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Section 1. Cultural studies

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NO GAME, NO GAIN: VIDEO GAMES ARE PORTALS TO EXPLORATION, CONNECTION, LEARNING, AND FREEDOM

Abstract. Indeed, gaming addiction is an issue among adults as well as youths that has concerned many. But is gaming entirely deserving of all negative associations and are there no better ways? Chinese authorities should reconsider their new online gaming ban.

Keywords: China, video games, gaming, community, social, platforms, regulation.

You eagerly enter your room, plop down your backpack, and turn on your device. It has been a long day of classes, but right now is the time to take a mental break from the stress of school. Maybe you'll catch a few friends online today, or even make some more? The day's fatigue lifts a little and a spark of excitement flares in your chest as you open your favorite online video game. Undoubtedly, this is how I felt as a gamer and former student in China. However, this positive energy gamers perceive is not shared by some others: to many parents and Chinese authorities, online gaming is detrimental to children's health and academic performance. Suddenly, regulators are limiting playing time for minors to a mere three hours on weekends and holidays, starting in August 2021. Indeed, gaming addiction is an issue among adults as well as youths that has concerned many. But is gaming entirely deserving of all negative associations and are there no better ways? Chinese authorities should reconsider their new online gaming ban.

Some may think of an antisocial introvert when imagining a gamer, but that may not be entirely accurate. Online gaming counters "disrupted social networks" and "long work hours" by "[offering] a so-

cial outlet and an easily accessible hobby" [1]. I am familiar with the competitive environment and demanding course loads of Chinese schools, and quick relaxation and social interaction are, in fact, much needed elements in a student's day. Video games provide substantial online communities of people sharing similar interests, available to anyone with an electronic device. They act as platforms for players to interact and collaborate, connecting people across the world and allowing them to form lasting friendships and bonds that they otherwise never would have made. In this way, games can actually encourage prosocial behavior among youths.

Some parents may also argue that gaming makes children empty-headed and harms their academic capabilities. Despite the common belief that video games are unproductive and pointless, however, research studies have suggested that they help develop children's cognitive abilities and learning. According to Dr. Marc Palaus, Ph.D. who led one such study, games "require mentally holding and manipulating information to get a result" [2]. "Video games are a perfect recipe for strengthening our cognitive skills, almost without our noticing," he says [2]. They improve one's memory as well as

things like mental focus and problem-solving skills. Even action games, which are generally deemed as too aggressive, correlate with heightened visual processing abilities, mental flexibility, and reaction time [3]. Perhaps online games aren't so terrible for minors.

Additionally, families hope a public policy would better enforce children's obedience. One Chinese parent says, "Some teenage kids just won't listen to their parents' discipline, and this policy can control them... it amounts to the state taking care of our kids for us" [4]. However, with so many factors complicating this issue, shouldn't parents want to engage in this issue themselves rather than rely on the government? See this as proof that it may be better for par-

ents to handle it *with* their children. Families should take this as an opportunity to establish more trusting and understanding relationships. Instead of using a more authoritarian style, families could discuss together and reach a consensus on an appropriate balance. Thus, it would be more beneficial for families to address game addiction themselves by tailoring their approach to achieve mutual respect.

Video games are portals to exploration, connection, learning, and freedom. In making policies to address gaming addiction, Chinese authorities should also consider the many benefits of video games as to not so crudely oversimplify the issue and to allow flexibility, or step back and encourage parent participation.

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Section 2. Literature

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DYSTOPIAN DOUBLETHINK, TONES, AND HISTORY IN GEORGE ORWELL'S 1984 AND PHILLIP K. DICK'S UBIK

Introduction

As a well widely celebrated science fiction novel, George Orwell's *Nineteen Eighty-Four* imagines a world of totalitarian reign and the attempts of its citizens to rebel against the authoritative power. *Nineteen Eighty-Four* takes place in a version of London, on a continent referred to as "Oceania," where the main character Winston Smith works for the party of the mysterious "Big Brother" in the Ministry of Truth, which alters the historical records according to the instructions and will of the party's leaders. Winston has long felt oppressed by the party and longed for the freedom of ordinary life and the true past. Sent to the Ministry of Love (ironically the opposite, a place for punishment and reform) by O'Brien, a character who plays an important role in the destruction of Winston's unfaithful thoughts, to be brainwashed, Winston's spirit will eventually get crushed by the inhumane treatment in Room 101 and becomes devoted to Big Brother and the party. Above all, "Doublethink," the ability to believe in the coexistence of reality and deception, and the conscious and unconscious is one of the central themes of the book.

Philip K. Dick's *Ubik*, in comparison, is a rather less known—but equally powerful—novel that appeals to the ambivalence of life and death. Published in 1969 it is set against a backdrop of a futuristic version of the year 1992 when technologies have allowed the deceased to remain mentally alive in the real world for a limited period of time, known as the "half-life." In this world, many moratoriums serve as an in-

termediate place for the half-lives to communicate with their loved ones, including one run by Herbert Schoenheit von Vogelsang. One of the protagonists, Joe Chip, belongs to a group of 11 anti-telepaths (called "inertial") at Runciter Industries. They become entangled in the world between life and death after experiencing a conspiratorial explosion on Luna, an outer space project suspected of possible telepath intrusion in their confidential system. As the plot unravels, Joe discovers that the world is rapidly shifting backward in time, as many objects are deteriorating, and the "inertial" population are wrinkling and dying. Nearly drained of life, Joe is temporarily rescued by Runciter himself, who sprays a can of the eponymous "Ubik" on Joe's body. Now searching for more Ubik to prolong his remaining life, Joe meets Ella, Runciter's half-life wife, who explains that it was Jory Miller, a young and powerful half-life, who has been using up and killing the "inertial" around him to supplant his own life. Toward the end of the story, as Ella's remaining half-life dies away, she convinces Joe to succeed after her to help Runciter defend against Jory's intrusion in the future.

Nineteen Eighty-Four and *Ubik* both grapple thematically with the coexistence of opposing ideas or realms and share a pessimistic and sarcastic tone that invites analysis of how each writer's background informs their own novel's worldview. For Orwell, it was the Second World War that influenced his democratic socialist perspective, while for Dick it was his personal addiction to amphetamines.

Though the physical qualities of *Ubik* remain ambiguous throughout the novel, Dick gives clues as to its significance. Ultimately it is identified by Francesca Spanish, who dreamed that “a great hand came down from the sky, like the arm and hand of God... And I saw what it contained” [2, 162]. Clearly, then it is a vital substance, as “the lives of everyone else on Earth depended on it.” While *Ubik* lifts characters from the pain of their regression in time, it also acts like a drug to which people will gradually develop an addiction. *Ubik*’s properties as a mind-altering drug also correspond with the overall hallucinogenic setting of the book, a key feature that helps the reader distinguish between reality and the half-life. To a great extent, the concept of *Ubik* fits well into the themes of economic development and commercialization which recur throughout the book.

The research begins by focusing on Doublethink’s application to both books. Orwell defines Doublethink as “the power of holding two contradictory beliefs in one’s mind simultaneously and accepting both of them” [7, 214] in the book called the *Theory and Practice of Oligarchical Collectivism* “written” by Emmanuel Goldstein, the revolutionary character who rebelled against the Big Brother’s party in *Nineteen Eighty-Four*. While it is very likely that Goldstein was a fictional person made up by the party to control the mindset of the citizens in Oceania, this chapter of his book discusses the idea *Ignorance is Strength* and analyzes the party’s essential beliefs.

It is a testament to Orwell’s genius that Doublethink can be applied to so many issues, such as economic inequality, political systems, and racial injustice, in contemporary society. It can be used as a strategy to win people’s trust and manipulate their minds. For instance, former United States President Donald Trump spreads white supremacist opinions against racial and ethnic minorities in his political campaigns and speeches. Bernie Sanders and Elizabeth Warren, the Senators of Vermont and Massachusetts, have openly denounced Trump’s racist and manipulative words—accusing, for instance, Mexican

Americans of being “rapists and criminals” and attacking immigrants with calls for them to “go back to the country they came from” [5]. Similarly, he defended the white supremacists who stormed Charlottesville, VA in August 2017 and refused to condemn racists in his 2020 Presidential Election (The New York Times “Trump Refuses to Condemn”) [9]. Trump’s tactics demonstrated Doublethink by placing unfounded guilt on people who belong to a different nationality and race than himself while subtly allowing racists to obstruct civil equality in America (Di Maggio “Orwell’s Doublethink”) [3]. He was able to manipulate the thoughts of some Americans by infusing false moral standards into their minds while encouraging impediments to justice. This coexistence of two contradictory beliefs during Trump’s administration exemplified Doublethink in modern politics.

Doublethink can also be found throughout *Ubik*. Joe Chip and the other characters are unknowingly immersed in a half-life world until they realize the confusion between reality and illusion. They were mentally active and considered to exist in the “real world,” even as their dying torsos lay in the world regressing back in time. The coexistence of “life” and “death” in the *Ubik* characters exhibits Orwell’s Doublethink. Furthermore, in his introduction to *Ubik*, Joe Chip discovers the two contradictory messages from Runciter, one stating that he is alive, and they are dead, and another says that he recorded while still alive—insinuating that he is now dead. The difference lies within *Ubik*’s conclusion, where Joe Chip chooses to remain in the “half-life” world that is regressing and holds on to the coexistence of reality and deception using the intermediary of *Ubik*. Philip K. Dick intended that the Doublethink between “life” and “death” would eventually meltdown, rather than become a firm, well-defined border. *Ubik*, therefore, is used as a remedy to cover up the convergence of the two opposing worlds.

In Orwell we see Doublethink illustrated in the paradoxical naming of the party’s departments: “The

Ministry of Peace concerns itself with war, the Ministry of Truth with lies, the Ministry of Love with torture, and the ministry of plenty with starvation" [8, 216]. It is a fundamental measure used by the "High" class of the society to control the minds of the commoners through the confusion and to retain the principle of contradiction between the ministry's name and the affairs it supervises. The mission of the Ministry of Peace relies on the party slogan *War is Peace*, for instance. The Ministry of Truth, where Winston works, alters history and eradicates unfavorable contents for the party, which is highly ironic to the stated purpose of Oceania, in which each of the terms granted to the ministries are deprived of the public. Then there is the Ministry of Love, which is the place where Winston is tortured and brainwashed after his conspiracy against the party is exposed. With all these juxtapositions of opposing rights of the people, Orwell establishes the underpinnings of Doublethink in *Nineteen Eighty-Four*. As the basic structure of the party government is established based on this confusion of principles, greater factors such as managing the population become easier.

Probably the most famous quote from 1984 is the party slogan: "War is Peace, Freedom is Slavery, Ignorance is Strength" [8, 4; 16; 26; 104]. Appearing multiple times in the novel, the essential ideas from these three slogans can be found in both books, and I will explain how social factors at the point of publication influenced the use of doublethink in each. The name of the protagonist Winston Smith can be linked to two allusions. First, to the famous British Prime Minister Winston Churchill during WWII, who led the Allied powers and Britain to fight against the Nazis. Orwell makes this allusion to Churchill to praise him as a successful leader because he was a figure who stood up to resist the oppressive regime of Germany and promote peace and social justice, which is mirrored in Winston Smith's self-determination to liberate himself from the bond of the Big Brother's government. Secondly, the name Smith is an extremely common name that is synonymous

with the "everyman" in English culture. Winston Smith is, therefore, a contradiction in terms: an ordinary man of his time who has the potential for greatness within him. *War is Peace* ensures that having a common enemy will unite the people and prevent internal conflicts in the nation. In a letter he wrote to Noel Willmet about his conception of the book, Orwell talked about the fact that most movements seeking to reform or conquer take the non-democratic measure; they are often divided into different castes and led by an autocratic leader. Admittedly, he points out, "Hitler can say that the Jews started the war," and obviously exercised the essentials of doublethink by blaming the actual victims, the Jews, for World War II (Orwell "Letter to Noel Willmet") [8]. Hence, "*War is Peace*" in that targeting an outside enemy maintains internal peace, or nationalism, as in the case of World War II. In reverse, going into war can sometimes restore peace at home. For instance, Adolf Hitler believed in the idea of remilitarization of Germany and spreading the glory and power of the nation. When Germany invaded Poland in 1939, Britain and France declared war on the peace-breaker (Taylor "World War II") [10]. By joining the war, Britain and France would be able to unite the people against the common enemy, Germany, and prevent tyrannical ideals from spreading into other European nations. Similarly, the containment policy laid out by George F. Kennan in 1947 to combat the Communist spread also exhibits *War is Peace*. The Truman Doctrine impacted the United States' intervention in the Korean and Vietnam wars; only by controlling the spread of communism would the United States be able to keep itself from foreign entanglement and the degradation of American culture.

The next mandate, *Ignorance is Strength*, explicates the idea that the ability to access knowledge and possess independence enables people to realize the conspiracy of the party's brainwashing strategy. "In the long run, a hierarchical society was only possible on a basis of poverty and ignorance." because when Ignorance occurs, "leisure and security were enjoyed by

all alike" [8, 190]. On the contrary, when "the great mass of human beings who are normally stupefied by poverty would become literate and would learn to think for themselves," "they would sooner or later realize that the privileged minority had no function, and they would sweep it away" [8, 190]. This quote helps to understand Orwell's meaning in *Ignorance is Strength* because only by maintaining the citizens in a state in which they cannot "think" about the dominance of the social elites, can a society be maintained peacefully with the strengths given to those in power. In fact, many states have suspected belligerent countries during the Second World War and Cold War of using brainwashing tools to manipulate the minds of their people. The Nazi's Dachau concentration camp, for example, subjected "political prisoners," including Gypsies, Jews, homosexuals, and socialists, to forced labor and medical experiments. Hundreds of Dachau prisoners were injured and died from the disease-resistant testing apparatuses and human hypothermia experiment, which examined victims' body temperature recovery after being placed in ice-water baths and moved to warm baths [12, 1436]. Thus, the administrators, whether they are the Nazis or the American government, were inversely empowered by limiting the freedom of speech and ability of testing subjects.

Similarly, the idea of "Illusion is reality" from *Ubik* is closely connected to *Ignorance is Strength*. When the civilians are "stupefied" and kept in a state of poverty, the government successfully oppresses the people's minds in ignorance and thus gains power from it. Being "stupefied" can also mean allowing the overarching power to illude the people from reality. In *Ubik*, the anti-telepaths are put into a state of half-life after the explosion on Luna, although they were totally unaware of it at first. Being deluded from reality, the characters were ignorant about the existence of the truth, the survival of Mr. Runciter, and Jory Miller's conspiracy to exhaust their remaining lives. Likewise, in the United States, the CIA's MKUltra project was introduced during the Cold War to psychologically torture individuals using LSD and other

psychoactive drugs to investigate "whether and how it was possible to modify behavior by covert means" [11, 4]. By being subjugated under official institutions, these victims became either physically or mentally disabled and paralyzed by their own thoughts.

Not only does *Ignorance is Strength* applies to civil life, but also economics when evaluating customer demands. Mindless consumerism enables businesses to extract profits by enticing consumers to buy things less essential to their daily lives. It is a two-fold process, in which one side gets strengthened by profiting from the common customers of the industry. *Ignorance is strength*: Ignorance comes from the fact that consumerism also encourages the idea of individualism rather than the wealth of the nation or society as a whole. Economically incentivized people compete with each other based on social or economic status and the ability to conform to materialism. As a result, people ignore some of the larger societal needs or disruptions, such as environmental pollution, natural resource depletion, and climate change.

Freedom is Slavery indicates the importance of the collective commons because having individual independence as an individual can inhibit one to succeed. Only being subjected to community control will protect individuals from danger. For instance, to chase individual goals, some people would end up evading broader freedoms in order to continue pursuing their dreams. On the contrary, the reverse, *Slavery is Freedom*, is evidenced in the American antebellum debates over the slavery practice. In southern plantations, landlords believed that the enslaved people "are the happiest, and, in some sense, the freest people in the world" because "the children and the aged and infirm work not at all, and yet have all the comforts and necessities of life provided for them", as George Fitzhugh argued in his pro-slavery argument *Cannibals All! Or, Slaves Without Masters* from 1857. "The free laborer", on the other hand, "must work or starve. He is more of a slave than the Negro because he works longer and harder for less allowance than the slave and has no holiday because

the cares of life with him begin when his labors end. He has no liberty and not a single right.”

Freedom is Slavery is also seen in the prevailing psychoactive drugs in the plot of *Ubik*. As aforementioned, PKD was an amphetamine addict who “popped as many as 1,000 amphetamine pills a week, [so] was also more than a little paranoid” (Mcgrath “A Prince of Pulp”) [6]. Thus, the use of *Ubik* as a life-supplanting medicine exemplified an addictive reliance on drugs to survive mentally and physically. His addiction to drugs like amphetamines can be clearly identified as the characters are able to access amphetamine dispenser machines anywhere in that imaginary universe. Amphetamines started to appear in the 1920s and gained much more public attention and consumption in the following 20 years. During the Second World War, soldiers received amphetamine prescriptions to bolster morale and the will to fight, and specific types like Benzedrine pills were advertised as a cure to “tiredness” in American media (Hicks “Fast Times: The Life, Death, and Rebirth of Amphetamine”). People did not realize the negative health effects of amphetamines until the mid-1960s when the FDA started to impose restrictions on their sale and consumption. Therefore, when Philip K. Dick wrote the novel in 1969, he had already been immersed in the amphetamine culture as a Silent Gen. In *Ubik*, the life-saving drug indicates an identical dependence on medical drugs since Joe Chip and Ella need constant sprays of *Ubik* to stay tangible at the half-life stage. This idea connects to “Freedom is Slavery,” as, towards the end of the book, Joe Chip acquires a life-long supply of *Ubik* to sustain his life span during half-life. By gaining the freedom to access *Ubik*, Joe not only secures an endless supply of the drug—every addict’s dream—but also becomes inevitably dependent on it to survive. The latter, thus, locks Joe Chip in “slavery”: the half-life.

