previous eras, providing the widest view of Alabama’s public history that has ever been seen. As established in previous sections, the history of long ignored or misrepresented groups have, over time, come to be not only more represented, but more accurately and

positively represented as well. A clear example of this change is the massive uptick in markers relating to stories, experiences, and prominent individuals of the Civil Rights Movement in locations significant to the movement. In addition to record levels of inclusivity, another defining characteristic of this era is that it holds the first examples of removal of history. This removal comes in the form of the taking down of markers and monuments such as Confederate monuments, in favor of a new, less glorified, and more accurate portrayal of history than that put forward by a dominant, self-glorifying, narrative-controlling group. These new events provide an interesting context to continue looking at public history through, as it is an entirely recent development and can completely alter the way in which we understand how history is recognized rhetorically and publicly.

Regarding the claim made at the beginning of the section, of Alabama’s public memory shifting from a homogeneous state to a more representative, albeit more segregated amalgam, there are some key characteristics that need to be evaluated. In this sense, segregation is more referential to the state of marginalized histories as only being a more recent development, as well as their telling of only exceptional marginalized stories. This new style of commemoration has unwittingly created a separation in the methods and types of storytelling that is represented throughout the state, although these methods and stories are now far more inclusive. It creates an interesting proposition to understand how, in an attempt to rectify misrepresentation and ignorance, instead of

bringing about unification, a new form of stratification has emerged.

5. Conclusion

Alabama has had a long and interesting history regarding the evolving state of its public memory and the rhetorical methodology behind that commemoration. It has many different facets, spanning years as well as topics and groups, with constantly changing perspectives. From its early years of mass commemoration and glorification of the stories of predominantly White men, to its more contemporary inclusivity and representation of marginalized stories, Alabama's public history has gone through drastic changes.

Alabama's public representation of its racial and ethnic makeup has seen Indigenous representation as centered around their experiences with White settlers, while also acknowledging possibilities of the causes of the lack of preservation of those groups. It has seen the continued focus on White groups, as they were and are the

dominant group that controls the historical narrative. It has also seen the misrepresentation of Black groups and, over time, the recognition and attempted reconciliation of the telling of Black stories.

In another aspect, Alabama's recognition of gender history has experienced these changes as well. The male-dominated and masculine form of history has long been the most represented because, as with White history, men's history also belongs to the dominant group. Women's history has come into light more contemporarily as they have gained more stake in society and its working over time. The histories of transgender and other genders, however, remains unrepresented, but hopefully as with other marginalized groups, as time continues we will see their stories come to light in the public sphere as well.

These changes, though pushing the envelope of diversity in Alabama's public mind through both content and form, have interestingly created a new style of stratification that permeates the new rhetorical landscape of public memory in Alabama.

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An Analysis of the History of Latin American and Caribbean Regionalism

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Abstract

The Latin American and Caribbean regionalism movement has produced an abundance of multilateral organizations. For some observers, the multiplicity of regional integration initiatives and the divergence of their ideologies complicates prospects for unification. For others, the diversity of organizations offers a “vote with your feet” alternative, which decreases the prospects for zero-sum interactions between nation-states. This paper covers the history of the Latin American and Caribbean regionalism movement up to its present state in 2020. Economic and political history are used to illuminate how the historical endowments, international relations, and ideologies of the region’s nations shape the growing diversity of regional integration approaches and the challenges this poses to the United Nations Commission for Latin America and the Caribbean’s (ECLAC) vision for complete regional unification. This paper adds a concise introduction to the study of Latin American and Caribbean regionalism and unique insights into the significance of Latin American and Caribbean regional integration in the context of modern globalization. The terms Contextual Realism and Grand-National Socialism are introduced as a means to better conceptualize the subject matter of this paper.

1. Introduction

As globalization continues to evolve, Latin America and the Caribbean (LAC) nations are strengthening their commitment to regionalism. Regionalism does not have a precise definition, but it is broadly understood as the development of multilateral institutions designed to accomplish collective economic, political, and social goals (Kissenger, 2002). The goals pursued by such organizations are diverse. They vary from seeking to enhance the member state’s positions in the global geopolitical arena, creating a bloc marked by transnational policy cohesion, enhancing social and political relations between member states, or increasing the region’s image to attract foreign investment, among others. Economic regionalism, the principal focus of this paper, can be defined as specific political commitments to reduce or eliminate the barriers between the free

circulation of goods, services, capital, and people (Gardini, 2012).

There are four standard levels of regional economic integration (Balassa, 1974; Malamud, 2019): free trade area, customs union, common market, and economic union. A free trade area is an arrangement that eliminates tariffs between member states but allows individual members to determine the tariffs they apply to countries outside of the bloc. A *customs union* is a free trade area with a common external tariff (CET) set by bloc members against countries outside of the organization. A *common market* is a customs union that allows for the free flow of capital and labor across borders. *Economic unions* are customs unions with supranational governing bodies which set binding monetary and fiscal policy within the bloc (e.g., the European Union). Regional

integration initiatives often serve social purposes, such as combating climate change and improving social equity, in addition to economic agendas. No two organizations are exactly alike, and the ends and means they pursue depend principally on the underlying ideologies of their member states. Some organizations do not fit neatly into the four aforementioned categories.

Modern capitalism is naturally an international system, but in recent years world production and trade have become increasingly interdependent through technological advancements, the advent and restructuring of multilateral institutions, and adjustments in the world division of labor. This interconnectedness offers developing nations the opportunity to participate in a growing number of markets. It also creates threats for countries on the periphery. Globalized markets are not only driving increases in gross world product (GWP) but are simultaneously reshaping the distribution of this growth between and within countries, often towards greater inequality (Nunnenkamp, 1996; Stiglitz, 2007). Leaders of the Latin American and Caribbean System (SELA) have expressed that it is “imperative to promote greater unity among Latin American countries to increase the bargaining power of the region and to ensure that Latin America occupies its rightful position in the international community” (Turner, 2001). Going at it alone is no longer an option.

The emergence of LAC regionalism may be defensive, offensive, or, more likely, both. *Classical realism* is an international relations theory which states that a nation’s interests are determined by its power

(Zakaria, 1999). Accordingly, as nations perceive increases in their relative power, they will act to expand their influence in global affairs. Viewed through this lens, the decline of American unipolarity in the new world order, and the relative power gained in LAC countries by the emergence of multipolarity, could be driving regional expansion. Political actors may also see the creation of regional organizations as a means by which to increase their short-run political capital, regardless of the efficacy of the organizations, and thus may act accordingly. Land-locked nations may view regional integration as a means to profit off of their coastal neighbors’ advantages. The drive towards regionalism might be understood in the classical realist sense as a means to seize opportunities for greater power.

On the other hand, *defensive realism* posits that states seek security rather than influence and so predicts that nations expand their interests only when threatened (Zakaria, 1999). The decline of American unipolarity, and the rise of a multipolar world order in its place, implies that countries can be left at a disadvantage in the global geopolitical arena if they do not band together and form strong coalitions. The hyperglobalist thesis posits that nation-states are becoming unnatural and even impossible to maintain in a multipolar system (Gwynne & Cristobal, 2014). Some even argue, as Katzenstein (2005) does, that we are approaching a world of regions. Such a reality would necessitate the creation of regional organizations for self-preservation, which aligns with the defensive realist view. Creating organizations for short-run political

capital could also be viewed as defensive if the politicians in question lack popular support. Weaker economic states may see regional integration as a means to combat the monopolistic forces of multinational corporate (MNC) expansion. It is likely that there are elements of both aggression and self-preservation in the drive towards LAC regionalism. Classical and defensive realism, taken by themselves, sometimes fail to capture the intricacy of a situation. Many events can be interpreted to fit either theory depending on perspective. International relations may be understood similarly to how humans and animals contextually act in aggressive and defensive manners. Combining both motives under the umbrella of what the authors of this paper call *contextual realism* is a more appropriate theoretical reference point.

The regionalism movement in Latin America and the Caribbean has spawned an abundance of multilateral organizations. Their size is largely attributable to their inefficacy. Despite the rhetoric about shared values and interests, LAC leaders have shown an inability to form a common regional stance on the environment, trade, democracy, and the like (Naim, 2014). As Di Bella (2017) points out, “the region is characterized by the coexistence of a plurality of regional initiatives that may hinder economic development in the absence of a coherent plan of regional scope”. Nevertheless, even though Latin American regionalism is marked by conflicting policies, disorganized authority, and disappointing performance, the institutions in charge of promoting it are flourishing. After several decades of failed

regional initiatives, there is a graveyard of irrelevant multilateral organizations. Most of these organizations remain actively funded and staffed with little more than a website to show for their efforts (Naim, 2014). This phenomenon is evident to the point that the situation is often described as a spaghetti bowl (Cornejo & Harris, 2007; Estevadeordal, 2002; Perales, 2012).