Another similarity between *Nineteen Eighty-Four* and *Ubik* lies in their use of tone. The overall tone of *Nineteen Eighty-Four* is rather unadorned and heavy as Orwell establishes the pessimistic and oppressed

attitude of Winston Smith throughout the novel. In Part I, Winston is rigid, alert, and cynical about his colleagues and workplace. Winston describes his co-workers at lunch with an indifferent and disgusted attitude: “on his (Winston’s) left the man with the strident voice was still talking remorselessly away. A young woman... seemed to be eagerly agreeing with everything that he (the man on Winston’s left) said” [7, 53]. Another day, he thought that “nearly everyone was ugly, and would still have been ugly even if dressed otherwise than in the uniform blue overalls” [7, 60]. He goes on to describe a “beetle-like” man who looks “suspicious.” Later, when Winston and Julia are caught in the bedroom above the shop, the language is also hopeless and plain: “Something crashed onto the bed... a ladder had been thrust through... burst in the frame... Someone was climbing... a stampede of boots... the room was full of solid men in black uniforms, with iron-shod boots on their feet and truncheons in their hands” [7, 222]. Verbs like *crash*, *thrust*, and *burst* establish the fast-paced situation of their capture. *Solid*, *black*, *iron-shod*, and *truncheon* paint the image of crude, rough, and violent atmosphere. When composed together, the words give a heavy, forceful, and apathetic tone to the narrative. In the end, Orwell continues using rudimentary language to set up his depressed and failing Winston. “Two gin-scented tears trickled down the sides of his nose. But it was all right, everything was all right, the struggle was finished. He had won the victory over himself. He loved Big Brother” [7, 298]. The first sentence indicates that Winston feels resigned, yet in the following short sentences, he tries to talk himself into believing in the party and disobeying his rationality. The straightforward irony and paradoxical thought here contribute to the overall tone of hopelessness and dejection.

Comparably, *Ubik* has a sarcastic, humorous, and pessimistic tone. On top of that, the surreal content highlights the sarcastic tone of the book. The eleven anti-telepaths have peculiar and hysterical personalities, such as Francesca Spanish, the “luminous, gypsy-like dark woman, radiating a

peculiar, jangled tautness” and strongly revered for her dreams and visions [2, 60]. These qualities of Francesca seemed out-of-ordinary, yet the sarcastic part was that it was her dream about Ubik spray cans that pushes the remaining characters to realize their half-living situation and presses the need to prevent isolated individuals from dying from the time regression.

Interestingly, PKD also employs a comical style throughout. For instance, when Joe Chip tries to open his apartment door for G. G. Ashwood and Pat, the door refuses to open because at that time everything needs to be paid for in order to function. Then, the following slapstick occurs: “ ‘I’ll sue you,’ the door said as the first screw fell out. Joe Chip said, ‘I’ve never been sued by a door. But I guess I can live through it’ [2, 24–25]. The counterintuitive scene, almost impossible in the present, of a door dispute with the main character, gives us glimpses into PKD’s humor and worldview. Pessimism can be seen in the ending, in which Runciter in the real world found paper money printed with Joe Chip’s profile, but we get the feeling that PKD doesn’t take any of it too terribly seriously. In the end, he leaves the resolution open to the reader: “This was just the beginning,” we are told [2, 227]. From the evidence presented throughout the novel, the reader can reasonably infer that the regression of time might have possibly occurred as well in the

real world and mixed up with the half-life world. Therefore, the reader ends the book expecting and imagining that the chaos is just beginning.

Conclusion

Doublethink and its underpinnings are a powerful device used to elaborate on the fundamentals of the plot and beliefs in *Nineteen Eighty-Four* and *Ubik* as well as current political events. No matter if it is *War is Peace, Ignorance is Strength*, or *Freedom is Slavery*, it helps characterize the duality of perspectives in Orwell and Dick’s literature. The prevalence of narcotics and illusionary effects from *Ubik* applies to how a doublethinking world would dispose of the handicapped and keep them in the dark. While the tone often varies between the two books, especially in how they utilize monotone and humor, they are similar in the mocking depiction of tragedy and cruel reality.

This comparative literature analysis establishes one way to interpret Orwell’s language in reference to the historical background of World War II while reading Phillip K Dick’s ‘ *Ubik* through the lens of Orwell’s Doublethink. Learning to understand the often-misconstrued duality of two contradicting ideas allows people to view contemporary political, economic, and social issues with greater ease. Ultimately, Doublethink is nothing less than a key to unlocking disguises, propaganda, or persuasion that draws minds to confusion.

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Section 3. Medical science

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DEVELOPMENT OF A CLASSIFICATION MODEL FOR MENTAL HEALTH

Abstract. Mental health includes our emotional, psychological, and social well-being. It affects how we think, feel, and act. This paper will use the logistic regression to classify whether the person sought to have some mental health treatment. The final model results show that our model has achieved an AUC value of over 0.86, indicating a powerful strength to predict the mental health reorganization of individuals. Also, the report presented that the top factors that influence the mental health condition are age, gender and family history.

Keywords: mental health, AUC, logistic regression, correlation analysis.

Introduction

Research Background

Mental disorders are among the most common causes of disability. The resulting disease burden of mental illness is among the highest of all diseases. In any given year, an estimated 18.1% (43.6 million) of U.S. adults ages 18 years or older suffered from any mental illness and 4.2% (9.8 million) suffered from a seriously debilitating mental illness. Neuropsychiatric disorders are the leading cause of disability in the United States, accounting for 18.7% of all years of life lost to disability and premature mortality [2]. Moreover, suicide is the 10th leading cause of death in the United States, accounting for the deaths of approximately 43,000 Americans in 2014.

Mental health and physical health are closely connected. Mental health plays a major role in people's ability to maintain good physical health. Mental illnesses, such as depression and anxiety, affect people's ability to participate in health-promoting behaviors. In turn, problems with physical health,

such as chronic diseases, can have a serious impact on mental health and decrease a person's ability to participate in treatment and recovery.

Therefore, it is meaningful for people to judge whether one needs or recognize the mental health condition of himself or herself. Now the machine learning techniques can help.

Research Objectives

In this paper, we have several research objectives:

- Clean the data set and deal with the category variables;
- Construct the logistic regression model;
- Use the model to predict the testing set data;
- Evaluate the performance of the model.

Methodology

Data Set Overview

This dataset contains the following data features:

Timestamp;
Age;
Gender;
Country.

state: If you live in the United States, which state or territory do you live in?

self_employed: Are you self-employed?

family_history: Do you have a family history of mental illness?

treatment: Have you sought treatment for a mental health condition?

work_interfere: If you have a mental health condition, do you feel that it interferes with your work?

no_employees: How many employees does your company or organization have?

remote_work: Do you work remotely (outside of an office) at least 50% of the time?

tech_company: Is your employer primarily a tech company/organization?

benefits: Does your employer provide mental health benefits?

care_options: Do you know the options for mental health care your employer provides?

wellness_program: Has your employer ever discussed mental health as part of an employee wellness program?

seek_help: Does your employer provide resources to learn more about mental health issues and how to seek help?

anonymity: Is your anonymity protected if you choose to take advantage of mental health or substance abuse treatment resources?

leave: How easy is it for you to take medical leave for a mental health condition?

mentalhealthconsequence: Do you think that discussing a mental health issue with your employer would have negative consequences?

physhealthconsequence: Do you think that discussing a physical health issue with your employer would have negative consequences?

coworkers: Would you be willing to discuss a mental health issue with your coworkers?

supervisor: Would you be willing to discuss a mental health issue with your direct supervisor(s)?

mentalhealthinterview: Would you bring up a mental health issue with a potential employer in an interview?

physhealthinterview: Would you bring up a physical health issue with a potential employer in an interview?

mentalvsphysical: Do you feel that your employer takes mental health as seriously as physical health?

obs_consequence: Have you heard of or observed negative consequences for coworkers with mental health conditions in your workplace?

comments: Any additional notes or comments

Data Cleaning

First we deal with the missing data. We find that only four columns have missing data: comments, state, work_inference and self_employed. Here we tried to get rid of the variables of “comments”, “state” just to make our lives easier because those two columns contain missing variable over 40%, meaning the features are not informational. Later on, we will drop the observations which contain the missing values or fill in the missing value with mean values.

For the variable gender, which is a category variable, we categorized them into three types: male, female and trans. Later on we encode those three types by dummy variables and did similar encoding method to the other category variables.

Logistic Regression

Methodology Details

Logistic regression – also called binary logistic regression – is commonly utilized in many fields, such as the health sciences.

The “logit” model solves these problems:

$$\text{Ln} \left[\frac{p}{(1-p)} \right] = \alpha + \beta X + e$$

p – is the probability that the event Y occurs, $p(Y = 1)$

$\left[\frac{p}{(1-p)} \right]$ – is the “odds ratio”

$\text{Ln} \left[\frac{p}{(1-p)} \right]$ – is the log odds ratio, or “logit”

The logistic distribution constrains the estimated probabilities to lie between 0 and 1.

The estimated probability is:

$$p = \frac{1}{1 + \exp(-\alpha - \beta X)}$$

if you let $\alpha + \beta X = 0$, then $p = .50$

as $\alpha + \beta X$ gets really big, p approaches 1

as $\alpha + \beta X$ gets really small, p approaches 0

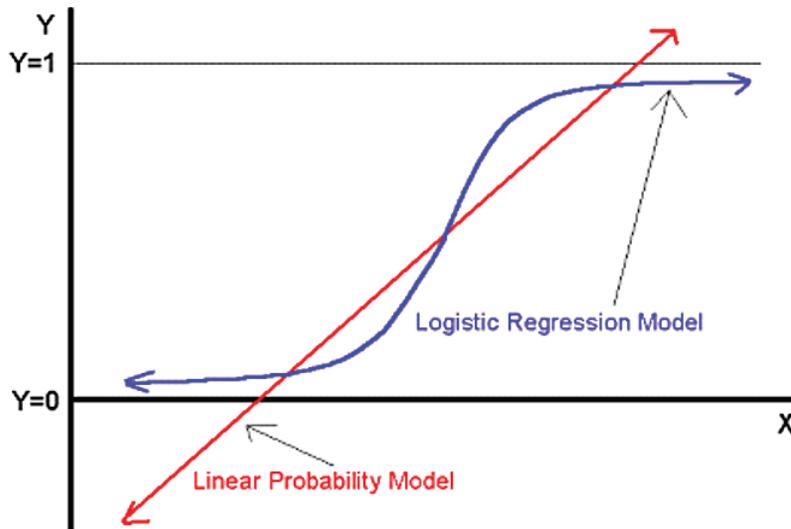


Figure 1. Comparing the LP and Logit Models

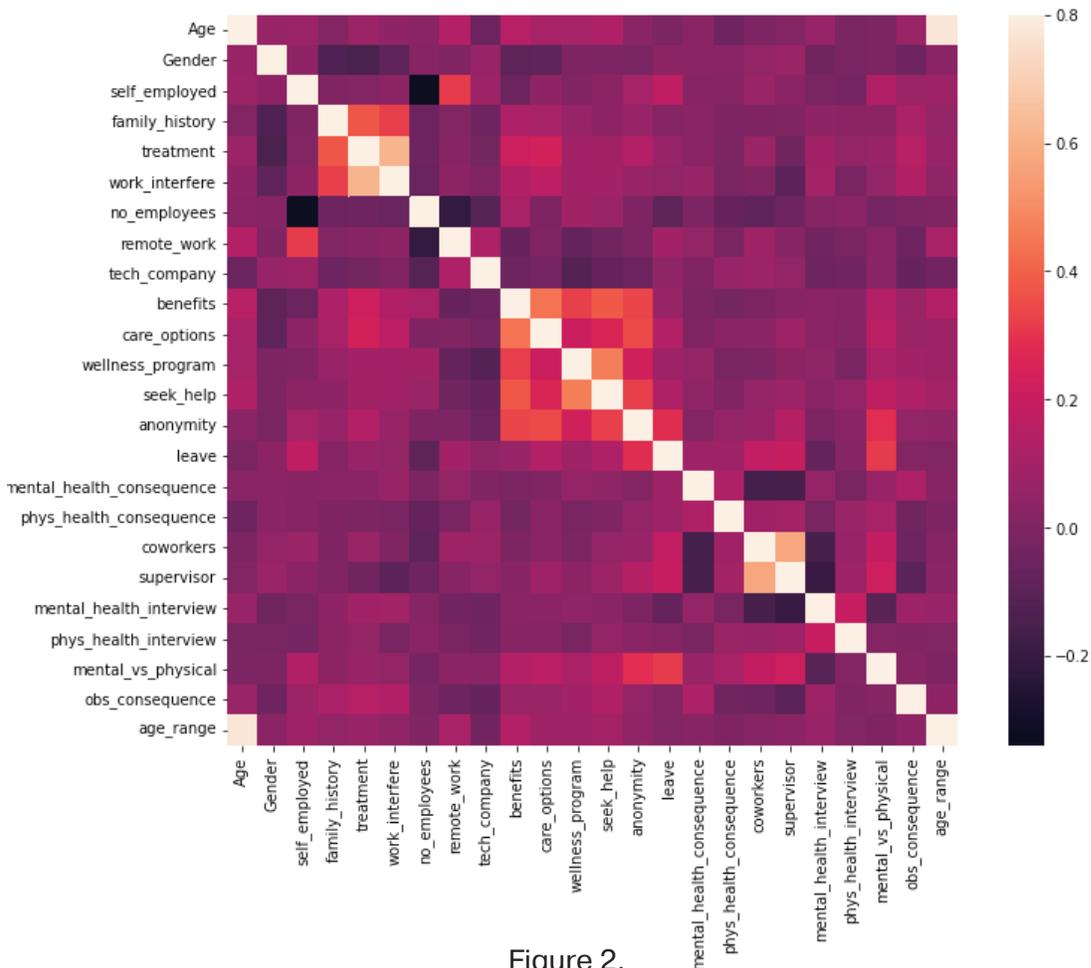


Figure 2.

Model Limitations

Other techniques, such as MANOVA and discriminant function analyses, can also be used to compare groups on multiple variables. Nevertheless, whenever you want to compare only two groups – such as people who completed their thesis on time and people who did not complete their thesis on time – logistic regression is preferable. In particular:

- logistic regression is preferable when the sample size is reasonably large, such as more than 100 individuals or units;
- the main reason is that, whenever the sample size is sufficiently large, the underlying assumptions of logistic regression will be fulfilled;

Implementation Results

Data Visualization

- Correlation Plot.

From the correlation plot we see that “supervisor” and “coworker” are two highly correlated variables but the correlation will not exceed 0.8. Other variables are having relatively low correlation meaning that they are describing the different aspects thus they can all be put into the regression model.

- Age and Gender Details

The above plots show the distribution of the age and the gender information grouped by the age. The population age is focused during 15–25 for both treatments. However, we find that the male has the lowest probability of having a mental health problem among all three genders.

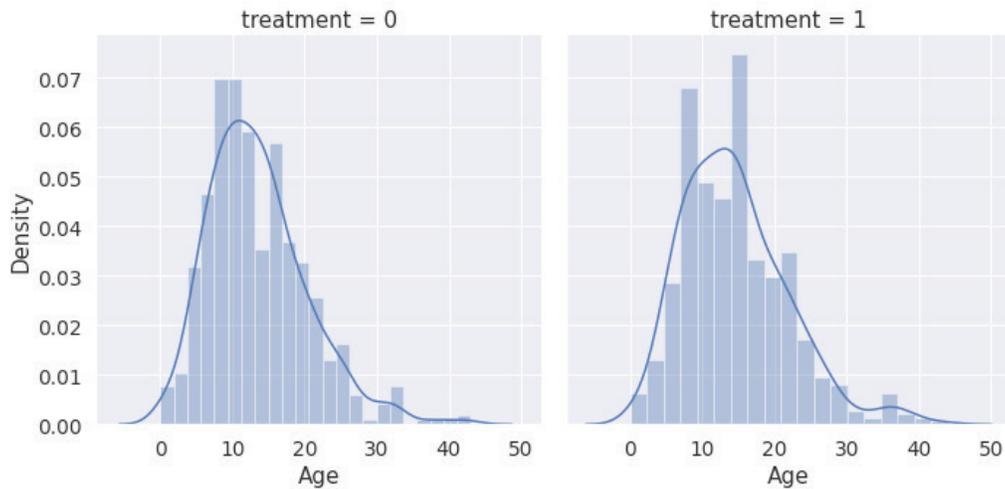


Figure 3.

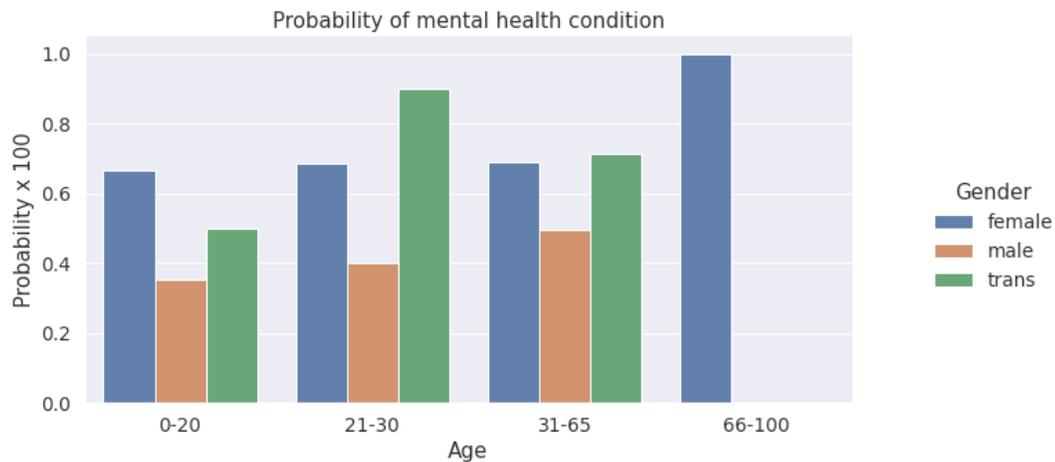


Figure 4.