This paper seeks to answer the following questions: What historical events and global developments shaped the emergence of Latin American and Caribbean regionalism? What is the current state of LAC regionalism and who are its major power players? How are lessons from LAC regional integration attempts applicable to future decision-making in international relations? It is hoped that by understanding the origins, failures, and successes of LAC regional integration enterprises, practitioners and students alike may gain insight that will guide their thoughts and actions in socioeconomic relations. It is worth noting that generalizations about the LAC region as a whole fail to capture the nuances of each nation-state. Nevertheless, there are valuable insights to be gleaned from considering the region as a whole throughout its development.

2. A History of Economic Development in Latin America and the Caribbean

Origins

Understanding the current climate of LAC regionalism necessitates considering the events that led to its emergence. Latin

America (consisting of the countries in South and Central America, including Mexico) and the Caribbean are marked by exceptional biodiversity. Nearly half of the world's tropical forests are located in this region, along with abundant natural resources, including gold, oil, coffee, cacao, natural gas, bananas, &c (De Castro et al., 2016). This endowment shaped the economic history of the region's nation-states in two distinct ways.

First, the region's natural resource endowment provided entrepreneurs and governments an opportunity to take advantage of the cultivation, production, and exportation of unique primary products (natural resources extracted from the land) for economic gain. Indeed, the profitability of these products through exportation led most governments in the region to build their economic policy around the proliferation of external trade until the mid-twentieth century (Bulmer-Thomas, 2003). This model, known as export-led growth, played a crucial role in handicapping the development of industrialization in the region and exacerbating the inequality inherited from colonial rule (Stiglitz, 2007).

Second, while the lush landscape provided fertile ground for the cultivation and extraction of primary products, it also posed a substantial barrier to developing adequate infrastructure. With South America being divided by the Amazon Rainforest and the Andes Mountains, expanding infrastructure over large distances and across national borders proved expensive and challenging vis-à-vis areas such as the open plains of the American Midwest. Border disputes and

civil warfare also contributed to the dearth of investment in transborder infrastructure. The lack of proper roads, bridges, and electrical power led to production and transportation inefficiencies where substantial land barriers existed. Improvements in this regard were made over the last century, but even today, inadequate infrastructure is hampering the region's ability to grow and compete in the world market (Fay & Morrison, 2007; Lanau, 2017).

Latin America and the Caribbean is also situated in close proximity to the United States, which has offered economic opportunities and hindrances to sovereign autonomy. Since it emerged as a world power, the U.S. has maintained persistent efforts to influence the development of nation-states in the LAC region (Bulmer-Thomas, 2003; Chomsky, 1992; Stiglitz, 2007). The regionalism movement in LAC, as is explained in this text, is in some ways a means to regain economic and political autonomy from the United States and other special interests.

Export-Led Growth

In the century before the first world war, most Latin American and Caribbean countries followed a model of export-led growth based on the proliferation of primary products (Bulmer-Thomas, 2003; Conde, 1992; Thorp, 1998). The export-led growth model is a development strategy aimed at growing a country's gross domestic product (GDP) by focusing primarily on foreign markets (Palley, 2011). Economists at the time believed that an acute focus on primary-product exports would drive labor

productivity increases in the export sector, and thus, a rapid rise in total exports, exports per capita, and GDP. It was also thought that success in the export sector would drive productivity gains and capital accumulation in the non-export sector (Bulmer-Thomas, 2003). While the export-led model did achieve relative success during periods of commodity price booms, it is generally held to have inhibited LAC's economic growth relative to the rest of the developed world (Bulmer-Thomas, 2001; Bulmer-Thomas, 2003; Prebisch, 1962). This growth model left LAC nation-states overly vulnerable to commodity price shocks, created extensive balance of payments problems during recessions, dampened the incentives to innovate in the non-export sector, and exacerbated the inequality inherited from the time of colonial rule (Bawa, 1980; Bulmer-Thomas, 2003; Conde, 1992; Palley, 2011; Prebisch, 1962).

The region's natural resource endowment provided an excellent and tempting base on which to build this model. Many countries had comparative and absolute advantages in products that were widely desired by the West's elite, such as coffee and cacao. Due to a lack of proper infrastructure and the fact that they were not natural trading partners, Latin American and Caribbean countries directed a small proportion of their exports to other countries in the region. Thus, the export-led model was principally dependent on extra-regional exports to industrial hubs in the West. So much so that at the peak of the LAC export-led model in the 1920s, nearly 70% of all external trade was conducted with only four countries: the United States,

Germany, France, and Great Britain (Bulmer-Thomas, 2003). To make matters worse, most nation-states centralized their production around a few primary products. This lack of diversification within an already homogenous model of development accentuated the fiscal consequences during commodity recessions.

After LAC nations gained independence in the 19th century, their newly formed governments were tasked with addressing the fiscal revenue shortcomings brought about by the repeal of colonial taxes (Bulmer-Thomas, 2003). Direct taxes, such as income taxes and property taxes, were ruled out for the most part during this time because they were difficult to collect and easy to evade. With limited options and the immediate necessity of accumulating a fiscal base on which to build their newly independent states, governments in the region turned towards customs duties as their principal source of revenue. Export-led growth became not only a means to fuel GDP growth but also the primary source of government finance.

During commodity price booms, LAC governments reaped tremendous sums of revenue from customs duties. Many of the potential long-run gains to be realized from this surplus revenue failed to materialize, however, as governments pursued procyclical fiscal plans during booms and largely failed to invest in industries outside of primary-product sector to mitigate cyclical risk. The result was a dearth of finance available to service debt payments and remedy balance of payments problems during commodity recessions which led to economic woes which might have been

avoided had countercyclical discipline or diversification been implemented (Bulmer-Thomas, 2003).

Three global shocks - World War I, The Great Depression, and World War II - illuminated the disadvantages of excessive dependence on primary-product demand for economic growth. During the wars, strategic minerals used for military production (e.g., oil and rubber) boomed while commodities dependent on consumption (e.g., coffee and bananas) fared quite poorly (Thorp, 1998). Some countries weathered the war recessions better than others, depending on their endowment from the commodity lottery. The Great Depression, on the other hand, affected every country. The drop in commodity prices during this time was so severe that from 1928 to 1932, nine countries saw the unit value of their exports fall by more than 50%, and the region as a whole saw its net barter terms of trade (NBTT) collapse by nearly 48% (Bruton, 1998; Thorp, 1998). Falling customs duties from these shocks produced a severe balance of payments problem for many nations as capital flowed out of their borders. This capital shortage led to widespread debt and default (Bulmer-Thomas, 2003).

Three global shocks in relatively short period of time produced a common message throughout the region: it was risky to rely on a narrow range of primary-product exports and the importation of vital goods for economic expansion (Thorp, 1998). Following its inception in 1948, the United Nations Economic Commission for Latin America and the Caribbean (ECLAC - one of the five regional commissions of the United Nations) began publishing reports

predicting that the prices of primary products would fall relative to that of industrial goods in the long-run. Such predictions implied that countries principally relying on these products for economic growth would see their NBTT continually decline over time (Baer, 1972; Bulmer-Thomas, 2003; Prebisch, 1962; Van Klaveren, 2017). In conjunction with the rise of nationalism and the pessimism born out of the volatile events of the previous decades, these reports led most LAC nations to explicitly abandon the export-led model for import-substitution industrialization (ISI) by the late 1950s (Bulmer-Thomas, 2003; Thorp, 1998;).

The view that the export-led model was an outright failure neglects to recognize the benefits it generated in the form of widening domestic markets, construction of infrastructure, and facilitating the importation of capital goods for new domestic industries (Conde, 1992). However, the LAC nations failed to diversify their exports beyond a narrow range of primary products. This lack of diversification led to inequality in the distribution of domestic profits and a significant capital drain from transnational companies (Bulmer-Thomas, 2003). This is not to say that the export-led model in itself is a bad strategy for growth. When accompanied by the appropriate focus and policies, the export-led growth strategy has been successfully used to generate economic growth in many countries.

In recent years, China and the Asian Tigers (Hong Kong, Singapore, South Korea, and Taiwan) achieved unprecedented success pursuing export-led growth (Stiglitz,

2007). There are, however, two stark differences to the Asian approach. First, primary products in the Asian approach, make up a significantly smaller proportion of total exports compared to the LAC models. Instead, Asian countries are focusing on manufactured exports which enjoy more stable prices and demand. Second, Asian countries are restricting their capital flows to prevent short-run speculative capital from flooding into countries and flooding out at the first sign of panic (this policy was relaxed before the crash of the late 90s following the IMF's endorsement of the lifting capital flow restrictions and subsequently reinstituted after the crash) (Stiglitz, 2007). China and the Asian Tigers fund a greater amount of their investment from domestic savings, compared to LAC's reliance on foreign investment during their export-led experiment, and thus have kept a greater amount of the returns within their borders and enjoyed greater stability during recessions (Stiglitz, 2007).

By relying on exports with more stable prices and limiting the volatility of their domestic economies through capital flow restrictions, China and the Asian Tigers demonstrate that the export-led model can be effective when accompanied by the appropriate policies. Unfortunately for LAC nations, these adjustments were mainly not implemented, and instead, many in the region turned inwards at the same time the rest of the world began to turn outward (Bulmer-Thomas, 2003).