Feature Importance

In order to find out which features are more important in deciding the mental health condition.

The plot shows that the top three most influential factors in mental health condition is the age, gender and family history. According to the plot showing in section above, we can see that the female have high-

er probability to have mental issue. Meanwhile, the age density plots show that there exists clear trend of age for each gender that different age interval has different change of mental health condition. Also, the feature importance also suggests that the family history is another important factor that can influence people's mental health condition.

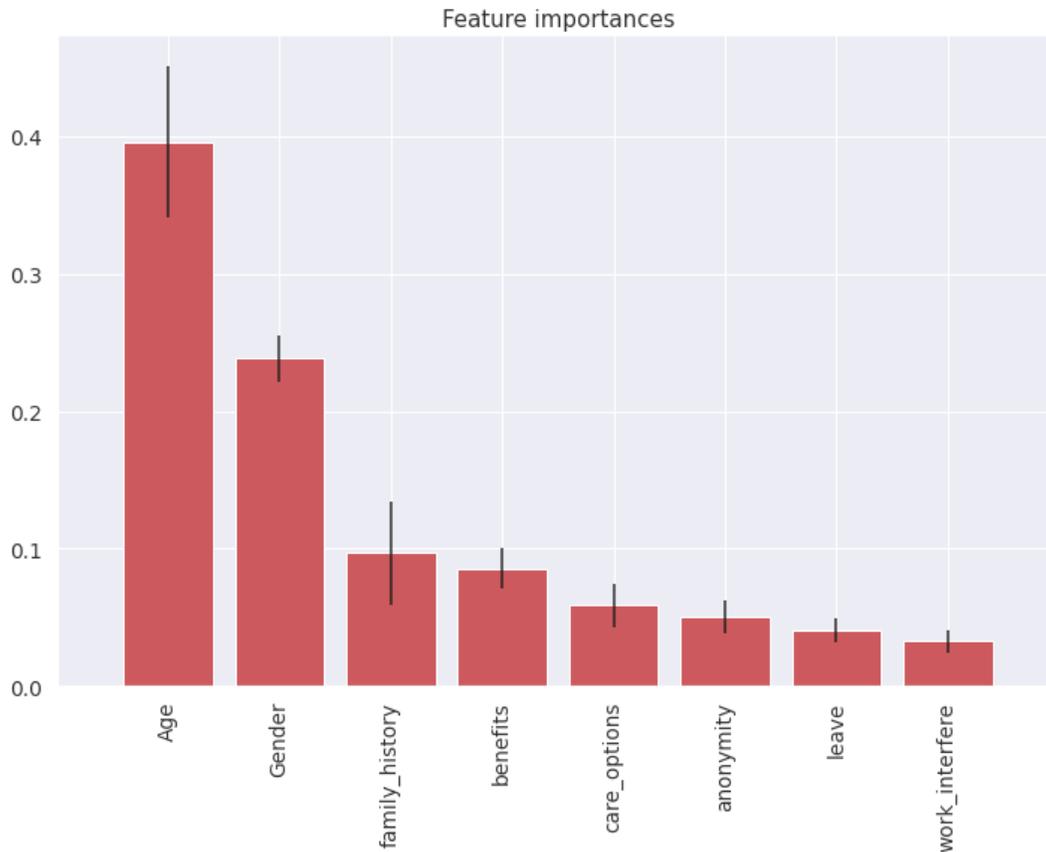


Figure 5.

Model Evaluation

Model Accuracy

After the feature scaling, we built a logistic regression model using the data set and python packages. Here shows the regression output (Figure 6.)

The confusion matrix can help us calculate the True Positives Rates and the False Positives Rates. And later on, the AUC value is calculated by the TPR and FPR values. AUC ranges in value from 0 to 1. A model whose predictions are 100% wrong has an AUC of 0.0; one whose predictions are 100% correct has an AUC of 1.0.

AUC is desirable for the following two reasons:

1. AUC is scale-invariant. It measures how well predictions are ranked, rather than their absolute values.

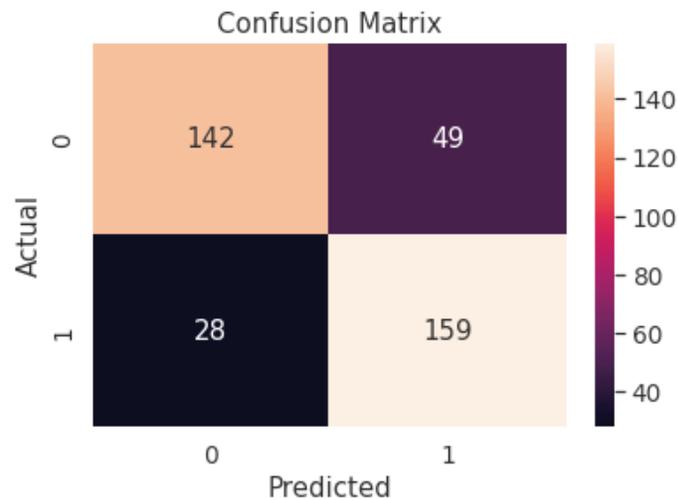
2. AUC is classification-threshold-invariant. It measures the quality of the model's predictions irrespective of what classification threshold is chosen.

Above we see that the AUC value has reached 0.86, which is a very good value indicating that the classifier has strong ability to distinguish the different classes.

```

##### Logistic Regression #####
Accuracy: 0.7962962962962963
Null accuracy:
  0   191
  1   187
Name: treatment, dtype: int64
Percentage of ones: 0.4947089947089947
Percentage of zeros: 0.5052910052910053
True: [0 0 0 0 0 0 0 1 1 0 1 1 0 1 1 0 1 0 0 0 1 1 0 0]
Pred: [1 0 0 0 1 1 0 1 0 1 0 1 1 0 1 1 1 1 0 0 0 0 1 0 0]

```



Classification Accuracy: 0.7962962962962963

Figure 6.

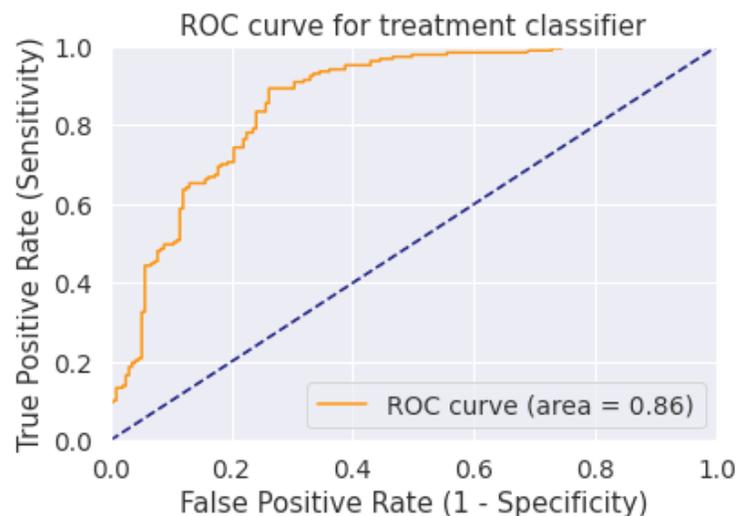


Figure 7.

Model Improvement

Also, our model is currently not perfect. There are several ways to further improve it. First aspect is about the feature engineering. We can conduct some transformation like box-cox or dimension reduction

techniques such as PCA to select the features. Another is about the model complexity. One can add more regularization such as lasso penalty to the original logistic regression.

Conclusion

In summary, we performed logistic regression to classify the mental health condition according to their basic information. We carried out the correlation analysis to find the most important attributes

meanwhile take care of the multi-collinearity. The results show that the model has a pretty good ability to predict the correct classification, with the AUC value reaches 0.86.

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A COVID-19 DATA ANALYSIS IN A STATIONARY TIME SERIES

Abstract. This paper starts with a general discussion regarding the spread of COVID-19 and aims to use R to make regional predictions regarding the virus's spread. We carried out multiple lines of code of time series models using data sets from different countries, specifically New Jersey, United States, and Shanghai, China. We sought to analyze patterns in the virus's proliferation to make future forecasts. The results demonstrate that the model with the coefficients $(1, 0, 0)$ can be useful to forecast the number of COVID-19 cases. This statistical forecast can be helpful for current and future resources allocation and epidemic prevention, as well as epidemiology and disease study.

Keywords: COVID-19; epidemiology; prediction; forecasting; ARIMA model; time series; statistics; public health.

I. Introduction

1.1 Background

The coronavirus SARS-CoV-2 proliferated globally; as of September 2021, countries such as the United States, India, and the United Kingdom have been impacted severely, most noticeably densely-populated cities. Through respiratory droplets from sneezing and coughing, the virus typically incubates for five to seven days at a maximum of fourteen days and causes initial symptoms such as fever, cough, nasal congestion, and fatigue. More symptoms following infection progression include severe chest symptoms and viral pneumonia, accompanied by decreased oxygen saturation, lymphopenia, and elevated inflammatory markers.

COVID-19 was first detected in Wuhan, China in late 2019 [3]. As of March 1, 2020, 79968 patients in China and 7169 patients outside of China have been diagnosed with the virus, and as of November of 2021, 248 million people globally have had COVID-19, with a little over 5 million deaths [2]. Medical professionals consider patients older than sixty years old at higher risk [5] and in February 2020, estimated an average fatality rate of approximately 2.2% [7], which depends on factors

such as age and immunity. Aside from posing as an international public health danger, COVID-19 has also impacted other aspects of society, including education, legal proceedings, and work life — this research itself has been conducted virtually due to the pandemic. The pandemic has been an offset to the sense of normalcy; hence, this research's objective is to determine data that may help community health services to keep the pandemic's spread to a minimum.

1.2 Research Objectives

This research analyzes the number of COVID-19 cases for various countries and its progression based on the number of forecasted cases in 2020. By focusing specifically on New Jersey and Shanghai, mathematical analysis can potentially develop models, which can forecast the number of cases in a certain amount of days. With such tools, government officials would be able to estimate the severity of COVID-19 in the future and implement necessary protective procedures or medical supply distributions to maintain the spread of the virus to a minimum and assist marginalized and underprivileged communities, as well as analyze the progression of the virus's proliferation visually.

II. Methodology

2.1 Dataset Overview

The training dataset consists of six columns: Forecast ID, province/state, country region, date of record, confirmed cases, and fatalities. Each row lists a unique identifier, the specific region of the country (if applicable), the country itself (which is organized in alphabetical order), and the number of confirmed cases and fatalities on that day. As time passes, the number of COVID-19 cases clearly increases with time. This research applies the training dataset to creating and training an initial model for forecasting COVID-19 cases.

The validation dataset records data for four columns: Forecast ID, province/state, country region, and date of record, each row with a unique identi-

fier for every day, correlating with the data from the training dataset. Using the validation set fine-tunes the model to handle future data. From what we can see, as time passes, the number of forecasted cases increases.

The testing dataset displays three columns recording the number of forecasted COVID-19 cases, the number of confirmed cases, and the number of fatalities. By running this test data through the model, we can see how accurate the predicted outputs are.

Shown is the data visualization plot of the training set comparing the increase of confirmed cases and fatalities globally. The number of confirmed cases increased much faster than the number of fatalities. Particularly, after mid-March of 2020, the number of confirmed cases spiked rapidly.

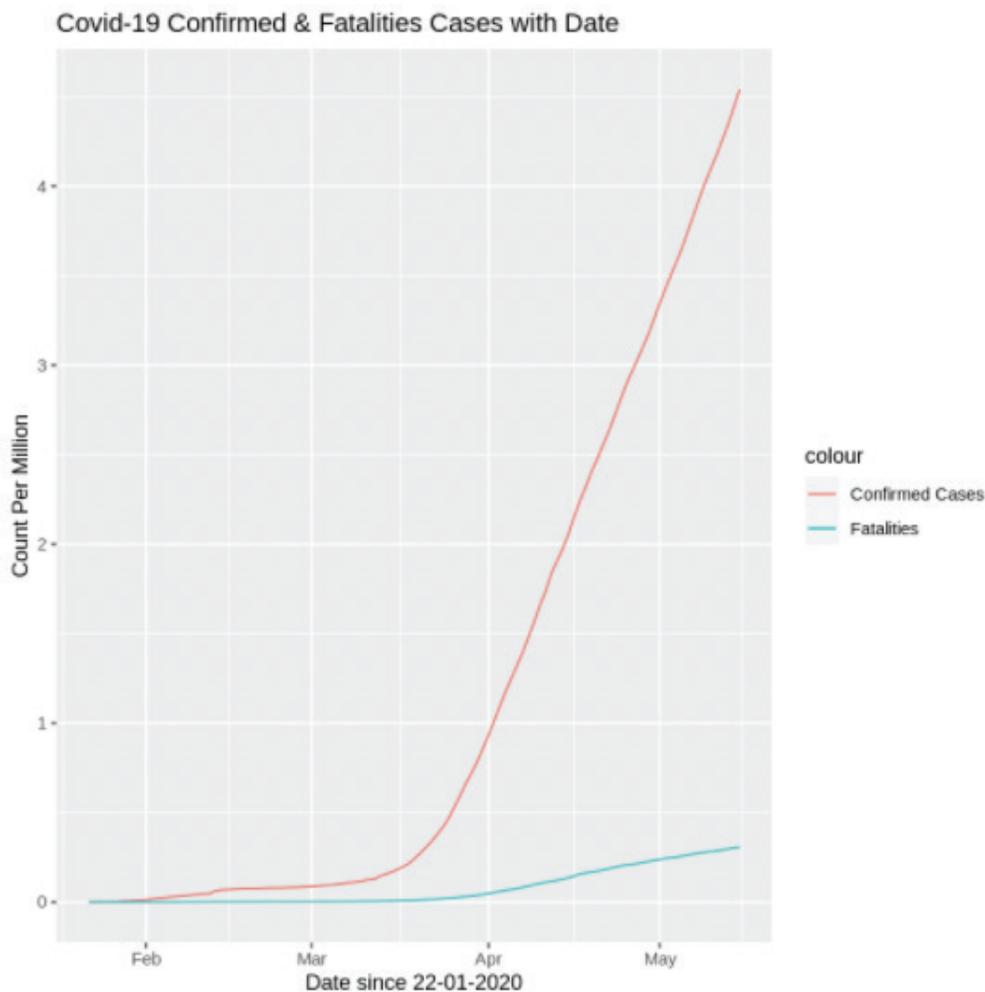


Figure 1. Count of COVID-19 cases

Below, dotted visualization of the progression of confirmed cases in several different countries from the training set is presented. As shown with the steep-sloped pink line representing the U.S, there is a far more significant increase in confirmed COVID-19 cases. Earlier in 2020, in February, the number of confirmed cases in China seemed to increase quite a bit before leveling off for the duration of March to May. Towards the latter half of March,

however, the United States especially experienced a far more severe increase in confirmed cases, correlating with the visual above. The number of confirmed cases in countries including Italy, Iran, South Korea, and Germany also appear to increase sharply, though less than U.S., around the end of March, which could explain how the number of confirmed cases globally proliferated around that period of time.

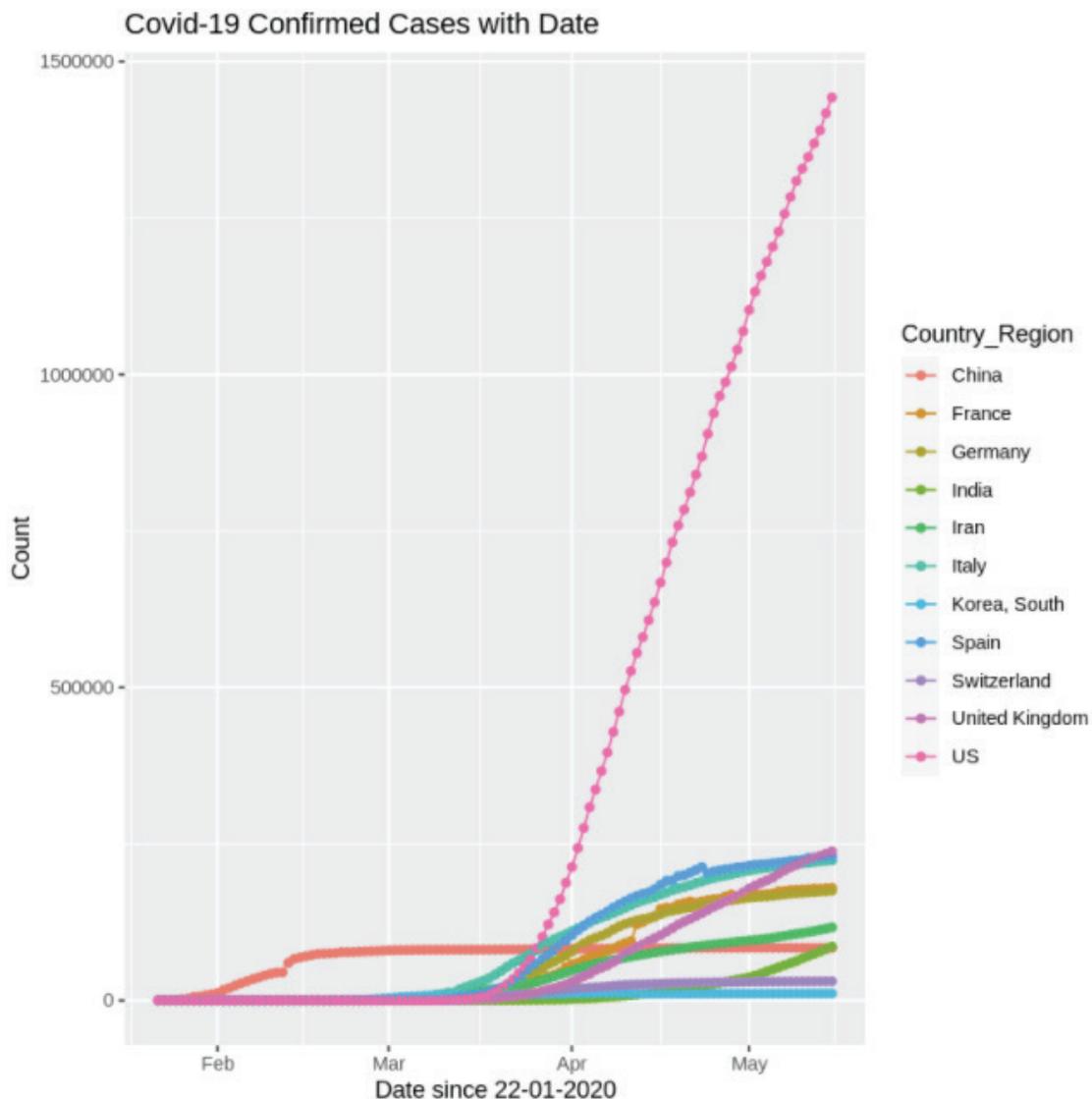


Figure 2. COVID-19 progression by region

The last visualization exhibited is a bar graph comparing the number of confirmed cases and fatalities in several countries. Both the number of con-

firmed cases and the number of fatalities in the U.S. were significantly higher than those of other countries.

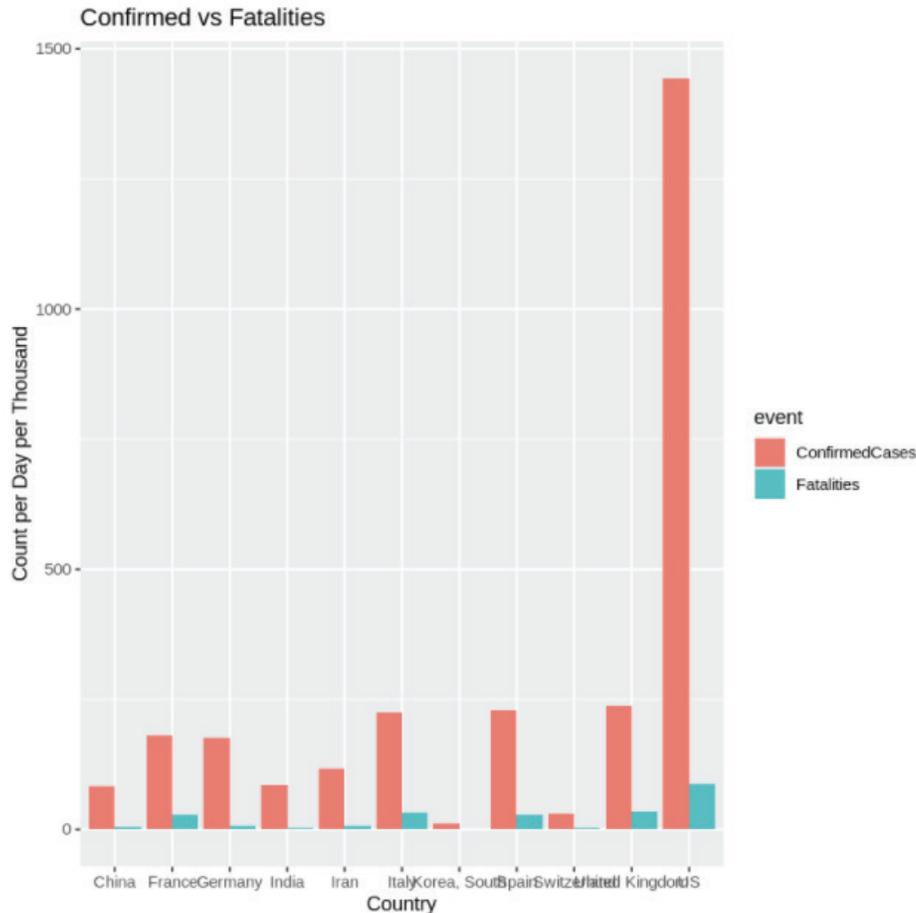


Figure 3. Comparison of confirmed cases and fatalities by region

2.2 The Importance of a Stationary Series

For this paper, a normal time series is not sufficient since if used, the model and its variance would be a function of time. As time passes, each nation's COVID-19 case count will increase, but the ratio of confirmed cases and death cases varies a lot among different countries. Although a visualization of this information could display trends and the degree of severity of disease proliferation, its reliability in predicting the number of future cases is subpar.

This research will analyze a stationary time series, which are what most forecasting methods are designed for, and measure the autocorrelation — the constant relationship between a variable's current value and past values.

2.3 Time Series Models and Predictions

This research will construct ARIMA models (autoregressive integrated moving average) to

forecast the number of COVID-19 cases, which can be made stationary by differencing. An ARMA model is a combination of the aspects of AR (autoregressive) models, which utilize previous data values to predict future values, and MA (moving average) models, which remains constantly stationary, and alongside integration [4]. This type of model is most suitable since it is a general class of forecasting models that can be transformed to be stationary through differencing, logging, or deflating.

Focusing on New Jersey, United States, and Shanghai, China, the research aims to predict the number of COVID-19 cases in those regions in the future. By focusing on regions in two different continents, the research also hopes to investigate the inevitable effects of different population densities on the local proliferation of COVID-19.

III. Implementation

3.1 Model Construction

Via R Studio, two separate models were generated for Shanghai, China and New Jersey, United

States. The datasets were first cleaned up to ensure each row had a “providence” name just for consistency. Specifically, here is what was yielded for the first few rows of the data after cleaning it up:

```
> head(covid_training_dataset)
  Id Province_State Country_Region      Date ConfirmedCases Fatalities
1  1   Afghanistan   Afghanistan 2020-01-22           0           0
2  2   Afghanistan   Afghanistan 2020-01-23           0           0
3  3   Afghanistan   Afghanistan 2020-01-24           0           0
4  4   Afghanistan   Afghanistan 2020-01-25           0           0
5  5   Afghanistan   Afghanistan 2020-01-26           0           0
6  6   Afghanistan   Afghanistan 2020-01-27           0           0
> tail(covid_training_dataset)
  Id Province_State Country_Region      Date ConfirmedCases Fatalities
35990 35990      Zimbabwe      Zimbabwe 2020-05-10           36           4
35991 35991      Zimbabwe      Zimbabwe 2020-05-11           36           4
35992 35992      Zimbabwe      Zimbabwe 2020-05-12           36           4
35993 35993      Zimbabwe      Zimbabwe 2020-05-13           37           4
35994 35994      Zimbabwe      Zimbabwe 2020-05-14           37           4
35995 35995      Zimbabwe      Zimbabwe 2020-05-15           42           4
```

Figure 4. Displayed below are the first and last six rows of the training dataset with the “Province_State” heading filled in, as in the original dataset, it was missing

Afterwards, the model to forecast COVID-19 cases in Shanghai was created with the Arima() function of the training dataset to forecast the number of confirmed COVID-19 cases in 43 days, which was rooted from April 2nd, 2020. Specifically, an ARIMA model with the coefficients of (1, 0, 0) were used to formulate the predictions because it is considered to be “first-order”, and due to the consistently increasing nature of the COVID-19 cases, it could

be assumed that a multiple of the previous entry alongside an additional constant would suffice as a mathematically-based prediction.

Afterwards, with the print() function, the program printed out the results of the formula in a table similar to that of the dataset’s format, except the output produced the predictions that resulted from the ARIMA model. Below, the first view rows of these predictions are shown:

```
ForecastId Province_State Country_Region      Date ConfirmedCases_predict ConfirmedCases Fatalities
1      3398      Shanghai      China 2020-04-02           3           1           1
2      3399      Shanghai      China 2020-04-03           1           1           1
3      3400      Shanghai      China 2020-04-04           1           1           1
4      3401      Shanghai      China 2020-04-05           1           1           1
5      3402      Shanghai      China 2020-04-06           0           1           1
6      3403      Shanghai      China 2020-04-07           2           1           1
ForecastId Province_State Country_Region      Date ConfirmedCases_predict ConfirmedCases Fatalities
1      11525   New Jersey      US 2020-04-02           707           1           1
2      11526   New Jersey      US 2020-04-03          1592           1           1
3      11527   New Jersey      US 2020-04-04           268           1           1
4      11528   New Jersey      US 2020-04-05          1399           1           1
5      11529   New Jersey      US 2020-04-06          1542           1           1
6      11530   New Jersey      US 2020-04-07           806           1           1
```

Figure 5. The first 6 rows of the predictions generated by the ARIMA model for Shanghai, China, and New Jersey, United States (respectively) starting April 2nd, 2020. This was generated by the head(result) function

IV. Results

4.1 Model Limitations:

While these models demonstrate reasonable accuracy, they are restricted. The model parameters are targeted for a specific region or country. This research only designed them for two regions in two different countries, which is rather small-scaled compared to the rest of the world. The data produced would not apply for other countries and therefore would not be useful for government officials of other nations to use to enforce disease control or regulations in their own regions. Factors that vary between regions such as population density of certain cities and the number of vaccines available per country are why a model based on data from one country cannot apply to another.

Secondly, the research constructed the models based on data from January 2020. The models are not fully up-to-date, and since the pandemic is not yet over, there is not much data processed for more recent days. The number of COVID-19 cases would become unpredictable without the most recent data, but more time-series construction can be done. The COVID-19 pandemic is also quite similar to the SARS (severe acute respiratory syndrome) pandemic in terms of origin, having rooted from a coronavirus, and the statistics between these two pandemics could be compared, though it is noted that these two pandemics occurred at different times and that scientific research, technology, and communications has advanced over the decade, accounting for the differences in the mortality rates and spreads of these diseases. Especially with the rising of the Omicron variant, which is more transmissible, data from early 2020 fails to take that increase in proliferation into consideration, deeming the models as less up-to-date.

In the future, there ought to be more region-specific analyses throughout the world not limited to the two regions below, in which health officials could also utilize other forms of data analysis, potentially opening up a forecasting database.

4.2 Potential Model Applications

This research shows that ARIMA models can generate useful data about the potential COVID-19 case count and the fatalities. With a method of generating predictable data, governments can potentially collaborate with statistic and epidemiological professionals internationally to generate large databases providing information about the future of the virus's proliferation in certain regions. Healthcare officials can also use the calculated predictions as means to determine which nations have the fastest COVID-19 proliferation rates or fatality rates, keeping international organizations such as World Health Organization (WHO) and the Red Cross informed and possibly ready to take action if needed. Furthermore, if governments choose to make these databases public, citizens can remain well-informed regarding control protocol and safety and can make necessary arrangements.

The predictions estimated by the models are also useful to estimate the amount of vaccines/medical supplies needed for certain locations. For instance, in Burundi, the minister of health had approved the first order of COVID-19 vaccines to be distributed in late July following a rise in the spread of infectious variants [1]. Data such as the predicted number of COVID-19 cases generated by the model can forecast the virus's proliferation and can even be applied to new variants, such as the Omicron variant. This variant has already spread to more than six U.S. states, and such models can be applied in different locations so that authorities can identify areas that are most threatened and implement any necessary measures.

V. Conclusion

The number of COVID-19 cases per region may vary since China and New Jersey, two different regions, show different numbers of COVID-19 cases. Since that is the case, it may be harder to predict the number of cases in all of the regions holistically. Hence, creating two separate forecasts for two separate regions would provide authorities in each of those areas with more precise information.

While the models are reasonably accurate and can be used for data collection, revisions are imperative. As the Omicron variant becomes more prevalent and is said to be more easily transmissible, new data should be added to create new models that can predict the number of confirmed cases relative to the

proliferation rate at the time. Since many universities and other public institutions are already going remote, it is a crucial time for this model to be considered as a means to plan ahead for another potential period of quarantine.

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Section 4. Psychology

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SELF-PERCEIVED VS ACTUAL WEIGHT STATUS: WHICH IS A STRONGER PREDICTOR OF ADOLESCENTS' SUICIDE INTENT?

Abstract

Objective: This study aims to examine if actual or self-perceived weight status plays an important role in predicting adolescents' suicide intent.

Methods: Data from the Youth Risk Behavior Surveillance System (YRBSS) 2017 was used. Three methods were used to compare the role of actual and self-perceived weight status in associating with suicide intent: bivariate analysis; two Logistic regression models using Akaike information criterion (AIC) and receiving operating characteristic (ROC) /Area under the ROC Curve (AUC) as metrics to measure if the model is a good fit; a Logistic regression model with both types of weight status to examine statistical significance.

Results: About 17% participants reported ever considering suicide. In bivariate analysis, it seems that discrepancies in suicide intent proportion is larger based on self-perceived weight status groups than that based on actual weight status groups. The model with perceived weight status has lower AIC and higher AUC than the model with actual weight status, indicating that the former is a better fit. In the model with both weight status variables, perceived weight status are statistically significant (p -values <0.05), while actual weight status groups are statistically insignificant (p -values >0.05).

Conclusion: Overall, the proportion of high school students who ever had suicide intent is high. Self-perceived weight status plays a more important role of predicting suicide intent than actual weight status.

Keywords: suicide intent, weight status, Logistic regression.

1. Introduction

In this study, we aimed to explore if BMI is related to adolescents' suicide intent, using data of a nationally representative sample from the Youth Risk Behavior Surveillance System (YRBSS). Specifically, we compared adolescents' actual weight status with their self-perceived weight, and examined which one is a stronger predictor of suicide intent.

2. Research methods

2.1 Data source

The YRBSS was developed in 1990 by the Centers for Disease Control and Prevention (CDC), aiming to monitor health-related behaviors that contribute to deaths and disabilities among youth and adults. It includes national, state, territorial, tribal government, and local school-based surveys of rep-

representative samples of students in 9th through 12th grade. These surveys are conducted every two years.

YRBSS monitors six categories of health-related behaviors:

Behaviors that contribute to unintentional injuries and violence;

Sexual behaviors related to unintended pregnancy and sexually transmitted diseases, including HIV infection;

Alcohol and other drug use;

Tobacco use;

Unhealthy dietary behaviors;

Inadequate physical activity.

For this study, we used the most recent data from year 2017. This year's data included a total of 14,765 students in 9th through 12th grades.

2.2. Variables of interest

Variables on suicide intent

In the survey, students were asked "During the past 12 months, did you ever seriously consider attempting suicide?" responses were yes or no.

Variables on weight status

Actual weight status:

Students' height and weight information was collected through two questions: How tall are you without your shoes on? How much do you weigh without your shoes on? The corresponding BMI and BMI percentile for his/her age and gender were then calculated in the YRBSS data.

Based on the percentile, we then categorized adolescents actual weight status into four categories, based on CDC standard [1].

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Normal or Healthy Weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	95th percentile or greater

According to literature, BMI does not measure body fat directly, but it is correlated with and can be considered an alternative to direct measures of body fat, such as skinfold thickness measurements ².

Self-perceived weight status:

Students were asked "How do you describe your weight?", with the following answer options:

A. Very underweight;

B. Slightly underweight;

C. About the right weight;

D. Slightly overweight;

E. Very overweight.

2.3 Statistical Analysis

I first described the study sample's profile of demographics, weight status, and suicide intent, using mean values for continuous variables (e.g., age) and percentages for categorical variables (e.g., gender).

To decide on if actual or self-perceived weight status is a better predictor, we looked at the following:

Crude/bivariate association between actual or self-perceived weight status and suicide intent

Compare two Logistic regression models, one with actual weight status and the other with self-perceived weight status, respectively, to see which model provides a better prediction of suicide intent. using Akaike information criterion (AIC) and receiving operating characteristic (ROC) [3; 4].

AIC is a measure of the relative quality of a statistical model for a given set of data. As such, AIC provides a means for model selection. The absolute value of AIC is less of focus. Its main usage is to compare in-sample fit of the candidate models. The lower AIC, the better a model is [5].

ROC is a measure of classifier performance. It is a graphic that shows the diagnostic ability of a model in predicting binary outcome as its discrimination threshold is varied. Ultimately, the focus is the area under the ROC curve, or AUROC. AUROC ranges from 0.50 to 1.00, and the higher AUROC, the better the model is. It should be noted, however, that in this study, the purpose is to compare which model

has a higher AUROC, instead of the absolute values of AUROC.

A logistic regression including both actual and self-perceived weight status.

A detailed explanation of Logistic Regression Model

Logistic Regression Modeling is a popular analytic technique to analyze the association between a set of predictors and a binary outcome. In the model, “suicide intent” (yes/no) is the outcome “y”. Actual or self-perceived weight status is the explanatory variable/predictor of interest.

In order to control for potential confounding effects of variables including age, gender, race, and academic performance, we included these variables in the Logistic regression models.

The general formula of logistic regression is:

$$\ln(\text{odds of an event occurring}) =$$

$$\ln\left(\frac{P}{P-1}\right) = \beta + \beta_1 \times X_1 + \beta_2 \times X_2 + \dots + \beta_n \times X_n.$$

P – is the probability of an event, which is convertible with odds. X_n – is a predictor variable, and β_n – is a regression coefficient. The relationship between the odds ratio and the coefficients is $OR = e^\beta$.

If the coefficient β of a variable X_n is larger than 0, X_n – is related to a higher odds/probability of the event. The odds ratio related to X_n is above 1 in this case.

If the coefficient of a variable X_n is equal to 0, X_n is not related to the event. The odds ratio related to X_n is equal to 1 in this case.

If the coefficient of a variable X_n is smaller than 0, X_n is related to a lower odds/probability of the event. The odds ratio related to X_n is below 1 in this case.

3. Results

3.1 Demographic profile of the study sample

After limiting to non-missing values of the key variables, the final study sample included 9,514 high school students.

The average age was 16 years. 51% were females and 49% were males. Students were proportionately from each grade of 9, 10, 11, and 12, with around 25% from each grade. In terms of race/ethnicity, the study sample included 47% Whites, 16% African Americans, 11% Hispanic/Latino, and others.