Import-Substitution Industrialization (ISI)

Following the recessions in the first half of the 20th century, the view that a more or less free market would solve the LAC development problem was challenged by prominent economists of the structuralists school who advocated instead for inward-looking development (Baer, 1972; Bruton, 1998; Prebisch, 1962; Irwin, 2021). This rejection of liberalization principally stemmed from the idea that underdevelopment results from structural dependency (Prebisch, 1962). The dependency spoken of by the structuralists was manifest in the relationship of LAC nations to industrialized economies, and especially MNCs. Even though dependency theory could not be empirically proven and was later shaken by the unprecedented success of the Asian Tigers, it contributed to the rise of the ISI model in LAC countries (Van Klaveren, 2017).

Under the leadership of Raúl Prebisch, ECLAC published reports predicting that productivity gains by MNCs in industrialized countries would result in higher wages instead of lower prices (ECLAC, 2015). Assuming industrial productivity gains outpaced those in the agricultural and primary-product sectors, real wages in the industrialized countries would continually outpace those in developing countries. Thus the structuralists concluded that the productivity gains in industrialized countries would continually widen the disparity in net barter terms of trade (NBTT) in favor of developed countries in the long run (Bulmer-Thomas, 2003; Bruton, 1998; Van Klaveren, 2017).

Continuing to rely on primary-product exports as the principal source of economic growth, it was thought, would relegate LAC nations to a permanent seat on the periphery. The threat posed by the possibility of a third world war emerging out of the Cold War tensions helped to buttress the view that LAC countries should turn their focus inward and lessen their dependence on external variables for economic growth.

Import-substitution industrialization (ISI) is an economic development strategy that seeks to replace imports (principally manufactured ones) with domestically produced goods. Countries pursuing this model seek to lessen their country's dependence on external variables and create a more self-sustaining economy. Protectionist measures to reduce imports (tariffs, quotas, or outright prohibitions) and subsidies to local industries are combined to encourage the establishment of domestic firms to accomplish this end (Baer, 1972; Bruton, 1998). The demonstrated vulnerability of the export-led model experienced during the first half of the 20th century, pessimistic predictions regarding the long-run terms of trade for primary-products exporters, and the rise of nationalism contributed to the adoption of the ISI model by many LAC nations. ECLAC and its sympathizers believed this inward-focused shift would provide a measure of stability absent in the export-led growth model and bring LAC industries into competitive parity with the rest of the developed world. While the ISI model did contribute to the development of industry in many LAC nation-states, its overall results are underwhelming, and by the late 1960s

support for the ISI model was waning (Baer, 1972; Bulmer-Thomas, 2003; Bruton, 1998; Irwin, 2021).

During the World Wars, many larger LAC countries (Argentina, Brazil, Chile, Columbia, Mexico, and Uruguay) built up a significant industrial base which by the 1950s had either become or was soon to become the leading sector in their economies (Bulmer-Thomas, 2003). Given their progress towards industrialization, ECLAC's theoretical justification for inward-looking policies seemed practical. However, the policies accompanying the ISI model in these countries hindered its efficacy and led to disappointing performance, despite the significant industrial progress made prior to implementation (Bruton, 1998). As Irwin (2021) describes, "rates of tariff protection were high and variable across industries for reasons unrelated to any apparent economic logic, small and inefficient firms were created that served only domestic markets, and taken together such policies became an obstacle to promoting exports". Reliable economic data was scarce in the 50s and 60s, which meant governments had to make many policy decisions based primarily on theory (Bruton, 1998). Compounding this handicap was the fact that many essential principles of effective protectionist policy that are known today (value-added protection, the advantages of a reasonably uniform tariff, and real exchange rates) were not well understood by economists at the time (Bruton, 1998). Policies in these nations were riddled with inconsistencies and applied ad hoc principally to address balance of payments problems instead of

strategically protecting domestic industries with the most substantial potential for generating comparative advantage (Baer, 1972).

The high rate of protection offered to domestic industries was expected to stimulate domestic investment in the capital and intermediate goods sectors which were deemed principally crucial to developing the ISI model (Bulmer-Thomas, 2003). A lack of access to adequate finance and technology in the domestic economy proved limiting, however, and many governments relaxed their restrictions on capital flows and turned to foreign investment to drive expansion in these sectors. Multinational corporations (MNCs) provided much of this investment. Contrary to the expectation of the LAC governments, however, many MNCs found the capital and intermediate goods sectors less profitable than the consumer goods industries. Instead of investing and innovating in these desired industries, MNCs began to buy up existing domestic firms and drain profits out of the region which were previously retained domestically (Bulmer-Thomas, 2003).

Still in need of capital and intermediate industries, governments in the region turned to the creation of state-owned enterprises (SOEs) to sustain the industrialization program in heavy industries such as steel and automobile manufacturing (Baer, 1972). Accompanied by policies that shielded SOEs from foreign competition, the result was high cost and inefficient production, riddled with underutilized production capacity and failing to take advantage of economies of scale (Bulmer-Thomas, 2003). The same

problems plagued the private sector industry. The failure of the private sector industry to take advantage of economies of scale, combined with the inadequacy of transportation infrastructure, contributed to the development of regional oligopolies, which furthered the development of inefficiency and inequality (Bulmer-Thomas, 2003; Sachs, 2006).

The failure to develop a sufficient amount of efficient intermediate and capital goods manufacturing capacity implied that other firms which relied on these products in their production had to import them (Irwin, 2021). The protectionist policies accompanying the inward-looking model drove up the effective price of these imports, which caused firms that relied on imports for production inputs to produce output at costs too high to compete in foreign markets. For example, in an ideal domestic ISI system, an Argentine automobile manufacturer can source all of the inputs for his production from within the Argentine economy. When Argentine state-owned steel enterprises fail to develop efficient production, the Argentine automobile manufacturer is left no choice but to import his steel. Thus he is taxed on the front end for importing his steel and on the back end when he exports his finished product. Assuming our Argentine automobile manufacturer manages to achieve economies of scale comparable with those of his competitors around the globe, he is still rendered uncompetitive by the excessive taxation he faces from a failing ISI economy.

Protectionism also stifled traditional primary-product exports in these countries

as they still had to compete in the world market with the same products sourced from more open economies. This situation created trade deficits, leading to the extensive balance of payments problems that plagued the domestic ISI model (Bulmer-Thomas, 2003). The options governments had to remedy these balance of payments problems were costly. Cutting imports implied cutting the resources necessary for intermediate and capital goods production and further stifling the ISI model in the process. Monetary expansion and foreign loans were often reluctantly turned to, bringing economic dependence, inflationary pressure, exchange rate instability, and fiscal deficit (Bulmer-Thomas, 2003).

The other LAC nations (Bolivia, Peru, Paraguay, Cuba, Venezuela, &c) that failed to accumulate significant industrial momentum during the war years doubled down on export-led growth. Though these countries did not explicitly opt for ISI, they increased their economic protection to protect their domestic agriculture and handicraft sectors (Bulmer-Thomas, 2003). These export-led economies experienced similar balance of payments problems due to high tariffs and declining NBTT for primary product exports (Irwin, 2021). The region as a whole was the most protected in the world during a time when adherents of the General Agreement on Tariffs and Trade (GATT) were rapidly lowering their trade barriers for manufactured goods; this did not create the conditions for sustainable economic growth (Bulmer-Thomas, 2003). By the late 1950s, dissatisfaction was rampant throughout the region. Although GDP had broken free of its wartime stagnation during the ISI period,

social equity suffered in the process (Bruton, 1998). The LAC region had one of the most inequitable wealth distributions globally, and both the ISI and export-led economies were falling short of expectations (Bulmer-Thomas, 2003).

3. Latin American and Caribbean Regionalism: Old, New, and Postliberal

Old Regionalism

In the late 1950s, many economists began documenting the disadvantages of protectionist policy and advocating instead for a more outward-looking focus (Irwin, 2021). Their position is well-explained by Scitovsky (1969):

Protection usually confines the protected manufacturer to the domestic market and so inhibits the exploitation of economies of scale, especially in small countries and in industries where scale economies are important and call for very large-scale operations. Moreover, governments anxious to secure the benefits of competition often encourage many firms to enter industry in order to create domestic competition where protectionist policies have suspended foreign competition. The result, however, is contrary to what is aimed for, since such government policy restricts the scope for economies of scale yet further and often leads to the emergence of too many firms, each with too small an output

capacity, and frequently with too small a market to utilize fully even that capacity.

Some economists used this idea and suggested that the problem posed by the scarcity of domestic demand could be solved by removing protectionist policies applied to neighboring LAC countries but keeping them in place for nations outside of the region. This model, it was thought, would foster intra-regional trade, which would allow the ISI model to reach the potential previously predicted by its proponents (Van Klavernen, 2017).