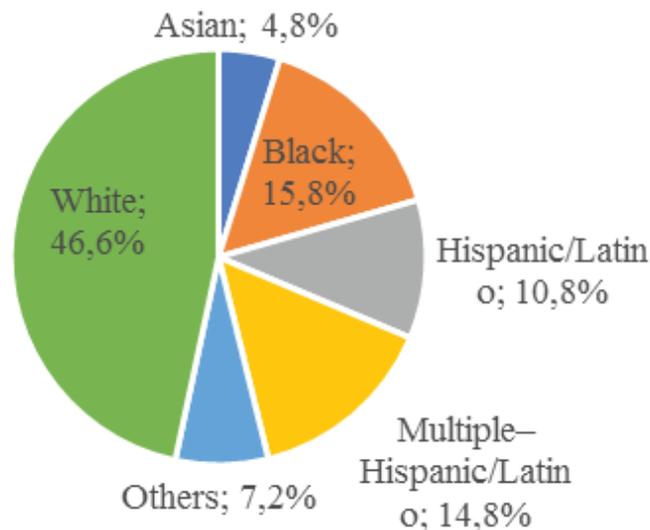


Figure 1. Racial/ethnic composition of the study sample

3.2 Descriptive results on students’ suicide intent and weight status

Overall, 17% reported that they ever seriously considered attempting suicide during the past 12

months. The rate is two times higher in girls than in boys.

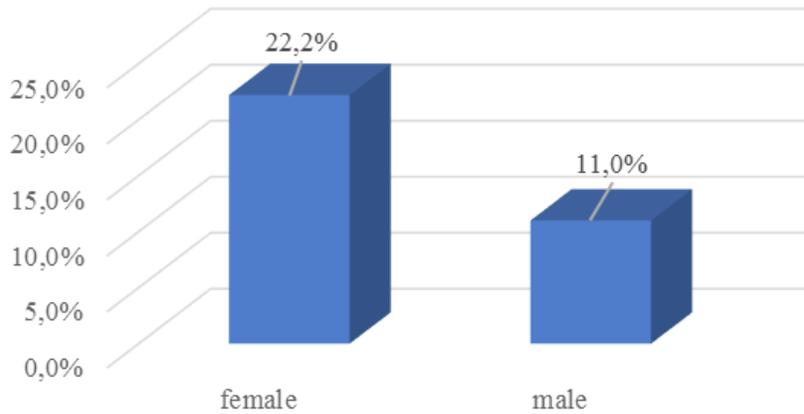


Figure 2. Proportion of considering suicide by gender

A majority (66%) is considered as normal weight based on their BMI percentile. 16.4% and 14.7% are in the overweight and obese categories.

However, when looking at self-perceived weight status, only 53% perceived themselves as “about right weight”. 31.8% perceived themselves as slightly or very overweight.

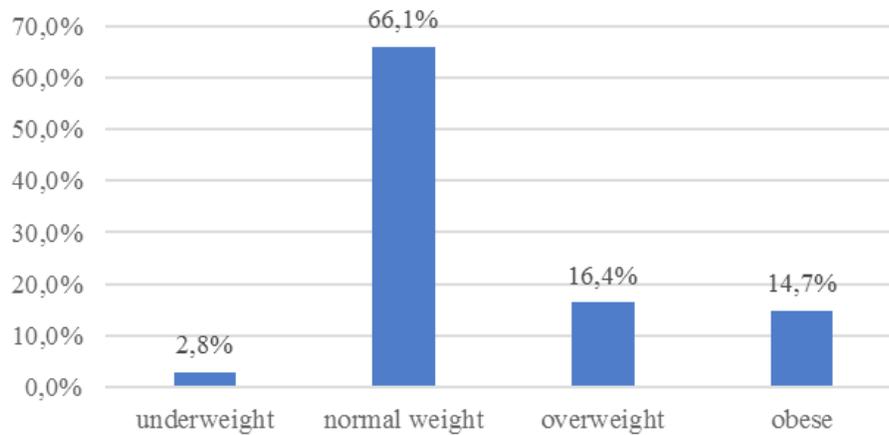


Figure 3. Actual weight status

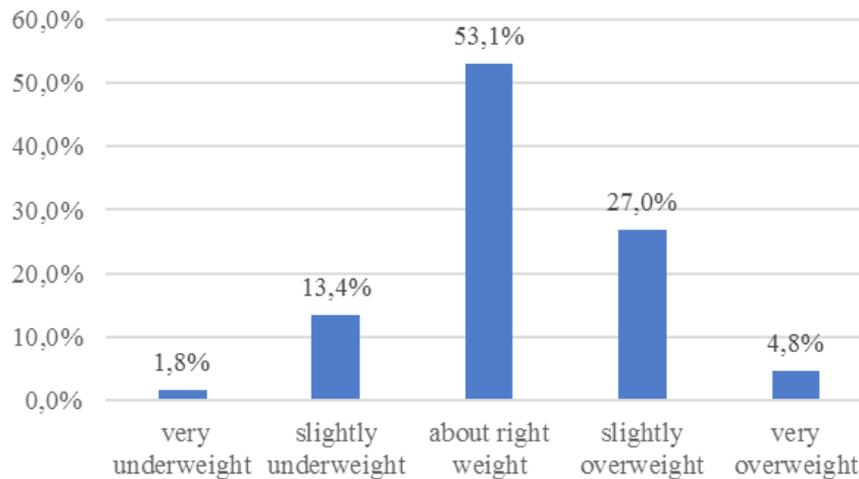


Figure 4. Perceived weight

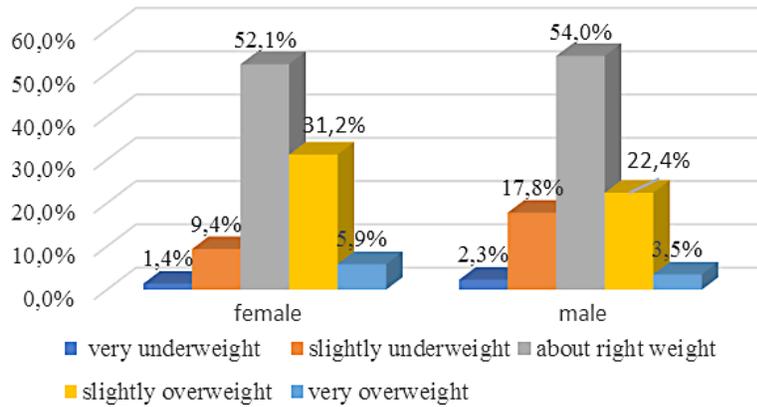


Figure 5. Perceived weight by gender

Compared with boys, girls are more likely to perceive themselves as slightly or very overweight. Discrepancies between actual and perceived weight status:

Table 1.

actual weight status	perceived weight status			
	very underweight	slightly underweight	about right weight	slightly overweight
underweight	19.0%	51.5%	27.2%	1.5%
normal/heavy wt	1.6%	17.4%	67.1%	13.0%
overweight	0.6%	1.5%	36.6%	56.2%
obese	0.8%	1.4%	13.3%	61.9%

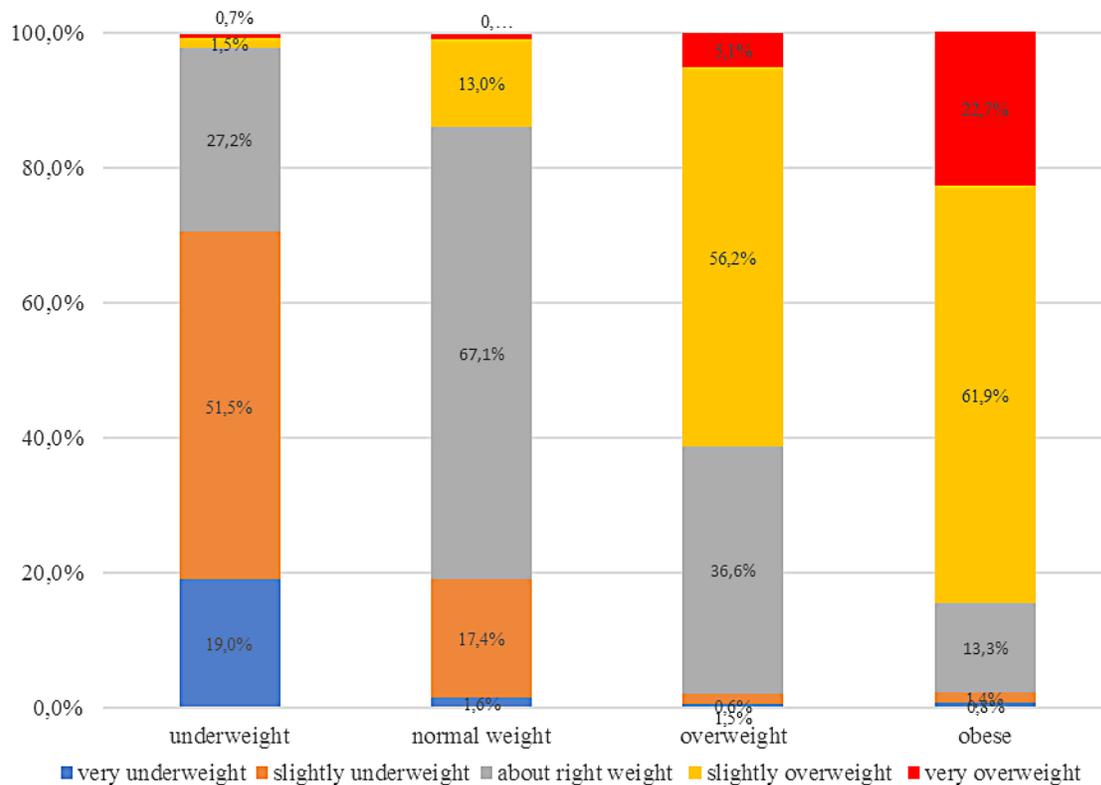


Figure 6. Perceived weight by actual weight stat

3.3 To compare which is a stronger predictor of suicide intent

1) crude relationship between weight and suicide attempt

It can be seen that the discrepancies in suicide intent proportion is larger based on self-perceived weight status groups than that based on actual weight status groups.

Table 2.

Actual weight status	considered suicide	
	yes	no
underweight	17.9%	82.1%
Normal weight	15.4%	84.6%
overweight	19.5%	80.5%
obese	20.2%	79.8%
From Chi-sq test: P value <0.0001		
Perceived weight status	considered suicide	
very underweight	24.1%	75.9%
slightly underweight	16.8%	83.2%
about right weight	12.5%	87.5%
slightly overweight	22.0%	78.0%
very overweight	33.2%	66.8%
From Chi-sq test: P value <0.0001		

2) Comparison of models

Model with only confounders:

$$\text{Log(odds of suicide intent)} = b_0 + b_1 \times \text{age} + b_2 \times \text{grade} + b_3 \times \text{academic performance} + b_4 \times \text{race / ethnicity}$$

$$\text{AIC} = 8299.9, \text{AUC} = 64.5\%$$

$$\text{Log(odds of suicide intent)} = b_0 + b_1 \times \text{age} + b_2 \times \text{grade} + b_3 \times \text{academic performance} + b_4 \times \text{race / ethnicity} + b_5 \times \text{actual weight status}$$

$$\text{AIC} = 8273.4, \text{AUC} = 65.3\%$$

$$\text{Log(odds of suicide intent)} = b_0 + b_1 \times \text{age} + b_2 \times \text{grade} + b_3 \times \text{academic performance} + b_4 \times \text{race / ethnicity} + b_5 \times \text{perceived weight status}$$

$$\text{AIC} = 8145.1, \text{AUC} = 67.1\%$$

It can be seen that the model with perceived weight status has lower AIC and higher AUC than the model with actual weight status. Both indicate that the former is a better fit.

3) Logistic Regression model with both variables

In logistic regression, after controlling for potential confounders of age, gender, grade, race/ethnicity, and academic performance, the regression coefficients for perceived weight status are statistically significant (p-values <0.05). On the other hand, the regression coefficients for actual weight status groups are statistically insignificant (p-values >0.05).

Table 3.

Results from Logistic regression model								
	Estimate	Std. Error	z value	Pr(> z)		Odds Ratio	Lower CI	Upper CI
Intercept	-2.07264	0.41707	-4.97	<0.0001	***	0.125	0.0554	0.284
Perceived weight status								
reference: About the right weight								
slightly overweight	0.66111	0.07727	8.556	<0.0001	***	1.936	1.6645	2.253
slightly underweight	0.45202	0.09028	5.007	<0.0001	***	1.571	1.3146	1.873
very overweight	1.27074	0.1316	9.656	<0.0001	***	3.563	2.7505	4.608
very underweight	0.88136	0.19745	4.464	<0.0001	***	2.414	1.623	3.525
Actual weight status								
reference: normal weight								
obese	-0.16852	0.09969	-1.691	0.09093		0.844	0.6942	1.026
overweight	0.00039	0.0856	0.005	0.99641		1	0.8449	1.181
underweight	0.06309	0.17709	0.356	0.72165		1.065	0.7454	1.494
age	0.06217	0.05095	1.22	0.22231		1.064	0.963	1.175

Gender: male vs. female	-0.87447	0.06191	-14.125	<0.0001	***	0.417	0.3691	0.47
Grade	-0.05905	0.05616	-1.052	0.29301		0.942	0.8444	1.052
Academic_performance								
reference: A								
B	0.18699	0.06664	2.806	0.00502	**	1.205	1.058	1.373
C	0.47798	0.08313	5.75	<0.0001	***	1.612	1.3695	1.897
D	0.97019	0.14883	6.519	<0.0001	***	2.638	1.9622	3.519
E	1.02645	0.23207	4.423	<0.0001	***	2.791	1.7489	4.356
Race/ethnicity								
Reference: Asian								
Black	-0.32319	0.15243	-2.12	0.03398	*	0.723	0.5388	0.98
Hispanic/Latino	-0.67955	0.16515	-4.115	<0.0001	***	0.506	0.3673	0.702
Multiple– Hispanic/Latino	-0.05398	0.14862	-0.363	0.71646		0.947	0.7109	1.273
Others	0.27171	0.16099	1.688	0.09146		1.312	0.9597	1.805
White	0.01601	0.13522	0.118	0.90574		1.016	0.7838	1.332

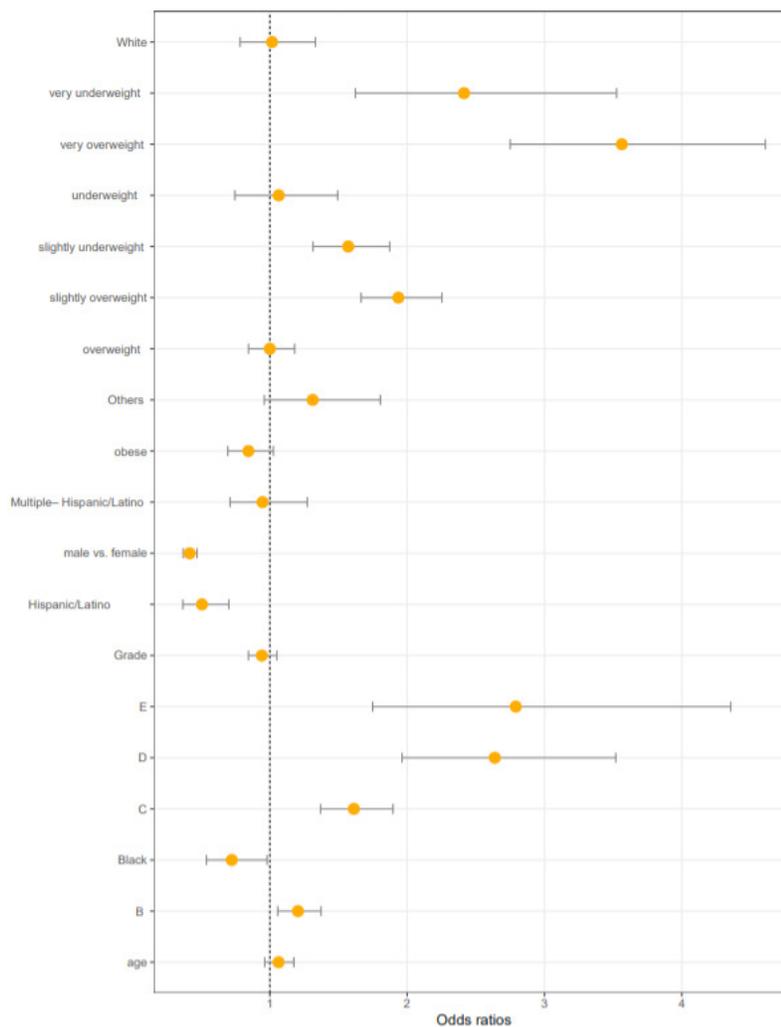


Figure 6. Results from Logistic registic regression modeling

4. Discussion

The percentage of high school students who ever considered suicide was 17%. This is an alarming number, showing importance of attention to adolescents' psychological health. Meanwhile, girls are more likely to have suicide intent than boys.

All the three methods indicate that self-perceived weight status is a stronger predictor of suicide intent than actual weight status. This is similar with another study using the YRBSS data which finds that weight perception plays a more important role in affecting adolescents' weight-loss intentions and

behaviors. Specifically, they found that "irrespective of the weight status base on self-reported weight and height, adolescents who perceive themselves as overweight have a stronger intention to lose weight, but do not develop better eating and exercise habits, compared with their counterparts of same gender and reported weight status" [6].

5. Conclusion

Overall, the proportion of high school students who ever had suicide intent is high. Self-perceived weight status plays a more important role of predicting suicide intent than actual weight status.

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Section 5. Regional studies

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IS FAITH ANYTHING OTHER THAN UNCERTAIN BELIEF ON INCOMPLETE EVIDENCE?

Abstract. This essay shall attempt to navigate through this ambiguous argument of faith's veracity, from both a theological standpoint, by naming and analyzing faith based on a model of incomplete evidence, complemented with a more secular account. Furthermore, this essay will strive to demonstrate that Faith can be both something more and less of incomplete evidence: in the believer's eyes, any evidence could stand as sufficient or incomplete.

Keywords: faith, religion, humanity, Atheism, theology, Christianity.

The idea of faith has existed in one way or another throughout the history of human culture. Dating back to the dawn of humanity, faith is a universal feature that appears in daily life and religious systems. However, faith's nature has been consistently questioned. From a universal standpoint, faith comes from memory and previous experience. Nevertheless, where does faith come from religiously?