In the 1960s, ECLAC revised its original stance on ISI to include calls for a LAC economic bloc with intra-regional trade liberalization (ECLAC, 2015). ECLAC's influence in the region was significant, and most governments adapted their policies in tune with this assessment. ECLAC's influence was the sole factor in these decisions. The spread of ISI created powerful interest groups who stood to benefit from its continuation and strengthening (Bulmer-Thomas, 2001). Regional ISI momentum also came from nationalist sentiments, which developed in the wake of the volatility of the previous decade and the threat posed by a protectionist Europe (Barbieri, 2019). This form of regional cooperation marks the first wave of modern regionalism pursued in LAC countries and is known as "old regionalism" (Barbieri, 2019; Bulmer-Thomas, 2001; Moncayo et al., 2011).

Old regionalism was essentially an attempt to carry out ISI at a regional level

(Bulmer-Thomas, 2001; Heine, 2012). The first forms of LAC old regionalism were manifest in the Latin American Free Trade Agreement - LAFTA - (1960), Latin American Free Market Association - ALALC - (1960), and the Central American Common Market - CACM - (1960) (Heine, 2012; Moncayo et al., 2011; Van Klaveren, 2017). These trade agreements, comprising the genesis of the "spaghetti bowl", had one thing in common: intra-regional liberalization, and principally in the manufacturing sector. Tariffs for non-manufactured goods remained high between LAC countries, and tariffs applied to countries outside the region remained high across all industries (Bulmer-Thomas, 2001).

Regional ISI was plagued by the same problems that hindered the domestic model: firms remained high cost and incapable of exporting to the rest of the world, the domestic markets were insufficient to fuel the growth of the region, and countries continued to be plagued by balance of payment problems as a result of trade deficits (Bulmer-Thomas, 2001). Excessive foreign aid and expansionary monetary policy over the decades of old regionalism set the stage for the worst financial crisis in many LAC nations since the Great Depression (Delvin & French-Davis, 1994). When the IMF and other multilateral institutions began cutting their loans to LAC countries, a series of defaults were triggered in the region known as the debt crisis of the 1980s. LAC nations were forced to generate trade surpluses to pull themselves above water rapidly. Both extra-regional and intra-regional imports

were cut, and regional integration movements suffered as a result (Bulmer-Thomas, 2001). The debt crisis, and the “lost decade” of disappointing economic growth that followed in LAC, marks the end of old regionalism (Delvin & Ffrench-Davis, 1998). It was not until the end of the Cold War that a new wave of Latin American and Caribbean regional integration emerged.

New Regionalism

The international economic and political systems underwent dramatic systemic restructuring following the completion of the Cold War in 1991 (Barbieri, 2019). Socialism and central planning were dealt a fatal blow following the collapse of the Soviet Union, and market-oriented policies became predominantly regarded as the future model for global development. Protectionism fell out of style worldwide and was usurped by the neoliberal principles of trade liberalization and multilateral cooperation. These reforms, which were loosely dubbed the “Washington Consensus”, aimed at reducing balance of payment problems, curbing inflationary pressures, opening markets worldwide to international trade, and deregulating the flow of capital (Edwards, 2008). The Washington Consensus was endorsed by the International Monetary Fund (IMF) and the World Bank as a condition of aid which played a significant role in the adoption of such policies in LAC nations and other developing countries. Though they varied in the methods and degree of adoption, countries on the periphery were largely

strong-armed into adopting a cookie-cutter set of development policies that often neglected to consider the nuances of their particular situations and often favored the interests of MNCs (Naim, 2000; Sachs, 2006; Stiglitz, 2007).

LAC integration efforts during the 1990s contrasted sharply with previous old regionalism attempts (Van Klaveren, 2017). New regionalism, or open regionalism as it is commonly referred to, does not seek to promote ISI nor require acute protectionism against countries outside the region. It is not limited to the manufacturing sector, nor does it discriminate against extra-regional exports (Bulmer-Thomas, 2001). Instead, new regionalism movements seek to gain strength in the international marketplace through cooperation and economic openness (Barbieri, 2019).

In 1994 ECLAC coined the term “open regionalism” to describe this new phenomenon. As described by ECLAC (1994), open regionalism is:

a process of growing economic interdependence at the regional level, promoted both by preferential integration agreements and by other policies in a context of liberalization and deregulation, geared towards enhancing the competitiveness of the countries of the region and, in so far as possible, constituting the building blocks for a more open and transparent international economy

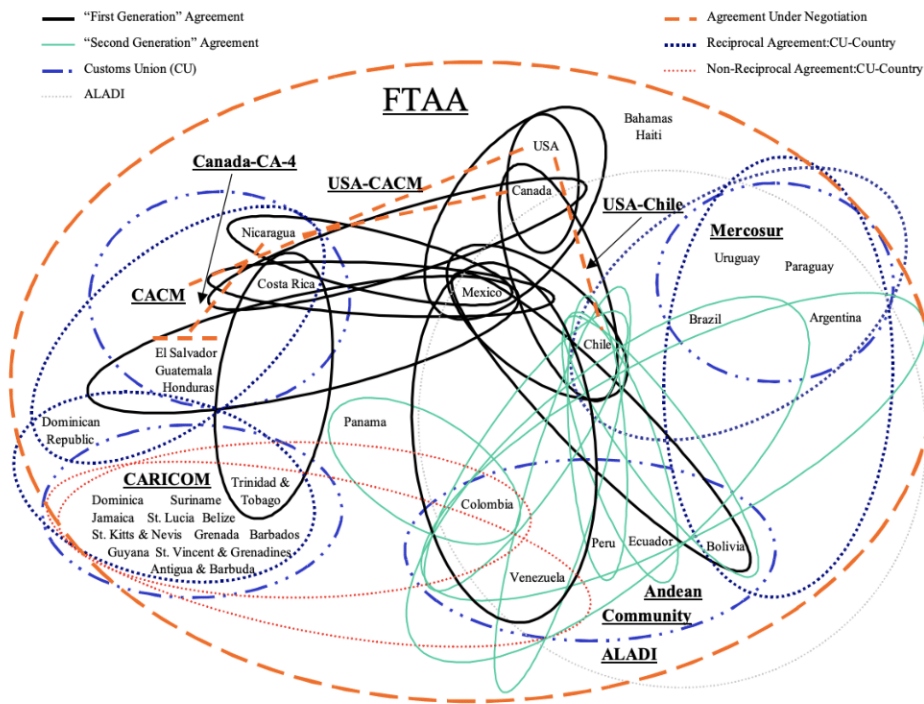
Whether it is described as open or new regionalism, there is a clear difference between the regionalism emerging in the 90s

and that of the preceding decades. After the Cold War, the changing nature of the global geopolitical and economic arenas necessitated that developing countries band together to form regional coalitions. Going at it alone would not cut it anymore, and all LAC countries, except for Cuba, embraced the open regionalism movement (Gardini, 2015).

The drive towards new regionalism led to the revival and reimagining of defunct multilateral organizations and the creation of new ones. The Central American Common Market (CACM, 1960), the Andean Community of Nations (CAN, 1969), and the Caribbean Community (CARICOM, 1973) were re-envisioned to embody the changing nature of the world order by dropping their focus on regional ISI in favor

of neoliberal ideology (Barbieri, 2019). The Southern Common Market (Mercosur, 1991), the Association of Caribbean States (ACS, 1994), the Pacific Alliance (PA, 2011), and others were among the new projects and important milestones in the development of new regionalism (Heine, 2012). In addition to these institutions, there was an abundance of bilateral trade agreements, regional scope agreements, partial scope agreements, and various other kaleidoscope agreements signed between nations in the region (Baquero-Herrera, 2005). It was during this period that the “spaghetti bowl” became increasingly convoluted. A figure in a report authored by Estevadeordal (2002) attempted to capture the growing complexity of the situation:

Figure 1. Trade Agreements Signed and Under Negotiation in the Americas



Since Estevadeordal's graphic was published, the relationships between LAC countries and multilateral institutions have become increasingly convoluted. The Andean Community of Nations (CAN) still exists, but its members formed another group in 2011, the Pacific Alliance, which now is the leading organization amongst its members. Political pressures often make it challenging to vacate existing organizations even after their influence has ceased to be relevant. Thus, the pattern of creation, decay, and creation has played out repeatedly without reasonable attempts to consolidate the multiplicity of LAC regional organizations and their functions (Di Bella, 2017; Malamud, 2019). The key takeaway here is that the Latin American and Caribbean regional integration initiatives lack the organization and cohesion necessary for a unified movement.

Too many regional projects are created to develop short-run political capital and are quickly replaced but not abolished when they fail to accomplish their ends. Many LAC leaders also view multilateral institutions solely as a means to further their national interests and are not committed to the vision of a unified region, which hinders the efficacy of such institutions. Despite these factors, Mercosur and the Pacific Alliance are two organizations born out of the new regionalism movement which managed to rise above the rest of the spaghetti bowl in terms of efficacy and global influence. These organizations now compete and cooperate with a wide array of other organizations born out of the postliberalism movement, which further complicates the prospect of unification.

Postliberal Regionalism

The regionalism of the 90s was at first seen as a complement to the Washington Consensus policies, but this began to change following the failures of neoliberalism around the world. As British economist Alfred Marshall once said, short words are usually lousy economics. In many countries, neoliberal market reforms led to previously unseen price stability and even economic growth. Soon, however, it became clear that there were limits to how far opening up, privatizing, and deregulating their economies would take developing countries towards the development of equitable and sustainable growth.

Between 1994 and 2002, many middle-income developing countries (including Argentina, Mexico, and Chile) experienced significant financial crises following their implementation of neoliberal macroeconomic policies (Sitglitz, 2007). Supporters of the Washington Consensus quickly pivoted and blamed the countries in question for lacking the proper institutional framework to facilitate the success of neoliberalism. Although these arguments may hold some merit, they nevertheless fail to account for the fact that what may work in one country may not work in another, and what may work in one country at one time may not work in the same country at a different time. Furthermore, what may work in a developed country may not work in a developing country (Cypher, 2008; Stiglitz, 2007). Unfortunately, there is yet no universal blueprint that will drive economic prosperity in the volatile global economy in any country at any time.

Towards the end of the twentieth

century, the failure of Washington Consensus policies to foster equitable and sustainable growth in LAC nations culminated in growing dissatisfaction with the neoliberal status quo. Center-left politicians rode this wave to power in the late 1990s and early 2000s, which profoundly impacted the regionalism movement in LAC countries (Briceño-Ruiz, 2014; Tussie, 2014). The rise of populism brought anti-US sentiment and a drive for greater autonomy in regional destiny. This political shift marks the genesis of postliberal regionalism.

Postliberal regionalism, sometimes referred to as posthegemonic regionalism, is driven by a desire for greater autonomy in economic development, particularly from the hegemony of the United States and other special interests (Briceño-Ruiz, 2014; Sanahuja, 2012). This quest for autonomy is manifested in the strengthening of the state, the reversal of privatization (particularly in essential services such as energy, water, and communications), increases in social expenditures, and distancing from neoliberal institutions such as the IMF (Tussie, 2014). Regionalism in the postliberal model is no longer driven by the first principle of economic liberalization but by political cooperation and calls for social equity. Economic and security concerns are now intertwined with initiatives for social justice and public goods such as infrastructure and health care (Peterson & Schulz, 2018).

Projects such as the Bolivarian Alliance for the Peoples of Our America (ALBA-TCP, 2004), the Union of South American Nations (UNASUR, 2008), and the Community of Latin American and

Caribbean States (CELAC, 2010) were built on postliberal principles as an alternative to the neoliberalism of the Washington Consensus and its adherents (Gardini, 2015). Other institutions that were created under a neoliberal ideology, such as Mercosur, began reshaping their priorities to include postliberal principles. Other organizations, such as the Pacific Alliance, maintain a commitment to neoliberalism. Thus, the emergence of postliberal regionalism does not mark the end to the new regionalism era, but rather a fragmentation of LAC regional integration ideology.

A distaste for multinational corporate hegemony in the globalized world drives postliberal regionalism. Efforts by nation-states to isolate themselves from MNC influence run the risk of missing out on the poverty alleviation potential these corporations have generated for millions of people. Since 1990 there has been an over 500-million-person reduction in the number of extreme poor in China and India. This unprecedented shift in well-being is primarily due to the liberalization programs these countries have implemented since 1990 (Sachs, 2006). The Covid-19 pandemic demonstrates, however, that isolation from globalization has its advantages. As quarantine efforts disrupted trade routes across the world, countries with more domestically geared production and consumption were better positioned to mitigate the threat posed by a reduction in the volume of world trade. Scholars should continue to monitor postliberal economic initiatives relative to their more pro-globalization counterparts.

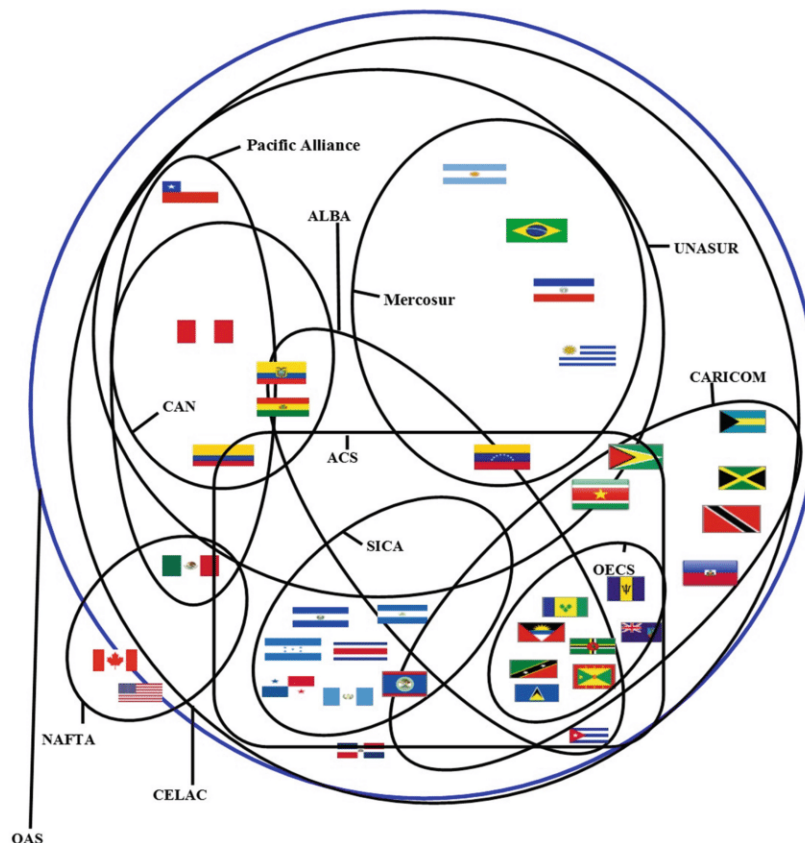
4. Conclusion

This sought to answer the following questions: What historical events and global developments shaped the emergence of Latin American and Caribbean regionalism? What is the current state of LAC regionalism and who are its major power players? How are lessons from LAC regional integration attempts applicable to future decision-making in international relations? How are lessons from LAC regional integration attempts applicable to future decision-making in international relations?

The path to LAC regionalism is marked by numerous stages of economic development strategies. This paper examined the stages of export-led growth, import-substitution industrialization (ISI), old regionalism, new

regionalism, and postliberal regionalism. The region's countries exhibited a relative cohesion in their approaches to economic development until the beginning of the twenty-first century. With the emergence of postliberal regionalism came a major split in the visions for the region's development.

There is currently a broad agreement that regional integration can help the LAC region adjust to and thrive in the new globalized world, but that is about as far as agreement on the subject goes. Years of new regionalism and postliberal regionalism spawned an abundance of multilateral institutions. Many nation-states are members of several regional organizations that espouse conflicting ideologies and goals. A figure in a recent paper by Selleslaghs et al. (2020) captures a condensed picture of the current state of the “spaghetti bowl”:



This graphic does not include all of the irrelevant organizations which are still funded and staffed. To do so would inhibit meaningful interpretation. ECLAC's hope for a coordinated and unified regional integration is far from attained. Institutions such as the Organization of American States (OAS), the Union of South American Nations (UNASUR), and the Community of Latin American and Caribbean States (CELAC) include in their membership all of the LAC nation-states. However, these organizations play an essentially theatrical purpose and lack any substantial ability to unify the region's interests. Notwithstanding this, the region's three dominant blocs, Mercosur, the Pacific Alliance, and ALBA-TCP have made meaningful progress towards regional integration, albeit in very different ways.

The Pacific Alliance (Chile, Columbia, Mexico, and Peru) remains committed to a new regionalist ideology, as demonstrated by its focus on trade liberalization intra-regionally and with the rest of the world. Central to its initiative is the free circulation of goods, services, capital, and people within the bloc, while socially redistributive initiatives take a comparatively secondary role (Perry & Auvert, 2016). The Pacific Alliance remains friendly to the United States and other developed countries in trading and foreign investment relationships.

ALBA-TCP (Venezuela, Cuba, Bolivia, Saint Vincent and the Grenadines, Saint Lucia, Grenada, Saint Kitts and Nevis, Antigua and Barbuda, Dominicana, and Nicaragua) embodies postliberal socialist ideology in direct opposition to

neoliberalism and in direct contrast to the Pacific Alliance. Its origins grew out of a dissatisfaction with western capitalism, and its leaders view state-led solutions to social problems as appropriate in a globalized world. The foundational document of ALBA-TCP, *Joint Declaration Venezuela-Cuba*, explains the dissatisfaction with the West and the reasoning behind the bloc's formation as follows:

We wish to draw attention to the fact that the Free Trade Area of the Americas (FTAA) is the most blatant expression yet of a hunger to dominate the region and, were it to come into effect, it would mark an intensification of neoliberalism and create unprecedented levels of dependence and subordination. We have made an historical analysis of the integration process in Latin America and the Caribbean and we find that, far from responding to aspirations of independent development and regional economic complementarity, it has acted as a mechanism to increase dependence and foreign domination. We also find that the profits obtained over the last five decades by the big transnational companies, the weakening of the import substitution model, the foreign debt crisis and, more recently, the spread of neoliberal policies coupled with a greater trans-nationalization of Latin American and Caribbean economies and with the proliferation of negotiations to reach free trade agreements like the FTAA have set

the foundations which give rise to the scenario of subordination and backwardness plaguing our region today (Portal Cuba, 2004).