The notion of religious faith being a requirement in order to find favor in His eyes and enter the Promised Land on the day of the Last Judgment has been repeatedly accentuated throughout the Holy Bible. The Bible's definition of Faith can be found in Hebrews 11:1: "Now faith is the substance of things hoped for, the evidence of things not seen." [1] This excerpt of the Bible identifies faith as an ethereal concept, one that is "not seen." Consequently, this raises much controversy in the atheist's eyes. The atheist argues that with faith's qualities of invisibility and prospectiveness being such a salient notion in the Bible, it can be deemed that the fundamentals of the faith are misleading, and it is built upon insufficient evidence. The arguments made to invalidate faith's nature are as follows:

1. The grounds of faith come from the holy texts.
2. Some gospels & texts have been excised from the original text centuries ago.
3. The contemporaneous version of the Bible do not convey the original concepts due to incomplete texts.
4. Faith is supported by incomplete evidence.

This essay shall attempt to navigate through this ambiguous argument of faith's veracity, from both a theological standpoint, by naming and analyzing faith based on a model of incomplete evidence, complemented with a more secular account. Furthermore, this essay will strive to demonstrate that Faith can be both something more and less of incomplete evidence: in the believer's eyes, any evidence could stand as sufficient or incomplete.

I. Theology

Considering the question from a theological standpoint, it may be worthwhile to determine the model of faith [2] in which the question casts doubt. After deliberation, one may ascertain that the model which best fits the question is the doxastic venture, defined as "*faith as practical commitment beyond the*

evidence to one's belief that God exists" [2]. To illustrate this concept, consider the following excerpt of the Bible: "For God so loved the world that he gave his only Son, so that everyone who believes in him might not perish but might have eternal life" [3]. God promises ultimate and eternal life and safety, yet it may be exigent for one to invest in the promise of God when there is no factual evidence that the receiver of faith exists. In this case, the believer may autonomously venture to find reasons beyond existing evidence to press them into faithfully believing that such a God exists and can be relied on.

The aforementioned model of faith allows for theologians to glean and conjecture that although these self-envisioned "evidence" substantiate God's existence and justify faith in the believer's eyes, no concrete contribution is made to the validation of His existence. Nevertheless, there can be one singular working proof of God's existence for every singular believer of God: one may draw upon the holy texts and reference the destruction of cities and the tower of Babel to demonstrate God's existence and divinity, legitimizing their faith, yet receiving a critique that no conclusive proof shows such events happened in history; others may draw on commonplace "miracles" that are happening to elucidate their faith, viz. the holy texts surviving a fire that incinerated the church which treasured it, despite being ridiculed due to the excellent fire prevention done to the church. For each follower of God, there is one remarkable proof that explains their faith.

The holy texts demand faith from the acolytes of their religion, yet do not offer them the necessary evidence to support their faith, even to his most loyal subordinate, Moses. After Moses pleads Him to "show...glory," God simply responds with "...when my glory passes by, I will... cover you with My hand until I have passed by. Then I will take My hand away, and you will see My back; but My face must not be seen" [4, Exodus 33:22]. As a celebrity blocking the camera pointing to His face, He refuses to show His face to even his most unwavering prophet. Yahweh

recognizes this act as Him showing glory to Moses and presumes that Moses acknowledges this as evidence that he and his people "found favor" in His eyes. Nevertheless, in many other instances, such as Jeremiah 18:17, He refers to the sight of his back as disastrous: "I will show them My back and not My face in the day of their calamity." [4, Jer. 18:17] When Moses, one of the most faithful mortals at the time, could only behold the back of God which may insinuate divine retribution, it can be deduced that those who are less prominent or have not "found favor" in His eyes perceive even less evidence that supports the deity's divinity. Aside from God (if He truly exists)'s bashful attitude apropos of His disciples, the cogency of biblical events has also been of criticism.

The tale of the Decalogue, for instance, have various versions and interpretations for different Abrahamic Religions. Nevertheless, when considering the Ten Commandments from an atheist perspective, alternative explanations can be projected to interpret Moses' actions. After glimpsing the golden calf that broke the commandment, "...his anger burned and he threw the tablets out of his hands, breaking them to pieces at the foot of the mountain" [4, Ex. 32:19]. This passage of Moses filling in the role of an iconoclast could hold a sundry of meanings, nonetheless, the indisputable fact presented is that the original covenant is lost. For conspiracists, incertitude can be cast on Moses' actions: since no one else bore witness to the original contents of the Decalogue, Moses could have easily altered the gist of the tablet to change its meaning altogether. As such, the credibility of the Bible is largely questioned. Nevertheless, even if the credibility is questionable to some, is it the same for others? For a zealot of the religion, does this "controversial" evidence hold the same weight as it does for a scholar? Perhaps not. The individuality of faith allows for different levels of significance for different believers. Although for the conspiracists this is but a piece of incredible evidence, for others this may be the cornerstone of their faith.

II. Atheism and Secular Concepts of Faith

An atheist would often argue that creationism is an irrational story, and draw upon the big bang theory, Naturalism and Darwinism as part of the reasoning. The atheist would argue that archeological evidence shows that the lives on earth right now remain and prosper through random choices of nature and natural selection, along with evolutions that happened across centuries. According to atheism, this would subsequently prove creationism as erroneous and ludicrous; some atheists would even go as far as describing faith as “an assertion of unreasonable conviction against all reason” [5]. Albeit this statement represents a radical side of atheism, the core of the statement is not illogical. “Let your faith supplant reason. Abraham mastered reason by faith in the Word of God” [6]. This quote in Rev. Martin Luther’s commentary states that faith and reason have no correlation to each other and are utterly incompatible. In both quotes, faith and reason see each other as a great scourge and seek to oust one another. Nevertheless, a counterargument can be offered on whether Darwinism is genuinely rational or not.

“Atheism is an arbitrary and irrational blind faith (i.e., without evidence) all the while dressed up as being reasonable” [7]. The thought process which drives this counterargument is the philosophy of Naturalism itself. “Our brains were shaped for fitness, not for truth,” [8, 305]: If humans were simply made from random evolutions, and the human brain is composed of a series of random chemicals, then how are we to trust our brains in terms of the information that it provides when the brain gives us the knowledge to survive, not reason? Albeit this argument may sound coherent at first glance, there is a fundamental flaw in its philosophy: in metaphysical naturalism, nature only operates on physics, and can be explained by science that is accepted by the scientific community. Naturalism does not only encapsulate atheism, it also includes agnosticism. There may be nuances between different approaches to the philosophy of Naturalism, but the primordial rules

are congruent: all supernaturals (including God) are either not real or cannot be known. Nonetheless, another argument of sophistry can be made, arguing that the paradox of the brain aforementioned remains unsolved. As a rejoinder, the evolution of the brain is an undisputed theory backed by evidence from anthropology and archeology, and the evolution of the brain and our body is a part of nature’s operations through space and time. Thus, as defined by the laws of Naturalism that the counterargument builds on, the questioning of the brain is out of the question.

Apart from religious faith, another layer of definition of Faith is the day-to-day faith. As defined by Merriam-Webster, “something that is believed especially with strong conviction.” What molds these quotidian convictions? Under the influence of previous events and empirical experience, quotidian faith is formed. For illustration, consider a favorite coffee shop. From the experiences of visiting the coffee shop every day, confidence is built: the coffee shop will open at eight in the morning, despite not explicitly writing its opening hours on the door. The piece of evidence that the faith revolves around is the key difference between religious faith and secular faith. Secular faith is a strong conviction due to evidence and experience seen and felt. This secular faith provides a sense of reassurance for future actions, such as stopping at the coffee shop the next day at eight expecting it to be open. Nevertheless, is seeing the coffee shop open at eight for one day enough evidence to herald that the coffee shop will be open at eight the next? For some, seeing the coffee shop open at eight once would be incomplete evidence, but for others, it is more than enough evidence for them to come back the next day at eight assured that the shop is open. Essentially, the amount of evidence that is needed is different, and there is no “insufficient” evidence; there is simply the presence of evidence and the absence of evidence.

Intrinsically, secular faith is a prediction of the expected, what we recognize as “should happen.”

From the perspective of neuroscience, faith is simply a way for the brain to reduce energy usage by taking a shortcut in the thought process. From this, the brain jumps to a familiar conclusion that is in the brain's memory, rather than an unfamiliar one that was not experienced [9]. Take the aforementioned coffee shop as an example: when extrapolating when will the opening hours of the coffee shop be for tomorrow, the brain generally jumps to the conclusion of eight in the morning, a familiar outcome that was experienced, but not at midnight, a situation that was not experienced. Our faith comes from our memories that serve as evidence.

III. Conclusion

In sum, the best answer to the question is simply both. Just as there is no single piece of evidence that could satisfy and validate every believer's faith, there is also no "incomplete" evidence for faith; there is only existent and non-existent evidence for faith. Although there may be a multitude of definitions for faith, offering "previous belief on incomplete evidence" as one of the definitions is inaccurate from both a theological and secular approach. The faith is in the believer's eyes, not in the theologians, the theists, or the atheists'.

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Section 6. Sociology

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PREDICTIVE MODEL FOR STUDENTS' MATH PERFORMANCE

Abstract

Aim. This study aimed to build a predictive model for the final grade of math students.

Method. A public data was used in this study. All the records were randomly assigned into 2 groups: training sample (50%) and testing sample (50%). A linear regression model was built to predict the final grade of math students using the training sample and then was applied in the testing sample for performance assessment.

Results. The random sample size is 325 in the testing sample and 324 in training sample, a total of 649 records. The average score was 11.91 for the full sample, 11.76 in the training sample, and 12.05 in the testing sample. According to the linear regression, father education, study time, previous failures, school sup, paid tuition, higher, internet, daytime alcohol assumption can predict the final grade among math students. Multiple R-squared was 0.3154 and the adjusted R-squared was 0.258. The average mean squared error for the linear model in the testing sample was 8.5. The correlation between the predicted and the observed was 0.494. The min-max accuracy was 0.8355. Mean absolute percentage deviation is 0.99.

Conclusions. In this study, we identified important of predictors for the final grade of math students, for example father's education, daytime alcohol assumption.

Keywords: Math performance, model, predictors, linear regression.

1. Introduction

The ability to predict one's academic performance is a great asset for both the students and the institution administrators. For the students, they can adjust workload, career direction, etc. If they are aware of their capability. For the administrators and instructors, early warnings would facilitate intervention thus enabling a more successful academic environment. In addition, institutional resources can be utilized in an optimal way thus gaining operation efficiency [1].

This study aimed to build a predictive model for the days for the final grade among math students.

2. Data and Methods:

Data

This dataset is public available for research.

All the records were randomly assigned into 2 groups: training sample (50%) and testing sample (50%).

R-squared is a statistical measure of how close the data are to the fitted regression line. It is also known as the coefficient of determination, or the coefficient of multiple determination for multiple regression.

The definition of R-squared is fairly straight-forward; it is the percentage of the response variable variation that is explained by a linear model. Or:

$$R\text{-squared} = \text{Explained variation} / \text{Total variation}$$

R-squared is always between 0 and 100%: 0% indicates that the model explains none of the variability of the response data around its mean. 100% indicates that the model explains all the variability of the response data around its mean.

Mean squared errors (MSE) were calculated and compared between both models. Min-Max Accuracy is defined as $\text{mean}(\min(\text{actual}, \text{predicted}) / \max(\text{actual}, \text{predicted}))$. The mean absolute percentage error (MAPE), also known as mean absolute percentage deviation (MAPD), is a measure of prediction accuracy of a forecasting method in statistics, for

example in trend estimation, also used as a loss function for regression problems in machine learning.

3 Results:

The random sample size is 325 in the testing sample and 324 in training sample, a total of 649 records. The average score was 11.91 for the full sample, 11.76 in the training sample, and 12.05 in the testing sample.

Table 1.

	min	Q1	Median	Mean	Q3	Max
Full sample	0	10	12	11.91	14	19
Training sample	0	10	11	11.76	14	18
Testing sample	0	10	12	12.05	14	19