ALBA-TCP is committed to the (re)nationalization of natural resources, the creation of nationally owned enterprises, and the fundamental role of the state as the principal economic actor (Aponte García, 2013). ALBA-TCP embodies a form of economic organization never before seen on the world stage. Leaders of the bloc are developing collective initiatives known as Grand-National Enterprises (GNEs), Grand-National Institutes (GNIs), and Grand-National Projects (GNPs). These ventures seek to counter the hegemony of western capitalism by limiting MNC participation in the ALBA economy in favor of bi/multi-nationally owned services (Muhr, 2011). GNEs, GNIs, and GNPs exclude ownership to those except the governments of ALBA-TCP members.

ALBA-TCP is seeking to achieve what appears to be a new form of socialism, which we refer to as Grand-National Socialism. *Grand-National Socialism* is defined as the ownership of the means of production (i.e. socialism) by a multi-state organization, or a subset of its members, formed to achieve collective goals (i.e. Grand-National). This model of socialism differs from the traditional concept by replacing the national ownership of production with multi-national ownership. Scholars should continue monitoring the development of this organization as its unique form of collective economic ownership seeks to fulfill a vision of

socialism never before implemented.

While developing out of the new regionalist movement, Mercosur (Argentina, Brazil, Paraguay, Uruguay) has adapted to add postliberal humanitarian policies to its agenda and sits ideologically between the Pacific Alliance and ALBA-TCP. Thus, regionalism in Latin America can be thought of as developing on three separate axes: neoliberalism, postliberalism, and revisionist hybridism (Briceño-Ruiz, 2014).

The proliferation of regional integration organizations and the diversity of their ideologies is creating a complex puzzle for those who hope to see a unified region. Some scholars posit that the multitude of regional organizations is a positive reality as it allows countries to pick and choose their membership to fit their national interests. It is argued that this allows nation-states to avoid zero-sum interactions with their regional peers (Gardini, 2013). Others (Malamud, 2019) maintain that the excessive number of LAC regional organizations and the incongruity of their ideologies prevent the countries in the region from taking full advantage of regional integration. The multiplicity of integrationist initiatives causes nation-states to hold loose commitments to several organizations simultaneously. Though Venezuela is currently suspended from Mercosur for undemocratic actions, they were a member of both this organization and ALBA-TCP from 2004 to 2016. Mercosur and ALBA-TCP espouse very different ideological positions, and simultaneous membership creates incongruity in national priorities and undermines the organizations themselves by the presence of loosely

committed members.

Several lessons for international relations decision-making emerge in the study of LAC regional integration. Future decisions should not be based on theory or data alone. Historical context is an essential factor that cannot be ignored when formulating development strategies. Developed countries must be aware that the cultural, historical, and economic realities abroad dictate that nuanced perspectives be applied in interactions with other nations. The historical success of a development strategy must not be taken for granted as an ideal means for future growth. As our planet and its inhabitants continually evolve new challenges and capabilities, our development paradigms must be continually reassessed and realigned to fit with society's present and future needs.

The development of LAC regionalism provides abundant opportunities for future cross-disciplinary research. As the region's three prominent organizations - Mercosur, the Pacific Alliance, and ALBA-TCP - are relatively new creations, their development and relationships with each other should continue to be monitored and studied over time. COVID-19 provides a quantifiable stress test by which to evaluate regional organizations around the globe and should be analyzed to gauge their staying power over the coming years.

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A Look at How Family Communications Influences Human-Dog Communications

Pet dogs are an integral part of many American families. With the onset of the SARS-CoV-2, a rise in pet ownership occurred. Because pet dogs are increasingly being added to American families, the purpose of this study was to investigate how we learn to communicate with pet dogs.

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Abstract

Throughout the entire world, one nonhuman animal has been owned more than any other animal. 33% of the world's population owns a pet dog. Nearly 70% the United States consumers own a pet, with the pet dog making up 50% of that number (Petfood Industry, 2016). The number of dog-owners is only increasing; therefore, it is imperative that we continue to investigate the human-dog relationship, which is known as interspecies communication. The present study used a survey to investigate how the parent-child relationship influences the human-dog relationship with a keen focus on communication. Participants were selected through a convenience sample at a public university in the Southeast United States and social media. The participants took a survey to assess their perceptions on their individual perception of their parent-child relationship and their human-dog relationship.

The findings found that a correlation did not exist between parent-child and human-dog communications. One can infer that social learning and family communication pattern theory did not influence the way an individual learns to communicate with their pet dog. Furthermore, it should be noted that the study was limited by the sample size, sampling method, types of dogs, age of children, and number of pets in households. Future studies by other researchers will help further our collective understanding of human-dog communications.

Keywords: parent-child relationships, human-dog relationships, communications

1. Introduction

The goal of the research is to understand how a parent-child communication influences human-dog communication. Researchers have investigated how the parent-child relationship influences a child's future communications while other research have investigated the human-dog relationship with a focus on attraction, attachment, and personality factors. However, the literature is lacking in truly examining why we speak to our dogs in the ways in which we do. For example, some owners use harsh vocalics, like yelling, and some dog-owners communicate in a similar fashion to

parent-infant communication with all manners of communications in between. The current study sets out to survey college students that own their own pets to assess their parent-child relationship, and their relationship with their dog to see if a link can be discovered between the two variables. I predict that the parent-child relationship will correlate with the human-dog relationship.

Talking with Dogs: A Look at How Family Communications Influences Human-Dog Communications

Dogs have uniquely evolved

alongside humans for approximately 11,000 years (Rincon, 2020). At first, dogs would scavenge scraps for human settles before helping humans with different task, for example, hunting, protection, and emotional needs. Now, dogs are considered a part of the family in the Western world. Dogs evolved to interpret human communication with a curious accuracy (Bray, Gnanadesika, Horschler, Kennedy, Famula, & MacLean, 2021).

We have developed an unique interspecific bond with canines unparalleled by any other nonhuman animal. The ownership of dogs is increasing in the United States (Phillips-Donaldson, 2021). Therefore, by better understanding our interactions with pet-dogs, we can facilitate stronger bonds and better interactions. The following review of literature will explore how the: family unit, the dog, and the dog-human relationship all interconnects under the scopes of the Social Learning Theory and Family Communication Pattern Theory.

2. Literature Review

Definitions

Firstly, the Social Learning Theory is defined as the observing, modeling, and imitating of behaviors, attitudes, and emotional reactions of others (McLeod, 2016). Secondly, the Family Communication Pattern Theory (FCPT) is defined as general theory of family communication that focuses on parent-child communication concerned with establishing a shared social reality (Koerner, Schrod, & Fitzpatrick, 2017). Thirdly, social understanding will be defined

as the ability understand other's need and one's own needs (Nichols, Svetlova, & Brownell, 2009). Lastly, referential communication will be defined as the ability to provide and understand specific information (Bunce, 2018).

Theoretical Framework

Firstly, the Social Learning Theory allows one to understand how people come to learn to behave, react, and think. At the heart of the theory, one can understand that human behavior is not only innate but learned from one's environment. This is important because this study is investigating how one's communication environment influences their communication with their pets. Next, the FCPT will help to understand how families communicate together and individually. At the heart of FCPT, one can come to understand that the parent-child relationship is the foundation from which the child learns and views the world. Both theories will help to understand the differing ways we communicate and interact with pet dogs.

Family Unit

To begin to understand how we communicate with our dogs, we must start at the family level of examination. Researchers Portner and Riggs (2016) examined the Compensatory and Congruence theories' effects on parent-child relationships on sibling relationship quality in emerging adulthood. Their findings supported the Congruence Theory that control, and care are important variables in understanding sibling relationships. While Portner and

Riggs examined the parent-child relationships, researchers Paul and Serpell (1996) examined how adding a dog to a family influences the way a family and its members go forward with having a dog. They found that dog-owning children were visited by friends more, dog-owning families engaged in more leisure activities together, and dog-owning children saw an increase in illnesses.

After examining the family at large, we need to look at how children interact and communicate with a pet dog. Researchers Filiatre, Millot, Montagner, and Eckerlin (1988) implemented research from two fields: spontaneous child-dog communications within the home and immediate surroundings, and an experimental analysis of sensory characteristics between child-dog interactions. The report found that the age of the child was the most discernible variable regulating behaviors in child-dog interactions. By continuing to examine the dog-child relationship, researchers Filiatre, Millot, and Montagner (2002) looked at the communication between children and their pets. Researchers found that the children would often initiate communication with their dogs, also the children seek more physical contact with the dog(s).

Dogs

The next factor in understanding the human-dog relationship is to look at the literature regarding dogs specifically. Researchers Topál, Miklósi, and Csányi (1997) investigated a dog's ability to problem solve, which they believed to be tied to the dog's relationship with its owner.

The authors found that a dog's ability to problem solve was influenced by their owner. After discovering that a dog's attachments can influence its cognitive abilities, researchers Kis, Topál, Gácsi, Range, Huber, Miklósi, and Virányi (2012) noted that dog-infant comparisons have indicated that both species have the probability of performing preservative errors. The researchers found that adult dogs show a tendency to persevere in a two-way search task. In rounding out the literature, researchers Karl, Boch, Zamansky, Van der Linden, Wagner, Völter, Lamm, Huber (2020) wanted to continue to understand the human-dog relationship. The researchers investigated the relationship between pet dogs and their caregivers, which is akin to human infants and their mothers. The study found dogs that viewed images of caregivers activated regions of the brain associated with attachment.

Dog Owner—Dog

The last level of this literature review will focus on the dog owner-dog relationship and communication. Starting off, researchers began by examining what factors, like gender and personality, facilitate an attraction between humans and dogs. Researchers Wedl, Schöberl, Bauer, Day, Kotrschal (2010) examined how individual and social factors effected the social attraction between dog and their owners. The study found that multiple factors do influence attraction to their owners. After learning that gender does play a role in social attraction, researchers examined how men and women interact with dogs. Researchers Prato-Previde, Fallani, and

Valsecchi (2006) found that women verbally communicate more with their pet dogs more than men. Also, women's utterance was similar infant-directed speech, and there were no gender differences in affiliative and play behaviors nor attachment levels. After examining how gender influences human-dog interactions, researchers examined the role of personality on the human-dog relationship. Researchers Kis, Turcsán, Miklósi, and Gácsi (2012) focused on the relationship between a dog owner's personality, behaviors, and their dog's behavior witnessed in dog-owner interaction and dog-stranger interaction. The study observed that certain dog-owner personality traits do correlate with dog behavior, and the authors concluded that some aspects of a dog-owner's personality did correlate with their dog's attention level.

Moving along, researchers wanted to further understand just how humans and dogs form an attachment. Researchers Siniscalchi, Stipo, Quaranta (2013) conducted a study to understand how attachment bonds influences dogs. The findings were correlational, but the results did establish that a link between owner personality and dog behavior exist. Furthermore, the literature supported the notion that there is a form of social learning occurring between dog owners and dog in both nonverbal and verbal aspects. Researchers Pongráz, Miklósi, and Csányi (2001). The researchers found that the communication between dogs and owners could be described as a type of social understanding. Next, one can see that the nonverbal communication forms of gestures and eye contact promote social learning in

dogs. Researchers Savalli, Resende, and Gaunet (2016) conducted a study to delve into how human nonverbal communication influences the production of communication between human and dogs. They found that dogs relied not exclusively on one visual cue, but dogs relied on several visual clues to communicate effectively. Also, it was noted that eye contact was the strongest visual cue used to communicate effectively. The study suggested that dogs may have improved the referential communication.

In Conclusion

Dogs have been a part of the lives of humans for thousands of years; moreover, dogs have evolved to be attuned to both human verbal and nonverbal communications. Additionally, it is important that we understand the ways we connect and communicate with pet dogs. Through the Social Learning theory, we can see that dogs do learn from us, and we learn from our families. Through the FCPT, we can understand that we first learn to communicate through our family, which we have the potential to carry with us. The following literature review examined the human-dog relationship.

RQ: Does the parent-child communication relationship influence how we interact with pet dogs?

3. Methods

Participants

Study participants included a total of

325 participants. Of the 325 participants, 282 participants were female, 33 participants were male, 8 participants were non-binary, and 2 participants preferred not to say. Furthermore, the age of participants was diverse. Of the 325 participants 28 participants were between the ages of 18-24. 93 participants were between the ages of 25-34. 89 participants were between the ages of 35-44. 59 participants were between the ages of 45-54. Lastly, 56 participants fell into the age group 55+. Participants were obtained through convenience sampling at a public university in the Southeast United States and social media.

Procedures

The research was conducted through a survey. A survey was chosen because it is the easiest method to obtain a large sample size (Jones, Baxter, & Khanduja, 2013), and a survey was chosen because it required no in-person interaction due to SARS-CoV-2 concerns. The survey was distributed by faculty to students, and the study was published on social media. A prelude to the survey was a short script that invited people to participate, gave background information on the study, and contained a hyperlink to the survey through Qualtrics.

The first seven questions pertain to parent-child communication, questions eight through twelve pertain to pet communication, and the last three questions cover demographics. The fifteen questions were closed-ended and rated on a Likert scale. (see Appendix). Once participants followed the link, they would be greeted with an informed consent page, also participants were able to withdraw at any

point without penalty. The participants were also given a resource to consult should the survey cause any psychological discomfort. Once consent was obtained, participants were able to take the brief fifteen question survey.

Data Analysis

The data was analyzed through SPSS 26 to perform a statistical analysis using the spearman correlation test and kruskal-wallis test. Furthermore, the data was cleaned to remove any incomplete responses.

4. Results

Parental Communication

I performed a spearman correlation to see if self-reported parenting styles correlated with other styles. I found a statistically significant, moderate positive between democratic parenting-style and perceived leniency: $r(322) = .351, p < .001$. As people reported that their parents' communication was democratic, people also felt their parents were moderately lenient. I found statistically significant, weak negative correlation between democratic parenting style and perceived parental absentness: $r(323) = -.250 < .001$. As people reported that their parents' communication was democratic, people also perceived that their parents were not absent. I found a statistically significant, negative relationship between democratic parenting and perceived. I found a statistically significant, moderate negative relationship between

democratic parenting and perceived autocratic parenting: $r(323) = -.566, p < .001$.

As participants reported that their parents' communication was democratic, the participants perceived that their parents were not autocratic. I found a statistically significant, strong negative relationship between democratic parenting and perceived closed communication climates: $r(323) = -.638, p < .001$. As participants reported that their parents' communication was democratic, the participants perceived that the family communication was not a closed communication environment. I found a statistically significant, strong positive relationship between democratic parenting and perceived parent-child open communication climates: $r(323) = .734, p < .001$. As participants reported that their parents' communication was democratic, they strongly perceived that their family had an open communication environment. I found a statistically significant, weak positive relationship between democratic parenting and perceived parental influence on their child's communication: $r(323) = .198, p < .001$.

As participants reported that their parents' communication was democratic, the participants perceived that their parents influenced the way in which the participants communicate now. I found a statistically significant, weak positive relationship between parental leniency and perceived parental absentness: $r(322) = .156, p = .005$. As participants reported that their parents were lenient, the participants also perceived that their parents were absent. I found a statistically significant, moderate negative

relationship between parental leniency and perceived autocracy: $r(322) = -.540, p < .001$. As participants reported that their parents were lenient, the participants perceived that their parents were not autocratic. I found a statistically significant, weak negative relationship between parental leniency and perceived closed communication climates: $r(322) = -.266, p < .001$.

As participants reported that their parents were lenient, participants perceived that their communication was more open than closed with their parents. I found a statistically significant, moderate positive relationship between parental leniency and perceived open communication climates: $r(322) = .331, p < .001$. As participants reported that their parents were lenient, participants perceived that they had an open communication climate with their parents. I found a statistically significant, moderate positive relationship between parental absentness and perceived closed communication climates: $r(323) = .349, p < .001$.

As participants reported that their parents were absent, the participants also perceived that they had a closed communication climate with their parents. I found a statistically significant, moderate negative relationship between parental absentness and perceived open communication climates: $r(323) = -.328, p < .001$. As participants reported that their parents were absent, the participants also perceived that they did not have an open communication climate with their parents. I found a statistically significant, moderate positive relationship between parental autocracy and perceived closed

communication climates: $r(323) = .539, p < .001$. As participants reported that their parents were autocratic, the participants also felt that they had closed communication climate with their parents. I found a statistically significant, moderate negative relationship between parental autocracy and perceived open communication climates: $r(323) = -.538, p < .001$.

As participants reported that their parents were autocratic, the participants perceived that they did not have an open communication climate with their parents. I found a statistically, weak negative relationship between parental autocracy and perceived parental influence on communications: $r(323) = -.174, p < .001$. As participants reported that their parents were autocratic, the participants perceived that their parents did not influence how the participants communicate now. I found a statistically significant, strong negative relationship between closed communication climates and open communication climates: $r(323) = -.870, p < .001$. As participants reported that their parents created a closed communication climate, the participants did not perceive that an open communication climate existed. I found a statistically significant, weak negative relationship between closed communication climates and perceived parental influence on communications: $r(323) = -.208, p < .001$.