final scores of students at the end of a math programs

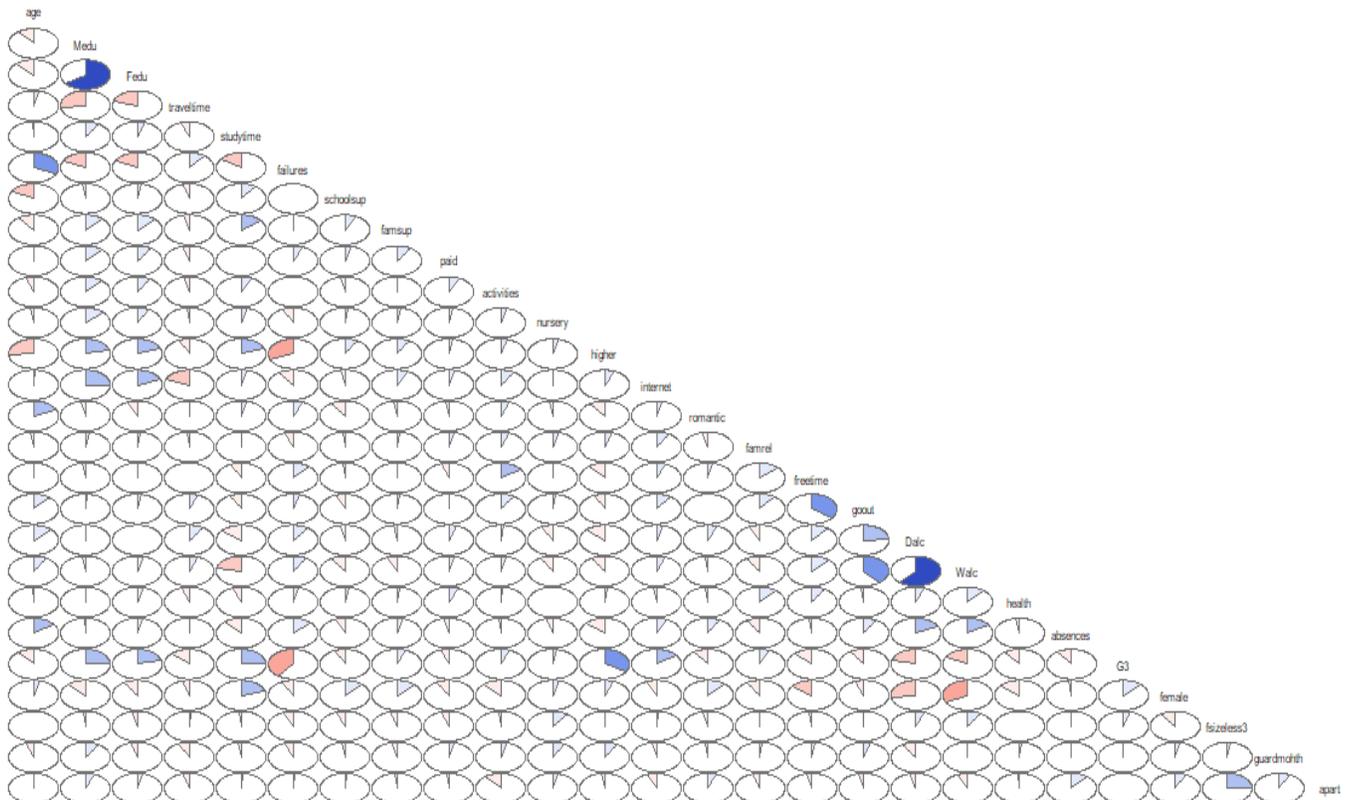


Figure 1. Pearson correlation coefficient across all the variables

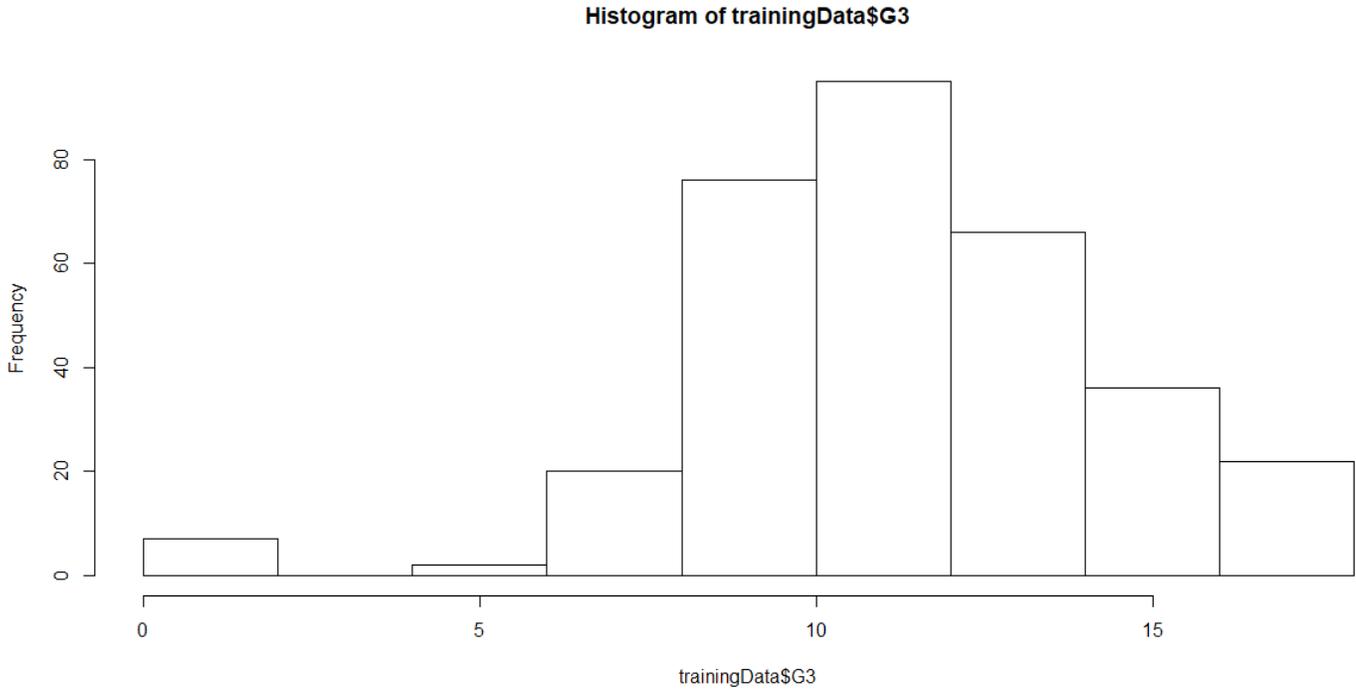


Figure 2. Distribution of Final Grade among Math Students in Training Sample

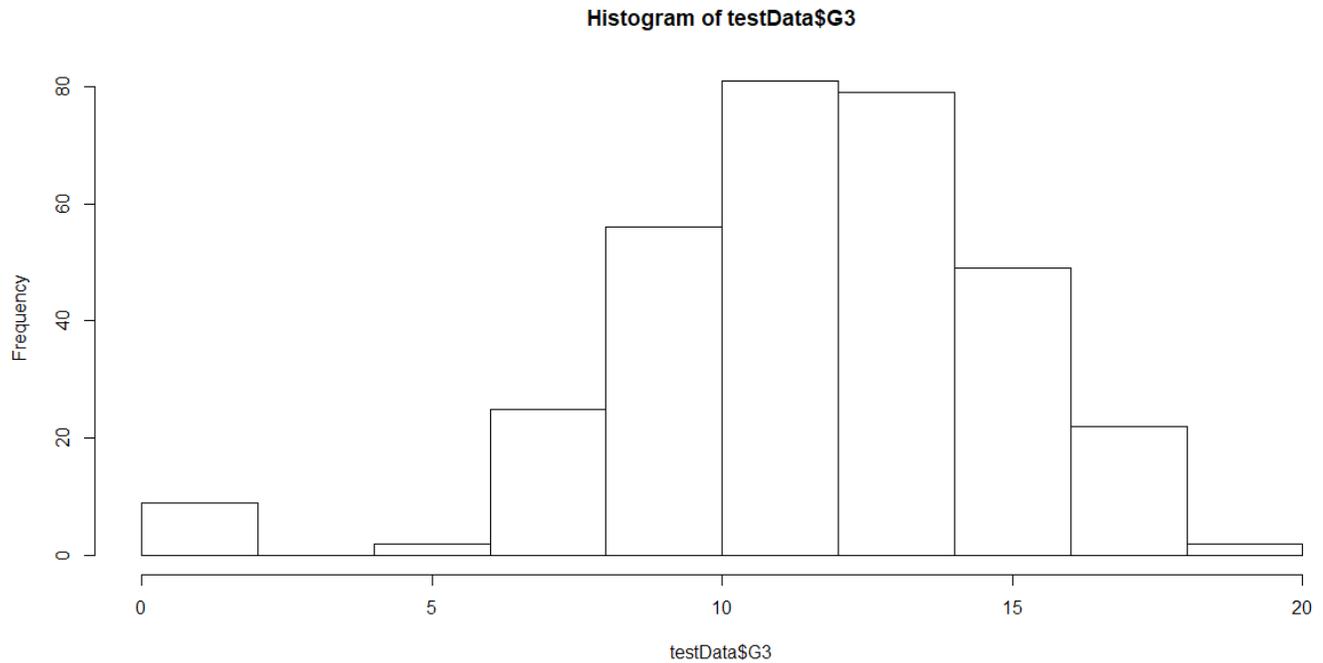


Figure 3. Distribution of Final Grade among Math Students in Test Sample

According to the linear regression, father education, study time, previous failures, school sup, paid

tuition, higher, internet, daytime alcohol assumption can predict the final grade among math students.

Table 2. – Linear Regression to Predict Final Grade among Math Students

	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	10.97	2.65	4.15	0.00	***
age	0.01	0.14	0.08	0.93	
Medu	0.02	0.20	0.09	0.93	
Fedu	0.40	0.19	2.09	0.04	*
traveltime	0.14	0.22	0.63	0.53	
studytime	0.45	0.19	2.36	0.02	*
failures	-1.19	0.28	-4.28	0.00	***
schoolsup	-1.09	0.53	-2.07	0.04	*
famsup	-0.38	0.32	-1.19	0.23	
paid	-1.49	0.59	-2.51	0.01	*
activities	0.19	0.32	0.59	0.56	
nursery	-0.22	0.40	-0.55	0.58	
higher	1.59	0.55	2.89	0.00	**
internet	0.94	0.37	2.52	0.01	*
romantic	-0.41	0.32	-1.29	0.20	
famrel	0.01	0.17	0.08	0.93	
freetime	-0.23	0.16	-1.43	0.15	
goout	-0.11	0.15	-0.70	0.48	
Dalc	-0.59	0.22	-2.71	0.01	**
Walc	-0.02	0.17	-0.09	0.93	
health	-0.20	0.11	-1.78	0.08	
absences	-0.01	0.04	-0.14	0.89	
female	0.19	0.36	0.53	0.60	
fsizeless3	0.38	0.36	1.05	0.30	
guardmohth	-0.06	0.35	-0.18	0.86	
apart	-0.49	0.48	-1.02	0.31	

Multiple R-squared was 0.3154 and the adjusted R-squared was 0.258. The average mean squared error for the linear model in the testing sample was 8.5. The correlation between the predicted and the observed was 0.494. The min-max accuracy was 0.8355. Mean absolute percentage deviation is 0.99.

4. Discussion

In another study, in the multiple regression model 5 factors explained 24.6% of the variance: socio economic status (9.3% of the variance), parental involvement with the school (6.4%), academic goals (4.9%),

student–teacher interaction (leadership, rigor and orientation towards mastery in triennial courses) (2.6%), and academic related skills (1.1%) [2].

The random sample size is 325 in the testing sample and 324 in training sample, a total of 649 records. The average score was 11.91 for the full sample, 11.76 in the training sample, and 12.05 in the testing sample.

According to the linear regression, father education, study time, previous failures, school sup, paid tuition, higher, internet, daytime alcohol assumption can predict the final grade among math students.

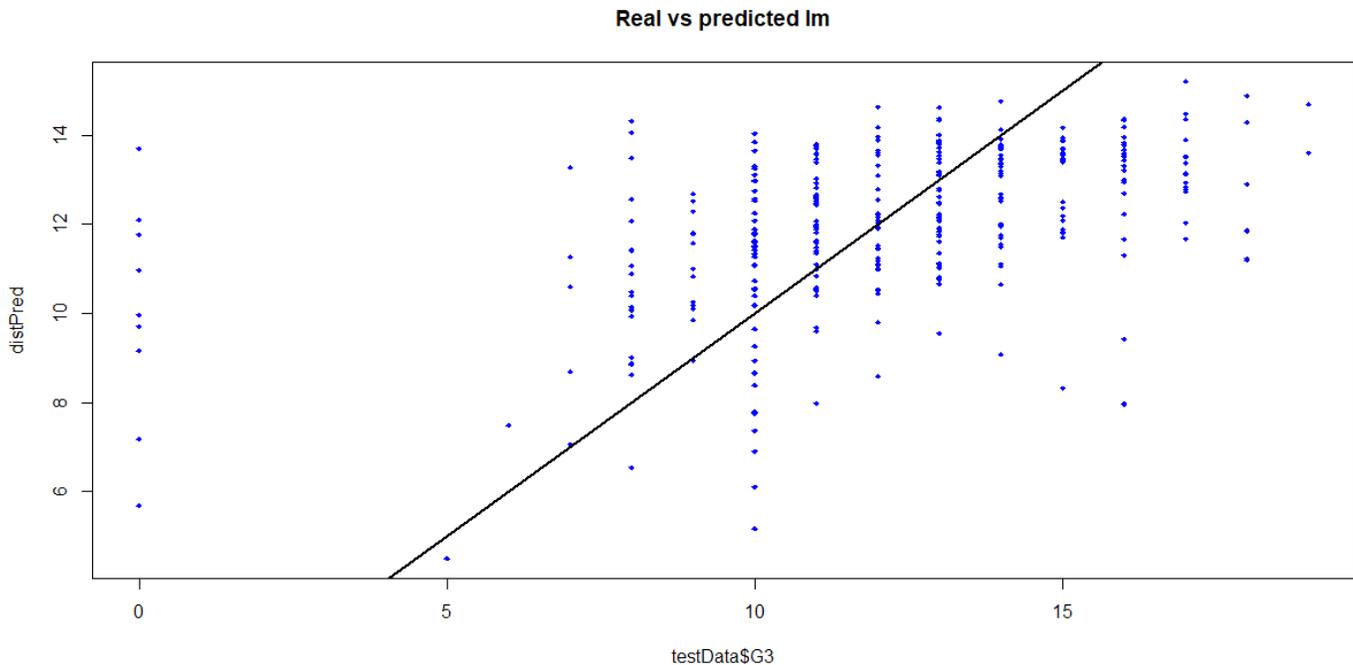


Figure 4: Predicted versus Observed Final Grade

Multiple R-squared was 0.3154 and the adjusted R-squared was 0.258. The average mean squared error for the linear model in the testing sample was 8.5. The correlation between the predicted and the observed was 0.494. The min-max

accuracy was 0.8355. Mean absolute percentage deviation is 0.99.

In this study, we identified important of predictors for the final grade of math students, for example father's education, daytime alcohol assumption.

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REVERSE DISCRIMINATION IS THE OUTCOME OF OPPRESSION AND EXPLOITATION ON THE BASIS OF SOCIAL CLASS, AND IT IS CAUSED BY THESE FACTORS

Abstract. The phenomenon of racial prejudice is difficult to eradicate since it is impacted by a wide range of variables, including race. Policies designed to eliminate racial discrimination might create another kind of reverse discrimination when they are adopted in significant quantities. The universe is not designed to be black and white, and individuals are not inherently good or bad in the traditional sense of the term. South African black people have no right to rectify racial prejudice against white people in the same manner that white people have no right to do the same thing. Racial prejudice is an unacceptable kind of conduct, and white people or black people should not treat others in this manner, regardless of their race or ethnicity.

Keywords: racial discrimination, racial prejudice, reverse discrimination, oppression, exploitation.

According to the United Nations, South Africa exceeds any other country on the earth in terms of the frequency of racist and repressive actions and behaviors, including racial profiling. All the comment is based on estimates from the country's human rights commission data. According to the World Population Prospects, one of these countries is the United States, with more than 320 million people and is the world's second-most populous country after China. The government's racial discrimination policy and the recently revived struggle of South African blacks against the government's discriminatory tax policy, are both products of a long history of conflict in both South Africa and the United States, particularly in the United States. The government's racial discrimination policy, as well as the recently revived struggle of South African blacks against the government's discriminatory tax policy, are both products of a long history of struggle in both South Africa and the United States. Slavery and thievery played essential parts in the creation of South Africa's history [41]. As a result, the present-day British and

Afrikaner monopoly carbon group that we see today from this progression. Also, slavery and theft played a significant role among the people of this nation at various times throughout history.¹ Consequently, fascist resistance groups have risen to the position of de facto leaders in the fight against US imperialism, which has grown into the world's most lethal opponent. Fascist resistance organizations have ascended to the position of de facto leaders in the struggle against US imperialism in Europe because of their founding in the 1960s and continued existence till the present day. The country's horrible history of slavery and thievery teaches us that excessive oppression and exploitation are the most significant source of racial discrimination and oppression. This situation eventually culminates in the creation of reverse discrimination and exploitation.

The Rise of Capitalism and the Development of Racial Problems

Between 1492–1598, Europeans who came to South Africa were the first to establish permanent colonies. The arrival of the Portuguese in 1492 and

the coming of the Dutch in 1598. As far back as 1652, historical records reveal that the Dutch East India Company established a “supplementary station” in Cape Town, South Africa, to further its development objectives [7]. This was more than 300 years ago, according to historical records. Dutch colonists ruled much of South Africa throughout the 18th century, extending their influence from the southern tip of the Cape of Good Hope to the northernmost reaches of the Great Jakes Mountains in the north. The Dutch began annihilating the indigenous inhabitants as soon as they arrived to gain control of the territory. Following their conquest of the fertile region, the Dutch settlers coerced, slaughtered, and beat the Africans into slavery, a practice that is still carried out today in certain parts of the world [32]. There is a deliberate strategy to administer farms and ranches based on enslaved African Americans, and this plan is being implemented. Because of the emergence of European humanism, Germany, Sweden, and England suffered financial ruin, and Huguenots who fled their country after losing the theological battle found themselves in South Africa during the 17th and 18th centuries, where the country became a magnet for those who sought refuge there. European immigrants arrived in large numbers from the middle of the 18th century forward. This time was when the name “Boer” was first used to refer to a group of people from the Netherlands from the middle of the 18th century forward, European immigrants arrived in large numbers. It was at this time that the name “Boer” was first used to refer to a group of people from the Netherlands [3]. In their language, they spoke an Afrikaans dialect that was unique from either the Dutch or the French, and they did not consider themselves speakers of either language. Following their conquest of their own country, these groups of Boers, who were the forebears of today’s Afrikaners, invaded and settled on farms and ranches in the surrounding region after establishing themselves in their homeland of the Netherlands.

Historians believe that the looting of South Africa by western colonial powers increased in severity towards the end of the nineteenth century, in part because it occurred at a time when the world was transitioning from capitalism to imperialism. As capitalist capitalism gave way to imperialism, historians believe that the looting of South Africa by western colonial powers increased in severity towards the end of the nineteenth century. Consequently, the significance of colonies expanded throughout the same period, and the general public became more aware of their presence because of this development [33]. Consequently, the importance of colonies increased over the same time. The economy of the United Kingdom was in freefall because of the usage of outdated industrial equipment and the impact of a fast-rising population. The United States has been motivated by the most robust expansionist goal in history to do this, and it has depended on its colonies to provide a lifeline for its economic well-being throughout periods of global financial instability.

Many imperialist governments, particularly those in Western countries such as the United States, were interested in learning more about the South African gold rush. This rush took place over several decades in the 1980s and 1990s and continued for a total of several decades in the 1980s and 1990s and was particularly interested in learning more about the gold rush in the United States. There was a strong desire to learn more about the reasons and repercussions of the California gold rush, which started in 1848 and lasted for many months [22]. This event, which took place in South Africa’s orange river and marked the beginning of the world’s first diamond frenzy, which would run until the early twentieth century, was marked by the finding of the world’s first diamond, which was discovered on the Orange River in 1867. Following the discovery of the world’s first diamond, a period of frenzy ensued that lasted for many decades.

A limitless number of similar trends followed in its wake, and this was just the beginning of a con-

tinuous line of similar trends that would follow in its wake after them. A seemingly endless number of comparable trends Even though there is a seemingly endless number of comparable trends, there was a strong feeling of potential encompassing the surrounding area, even though it was cold outside [37]. Commercial activity has been halted, military troops have been evacuated from their positions, merchants have shuttered their shops, the equipment has been rendered unusable, and livestock has been removed from the fields by locals. Thousands of cattle and ranchers were greeted by an overwhelming swarm of animals after making their way down the Orange and Hur rivers in a frantic attempt to get away from impending floodwaters [29]. The animals stampeded away from the floodwaters and were met by an overwhelming swarm of cattle and ranchers. When huge gold reserves were discovered in South Africa's Transvaal region during a ten-year search for fresh gold discoveries, the Transvaal Goldfields Corporation was established to exploit the discoveries. Despite this, the firm has continued to function to this day. As recorded in historical documents, a gold mine was discovered near the town of Baishuryeong in South Korea in 1886, making it the world's oldest gold find up to that point in time. Baishuryeong has become a well-known tourist attraction throughout the past many years. The discovery of the mine resulted in it rapidly being the world's biggest gold mine, and it continues to be the world's largest gold mine to this day [35].

Racism and bigotry resulted in white monopolists from Anglo-American and South African origins gaining control of the lucrative white-collar jobs that followed. The seven most major gold mining businesses in South Africa, according to one estimate, purchased 99 million British tadpoles in 1958. Another estimate asserts that a British and American corporation, which owns 7.75 million British tadpoles, got 840.000 British tadpoles in a single year in 1958 as part of a joint venture [38]. Racial injustice has been perpetrated against the people of the

Republic of South Africa. Even in public policy, the national struggle is a minimalist conflict at its most fundamental level of complexity. Only a small group of white reactionaries were responsible for the subjugation of black people in the United States. The Republic of South Africa has replaced the Union of South Africa as the country's official name. Although it seems to be a pro forma ultra-democratic state, it is a fascist police state enforcing some of the most heinous practices of racial oppression and discrimination in the world. According to Human Rights Watch, the Republic of South Africa is the world's most brutal police state. With the support of financial backers in the United States and the United Kingdom, the anti-political white group in South Africa hopes to maintain and expand the country's system of racial discrimination to extract cheap labor from Africans and intensify the plunder and exploitation of those laboring under unfair conditions [1].

In the Opposite Direction, there is discrimination

White racism is the view that white people are superior to everyone else. People who believe in white racism make choices regarding other races based on apparently trivial qualities such as skin color or skull shape, as well as connected actions. The "apartheid" deception, which the South African harassment syndicate had perpetuated in prior years, was exposed earlier this year. Following the findings, for example, the South African harassment syndicate resigned from its post. According to the idea, rationalist racism in South Africa thinks that "whites" and "blacks" should grow separately of one another rather than in touch with one another during political conversations because to the country's diametrically opposed speech, propaganda, and culture. Although his region is relatively tiny in comparison to the rest of the country, Yukgeng's territory, which amounts for less than a fourth of South Africa's total geographical area, has more than 10 million black people [36]. According to the 2010 census, white people account for around 87.4 percent of the country's industrial

ethnic-based racial segregation system has only been advantageous to white South Africans throughout its existence. This case has been consistent throughout history. Imperialism maintains its grip on the nation and continues to exercise influence and control even though the United Kingdom no longer has a significant degree of power or result in the country [42].