As participants reported that their parent created a closed communication climate, the participants did not perceive that their parents influenced how they communicate now. I found a statistically significant, weak positive relationship between open communication climates and

perceived parental influence: $r(323) = .261, p < .001$. As participants reported that their parents created an open communication climate, they perceived that their parents influenced them.

Parental to Pet Communication

I performed the spearman correlation test on the pet communication questions, which are questions eleven through fifteen, to see if the pet communication questions had any statistical significance with the parental communication questions, which were questions one through ten. After the test was performed, it appeared that no relationship existed between the parental and pet communications.

Parental to Perceived Pet Communication

I performed a spearman correlation to see if see parental communication correlated with perceived pet communication. I found a statistically significant, moderate positive relationship between democratic parenting style and perceived parental influence on pet communications: $r(323) = .396, p < .001$. As participants reported that their parents were democratic, they perceived that their parents influenced how they communicated with their pet dogs. I found a statistically significant, weak positive relationship between parental leniency and perceived parental influence on pet communications: $r(323) = .211, p < .001$. As participants reported that their parents were lenient, the participants perceived that their parents influenced how they communicate with their dogs. I found a statistically significant, weak negative relationship between autocratic

parenting and perceived parental influence on pet communications: $r(323) = -.286, p < .001$.

As participants reported their parents were autocratic, they did not perceive that their parents influenced how they communicate with their pet dogs. I found a statistically significant, moderate negative relationship between closed communication climates and perceived parental influence on pet communications: $r(323) = -.330, p < .001$. As participants reported that they had a closed communication climate with their parents, they did not perceive that their parents influenced how they communicate with their pet dogs. I found a statistically, moderate positive relationship between open communication climates and perceived parental influence on pet communications: $r(323) = .394, p < .001$. As participants reported they had an open communication climate with their parents, they perceived that their parents did influence how interact with their pet dogs. I found a statistically significant, weak positive relationship between perceived parent influence on their child's communication and perceived parental influence on pet communications: $r(322) = .165, p = .003$. As participants reported they believed that parents influence how they communicate, they perceived that their parents did influence how they interact with their pet dogs.

5. Discussion

The study aimed to gain better understanding of how parent-child communication influences human-dog

communication, which is called interspecies communications. To execute the aim, the primary research question sought to understand if the parent-child communication relationship influences how people interact with their own pet dog(s). The study sought to better understand if an individual will grow up and communicate to their pet dogs in a similar fashion to their parents. For example, if a parent used harsh language when correcting or a pet dog, a parent that talked to their pet dog using speech akin to infant-directed speech, or other forms of paralanguage. By understanding how we learn to communicate with pet dogs, we can better understand ourselves, and we can effectively communicate with our pets better. The findings of this study suggest that there is no correlation between parent communications and parental to pet communications.

The conclusion of the results was surprising because the Social Learning theory theorized that individuals would imitate the reactions, behaviors, and attitudes of others (McLeod, 2016). Furthermore, Researchers Savalli, Resende, and Gaunet (2016) found that human nonverbal communication promotes social learning in dogs. With this theoretical framework and literature in place, I believed that young children would imitate how their parents communicated and interacted with pet dogs; however, the results did not support this theory, nor did the results translate to social learning between humans leads to social learning in dogs. The results found that no correlation existed between parent-child communication and pet communications. The next theoretical

framework of the thesis was the family communication pattern theory (FCPT).

The FCPT held that parental-child communications aimed to create a shared social reality (Koerner, Schrodt, & Fitzpatrick, 2017). FCPT would work in connection with the Social Learning Theory because if one imitates their parents' attitudes, behaviors, and reactions, then the Social Learning Theory would facilitate a shared reality in parental-child communications; however, the results did not support this notion. FCPT did not correlate with the ways in which a child communicates and interacts with their pet dogs. I found the finding surprising because through social learning, we often obtain similar behavior and attitudes to parents. Moreover, I believed that the similar attitudes and behaviors in parent-child communications would lend itself to a shared social reality, which would cause a child to communicate with a pet dog the way their parents communicated with a family pet dog. Additionally, the literature regarding the family unit and a pet dog further led me to that notion that parent-child communications connected with pet communications.

Researchers Paul and Serpell (1996) found that adding a dog to the family increased family engagement and researchers Filiatre, Millot, and Montagner (2002) found that children often initiate communication with pet dogs first. Therefore, I believed that an increase in family engagement would lead to the child learning, through socialization, how to interact with the pet dog, which would have linked parental communications to pet

communications. However, the literature and the survey results were not consistent in this area.

The study did reveal that correlations existed between parenting-styles and other parenting styles. These correlations were self-evident, for example, democratic parenting was positively correlated with open communication styles, and participants believed that their parents influenced how they communicate with other humans. On the other hand, autocratic parenting was correlated with closed communication climates, and participants believed that their parents did not influence how they communicate with other humans now. Democratic parenting leads to more positive feelings toward parents than autocratic parenting. While it was made evident that parenting communications correlated with other parenting communications, findings had no impact on actual pet communications.

However, one significant finding was that people believed that their parents influenced how they communicate with their pets, but the results were not consistent with the findings. The finding was intriguing because the belief of parental influence did not match the answers that people reported. The study did not match my own expectations to my surprise; however, the results were still intriguing. Through socialization, an individual learns how to interact and perceive the world around them. In the case of this study, I theorized that the child would learn, through social learning and family communication pattern theory, how to communicate with their own pets one day. But now it is evident that the way

an individual learns to communicate with their pets can be attributed to factors beyond the parent-child relationship.

Implications

Because the study did not support the research question, one can conclude that parenting communication does not impact pet communications. Therefore, one can conclude that if an individual's parent has a negative communication style, that said individual will not necessarily communicate with their pet dog in such a manner. Conversely, if an individual's parent has a positive communication style, a person will not necessarily communicate with their pet in a positive communication style. An individual's communication style with their pet dog is independent of the parent-child communication relationship. One can conclude that the parental communication style is not the main factor that shapes an individual's communication style with their pet.

Limitations

The present study did have limitations. First, the sample size was small, so future studies will need to be conducted to gain a better insight in human-dog communications. Secondly, the present study had a majority female population, so the male population was not well represented in the study. Because the sample population was captured through convenience sampling, a small, female biased results were obtained. Thirdly, the survey instrument did not have a broad nor diverse set of demographic questions. Lastly, the survey contained a small set of

questions that were not able to capture the complex nature of interspecies communications.

Recommendations

A future study can counter the above-mentioned limitations through obtaining a larger, more diverse population. It is recommended to try a different sampling method instead of convenience sampling. Also, implementing interviews would potentially uncover more nuanced themes and information than a survey can offer. Furthermore, a future study should focus on how an individual learns about pet care and training. For example, did the individual attend any dog training classes whether online or in person, did the individual consult any literature regarding pet dogs, did the individual watch dog training and care videos on the Internet like YouTube, and who did the person look to when they need guidance on communicating and interacting with their pet dog, for example, a popular dog trainer at the time, a friend or relative, or other sources. Other salient questions include what type of dog one has, how many pets are in the household, and age of people interacting. By asking these questions, a future researcher can better understand how we learn to communicate with our pet dogs.

6. Conclusion

The study was designed to investigate the parent-child and human-dog communication relationship. Specifically, the study aimed to see if the parent-child

communication relationship influences how the child communicates with their pet dog. The study was conducted through a survey via Qualtrics using convenience sampling and through social media. The study concluded that no relationship exists between parent-child communications and human-dog communications. The study did find that participants did believe that a relationship did exist; however, the data did

not support the belief nor research question. Moreover, the study illuminated the need for future research to help better understand the unique relationship between humans and pet dogs. Lastly, everyone wants to feel heard and understood, dogs have uniquely evolved to understand human communications, and now it is our turn to understand pet communications better.

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8. Appendix

Script: You are invited to participate in a research study. Please follow the Qualtrics link to participate in the research study.

Survey questions:

1. Would you describe your parents' parenting style as democratic and responsive toward you? For example, "You can always talk to me".
2. Would you describe your parents' parenting style as lenient with few rules? For example, "You are the boss".
3. Would you describe your parents' parenting style as passive and absent? For example, "You can figure it out on your own".
4. Would you describe your parents' parenting style as autocratic? "Do as I say".
5. Growing up, would you describe your family's communication climate as closed? For example, did you feel uncomfortable disclosing information to your parents?
6. Growing up, would you describe your family's communication climate as open? For example, you felt that you could disclose information to your parents easily.
7. Do you feel that your parents' communication style influenced how you communicate with others now?
8. When interacting with your dog, would you describe your leadership as assertive and attentive?

9. When interacting with your dog, would describe your leadership as accepting and indulgent?
10. When interacting with your dog, would describe your leadership as having competing priorities and little time?
11. When interacting with your dog, would you describe your leadership as having clear rules and use of punishments?
12. Do you feel that the way you communicate with your dog is similar to how your parents communicated with you?
13. Do you now, or have you had any companion dogs?
14. Please state your sex.
15. Please indicate your age group.



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