South Africa was transformed into the site of one of the world's most severe racial oppression and discrimination regimes as a result of centuries of colonial rule, with the entire African population being forced to live as domestic animals in a horrendous environment for the rest of their lives as a form of penance [23]. By the glazed-lit sign at the church's front door, all of the measures taken by South Africa's reactionary colonial rulers are only for the advantage of White people. The church, which is in the heart of Cape Town, is a sight to see. This claim remains true of the atrocities committed by colonial authorities throughout their reign of terror in Africa during the duration of their reign of terror. In addition to being available at the theater's ticket office and on the trolley bus that circulates across the city, it is now available for purchase online [2].

Among other things, it was illegal for South Africans to leave the security of a European palace, leave without the permission of their employer, and live in European cities, except for those who lived in the forbidden suburbs, where they were housed in huts that looked similar to dog kennels. Furthermore, South Africans were forbidden from traveling to and from Europe. Many individuals cannot rent or own real estate for their personal use or to profit from it in the marketplace, which may be ascribed to several factors, including financial restraints [11]. The city of Johannesburg had a total non-Bantu population of 207000 persons in 1946, despite the Bantu population being only 15000 individuals at the time of the 1946 census. According to official municipal figures, approximately 21.000 people live in public housing in Cape Town. According to official municipal statistics, around 10.000 Bantu people are accommodated

by the city's public housing system, with a further 21.000 individuals also staying in public housing, for a total of 21,000 people dwelling in public housing in the city, as reported by the town [20]. The author defines it as "little more than a cluster of kennels, with confinement's most identifying quality as its most obvious feature". Finally, she writes under the pen name "not more than that" [17].

More than a quarter-century after the start of the struggle against white supremacists in South Africa, the general public's image of African intellectual ability has steadily improved. According to the study's findings, the failed workers seem to be becoming more and more effective at their professions with each day that passes. Because they live under the threat of a violent colonial flag flying over their land, they have taught their children that pacifism is not an option when confronted with a violent colonial banner [9]. It is their obligation to oppose colonial brutality since they are under the rule of such a powerful colonial force.

The fact that South Africa is under the rule of a harsh colonial power does not change the this is the case. Still, during the decades leading up to independence, there was a widespread belief that freedom could only be achieved through a violent revolution against tyrannical colonial rule. The independence movement was in full swing during the time period in which this concept gained significant acceptance in the general public's consciousness [24]. For a brand-new squad known as the spear of the nation, which was founded earlier this month and whose primary technique of combat strategy is physical force, fighting is the primary method of combat strategy. According to a pamphlet published on 2 April by the South African Africans, the African Resistance Movement will serve as a new emblem of racial rule in South Africa. In line with this booklet, the African Resistance Cause will be used to recruit new members to the organization, which is a promising sign for the group's future growth and development [12].

No matter what type of hostility we are presented with when it becomes necessary to resort to violence as a reaction, we shall conduct ourselves in the way outlined above, regardless of the circumstances in which we find ourselves. Given the current state of affairs, it seems that the legitimate battle of the South African people resulted in a successful conclusion [21]. As it advances throughout Asia, Africa, and Latin America, among other countries, the struggle for national liberation is sweeping away the imperial ruins of colonialism and building a new global order. For their part, revisionists of the current age hold in high esteem the concepts that bind Asia, the Middle East, and Europe together because of their shared historical experience.

Although they are movements of white supremacy in their natural state, Africans and Latin Americans are fighting for their rights against the white race across Africa and Latin America, and this is not acknowledged as such. As a result, under the Terrorist Organizations Act of 2001, the United States government-designated national liberation movements as terrorist organizations, claiming their ultimate goal of battling imperialism on behalf of all peoples throughout history as the justification for the category [39]. Others argue that our organization is just concerned with preserving the essential spirit of national liberation movements in all their manifestations, regardless of their political allegiances, unrelated to the above. This case was not factual. It is necessary to “erect boundaries between races and geographies”, to “substitute racial conceptions with hierarchical notions”, to “replace racial concepts with hierarchical perspectives”, and to “erect boundaries between races and geographies”. It is also necessary to “substitute racial conceptions with hierarchical notions” and to erect boundaries between races and geographies [26].

Another vital step is replacing racial concepts with hierarchical ones, as well as establishing borders between d races and geographies [13]. Another crucial stage is the replacement of racial concep-

tions with hierarchical concepts, and the “delineation of boundaries between various races and geographies”. One of the most important stages is the replacement of racial ideas with hierarchical notions, as well as the “delineation of borders between distinct races and geographical areas”. One of the most essential phases is the replacement of racial conceptions with hierarchical notions, as well as the “delineation of boundaries between separate races and geographical places”, which are two of the most significant stages. Replacement of racial concepts with hierarchical ideas, as well as the “delineation of borders between various races and geographical areas”, which are two of the most crucial stages, are among the most important phases to go through [10]. Both the “delineation of borders between various races and geographical areas”, which are considered to be two of the most key phases, and the “replacement of racial concepts with hierarchical notions” are considered to be two of the most critical stages to undergo [28]. In addition to the many reasons for taxes in the first place are just a few instances of the numerous factors that impact taxation: taxation is influenced by: There are a variety of other alternatives accessible as well.

As a result of the publication of a paper titled “The Soviet Institute for African Studies and the African Question”, written by Yi Potishin, the director of the Soviet Institute for African Studies and published by the Soviet Institute for African Studies, several commonly held beliefs have been called into question and even challenged [18]. Several well-established beliefs have been questioned due to the publishing of this book. However, even though both events are universally considered significant moments in African history, many people continue to make the error of concluding that pan-Africanism and the battle between two ideologies are mutually exclusive. During this time, the national liberation struggle was experiencing difficulties because actions taken by the Soviet Union’s current revisionist leadership at the time of the occurrences should not be overlooked.

Following the Xin flow of harm's defiance of Soviet authorities during the national liberation struggle, the revisionist regime in power was able to exert a significant amount of control over them, which was particularly true in the specific situation of the Xin flow of harm, as previously stated. The Xin flood caused widespread destruction, which is evident today. They declare in a proclamation that ending the Chinese people's battle for national independence and sovereignty is equivalent to putting an end to all human rights violations across the globe [27]. They want to get the imperialist "mercy kick", which they believe will accelerate them closer to their ultimate aim and push them toward their final destination, which is the United States [14]. In two white communities, one for the white "working aristocracy" and another for the white "colonialists", they pray for "joy" and look forward to getting the imperialist "mercy kick". The word delight is defined as "pleasure for the senses", according to the Oxford English Dictionary [16]. In light of the long history of collaboration and alliance between imperialists and colonial governments throughout history, contemporary revisionists have an opportunity to fill the

void left by imperialists' unwillingness to collaborate with colonial governments throughout the world's history and to do so in a way that is consistent with the historical record [19].

Also noteworthy is that it is a task that the imperialists could not complete during their reign, making it all the more critical in that respect. The only way for us to be successful in our battle against imperialism and neocolonialism is to retain our dedication to combating them while also being diligent in our resistance to contemporary revisionist views of the world and its history. For the time being, we will assume that they have maintained their unity and are proceeding in the proper direction in terms of military strategy and operations [6]. It is partly because of Africans and people worldwide, including those in the United States of America. They oppose imperialism and colonialism. In general, the South Africans achieve their long-awaited independence, freedom from imperialism, and liberation from old and new colonialism. This reason provided optimism about their ability to achieve their long-awaited autonomy, freedom from imperialism, and independence from old and new colonialism.

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Section 7. Economics and management

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THE EFFECTIVENESS OF TAXPAYER BURDEN REDUCTION POLICIES USED BY SHANGHAI GOVERNMENT TO HELP REDUCE UNEMPLOYMENT

Abstract. With the epidemic, the economic situation in Shanghai was not good. At the same time, the Shanghai government adopted several programs to try to recover the economy, and because of my family's business, I was attracted by one of the policies directly related to my family's business: "reducing the tax burden for small and medium-sized enterprises". The detailed description of this policy led me to think about the unemployment rate in Shanghai and I intend to study it in more depth. I will use the following two methods to investigate:

Secondary research: By collecting data on Shanghai's real GDP before and after the implementation of the tax reduction policy on the authoritative statistical website, and analyzing the law of its changes, it is finally judged whether such a policy is effective.

Economic evaluation: Once the two tasks of data collection and charting are completed, the effectiveness of Shanghai's tax reduction policy is determined through a more systematic identification, measurement and valuation of the inputs and outcomes of the policy, followed by a comparative Finally, these processes are used to determine whether Shanghai's tax reduction policy is effective.

Keywords:

Background:

The Shanghai government will provide subsidized support to the local finance for the expenditure on epidemic prevention and disinfection of eligible small and medium-sized enterprises from February 11, 2020, and reduce the tax in this area again on March 29, 2022. Full subsidized support for the cost of regular nucleic acid testing for key positions in the retail and restaurant industries in accordance with epidemic prevention requirements; and subsidized support for

expenditures on epidemic prevention and extermination for retail and restaurant enterprises. Full subsidized support is provided for the expenses of nucleic acid testing for personnel in airport ports and cold chain related businesses. Due to the epidemic, Shanghai's prices are soaring, the quality of life of the middle and low-income groups is significantly reduced, while small and medium-sized enterprises continue to experience negative phenomena such as closing down because they cannot start producing goods and pro-

viding services but need to pay their employees, the reduction of taxes will lower the costs of production of enterprises, which will lead to lower prices of the products they sell, which is more conducive to promoting consumption. Reducing the tax burden on the flow of manufacturing enterprises is conducive to increasing the profitability of enterprises and increasing their capital accumulation, so that they will have enough capital to innovate and expand, and the economy of Shanghai will recover as a result.

Literature Review:

The formulation of macro policies, the introduction of regulatory initiatives, and the implementation of reform measures should be timely and effective, especially to enhance the coordination and convergence of various policy measures with a systematic concept and comprehensive approach to form an overall synergy.

Judging from the operation of the macro economy in the first quarter, the triple pressures of insufficient domestic demand on the demand side, intensified shocks on the supply side, and weakening expectations for economic growth continued and tended to increase. New situations and changes need to be paid attention to, and the task of achieving the economic goals set forth in the government work report is even more challenging. And there are big differences between different industries in the job market, and the structural mismatch phenomenon is still serious. According to the report “2022 Spring

Employment Market Trend Observation” by boss Direct Recruitment Research Institute, the recruitment scale of high-end manufacturing industry has increased by more than 40% year-on-year, far exceeding finance (37.4%), e-commerce (29.8%), Internet (12.8%) and other industries, but there is a general shortage of engineering and technology talents, and the talent gap in most segments is greater than 20%. The rapid expansion of the Internet industry slowed down due to policy regulation in 2021 and the layoffs of major Internet companies. In the spring of 2022, the recruitment scale of the Internet industry grew at a year-on-year rate of 12.9%, still maintaining the growth trend, but the increase was at a low point since 2019. Also under the influence of policy regulation, in the spring of 2022, the education and training and real estate industries contracted the recruitment scale, of which the entire education and training industry job scale contracted by more than 30%, the decline in the ability to absorb jobs in the education and training industry directly led to a shortage of market job supply, intensifying the intensity of competition for people seeking jobs in related industries. The report shows that the real estate and education and training industry practitioners in the process of changing careers are the preferred industry for the Internet, which further intensified the degree of competition in the Internet industry.

Data findings and analysis:

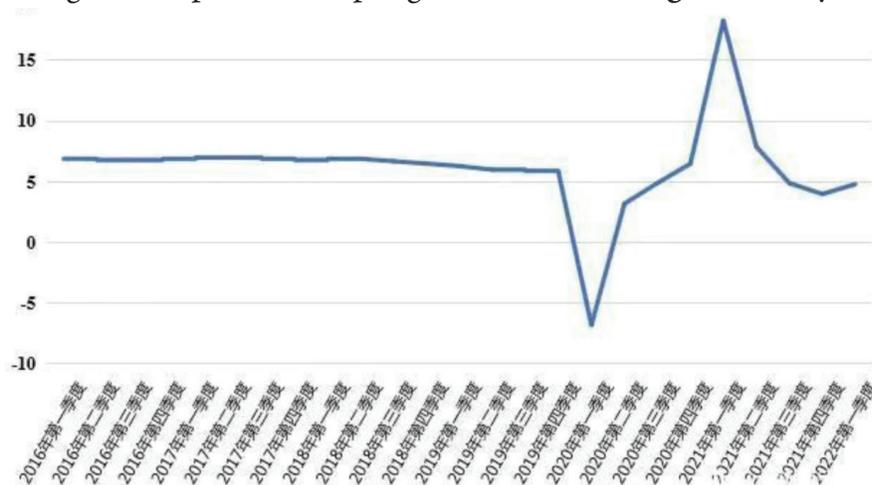


Figure 1.

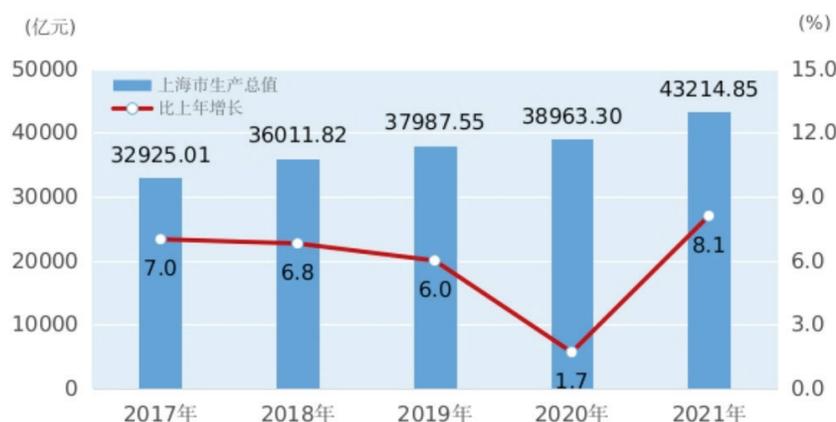


Figure 2.

表 2 2021 年地方一般公共预算收支及其增长速度

指 标	绝对值 (亿元)	比上年增长 (%)
地方一般公共预算收入	7771.80	10.3
#增值税	2485.91	8.8
个人所得税	860.78	28.4
企业所得税	1694.40	21.5
契税	410.45	8.0
地方一般公共预算支出	8430.86	4.1
#一般公共预算支出	382.42	3.1
公共安全支出	453.72	2.9
教育支出	1039.46	3.9
科学技术支出	422.70	4.1
社会保障和就业支出	1023.97	4.4
卫生与健康支出	633.13	16.3
节能环保支出	159.30	-12.4
城乡社区支出	1431.04	0.8

Through the analysis of the data, I finally came to the following conclusions.

First, to stimulate the enthusiasm of all kinds of micro market players, to promote the release of consumer demand and investment demand to enhance. The key to the release of consumer demand lies in the sustainability of income growth, and it is recommended to launch a plan to multiply middle-income groups, which will be carried out and promoted from two dimensions:

income multiplication and quantity multiplication. decisive role. The controllable variables that will have a greater impact on economic growth in 2022 are still fixed asset investment, especially the stable role of infrastructure investment and manufacturing investment is crucial. China's traditional infrastructure and new infrastructure have a broad space for investment growth, and the imbalance in the distribution of infrastructure such as transportation, energy and water conservancy

between the East, Central and West, and between urban and rural areas is still relatively prominent.

Second, accelerate the supply chain and industrial chain to make up for shortcomings, tackle core technologies, and enhance the production security capacity of domestic resources in key areas. China's economy is facing different types of supply shocks, the most critical being the core technology bottleneck. At present, the fourth technological revolution is emerging, a new generation of information technology and manufacturing is showing a trend of deep integration, advanced sensing technology, digital design and manufacturing, robotics, intelligent control systems and other applications in the manufacturing industry are becoming more and more widespread, digital transformation, networked collaboration and intelligent change makes the traditional manufacturing form and ecology is undergoing profound changes. For 2025, we should strive to achieve the digitalization and networking of most manufacturing enterprises above the scale, the initial realization of intelligence in key industry backbone enterprises, promote the proportion of digital economy in China's economy to achieve a significant increase, and realize the transformation from factor-driven to efficiency-driven and innovation-driven. Based on this, the digital transformation of the relevant traditional industries can moderately accelerate the progress, in order to form more new growth poles and growth points, to inject new momentum for stable growth.

Third, deepen market-oriented reform and system-based opening. It is not enough to rely on loose policies alone to stabilize growth, we must ask for dividends from reform and opening up. The historical experience, practical exploration and theoretical logic since the reform and opening up have shown that reform is a powerful driving force for economic growth. As the reform enters deep water, it is not enough to rely solely on internal forces, and we should promote a new round of reform and development with the power of opening up to the outside world.

It should take the initiative to participate in bilateral and multilateral negotiations with a positive and open attitude, compare the highest level of free trade agreements and investment protection agreements, give market players greater economic freedom of choice, and create a rule of law and market-oriented environment for fair competition.

Unemployment rate rose in the first quarter, the labor market is under pressure. The report points out that the unemployment rate rose in the first quarter of 2022, close to the control target expected for the whole year, the dynamic adjustment between enterprises and industries in the labor market, the intensification of structural contradictions, the obvious shrinkage of population mobility due to the high popularity of Omicron, the decline in the growth rate of residents' income, the narrowing of the urban-rural gap and the labor market under pressure.

As for the unemployment rate, the data showed that the national urban survey unemployment rate from January to March was 5.3%, 5.5% and 5.5% respectively, with a continuous rise in the chain and -0.1%, 0 and 0.2% year-on-year, basically flat and close to the control target of 5.5% expected for the whole year. Among them, the urban survey unemployment rate in 31 large and medium-sized cities from January to March was 5.4%, 5.4%, 5.8%, up 0, -0.1%, 0.5% year-on-year. The unemployment rate is under continued upward pressure due to the epidemic, and the year-on-year increase rate has continued to climb since June last year. The number of new jobs added to March accumulated 2.85 million, down 4.04% year-on-year. In February and March, the average weekly working hours of employed workers in enterprises nationwide were 46.7 and 47.3 hours, lower than the previous quarter, but up compared to the same period last year, up 0.4 and 0.4 hours respectively.

In addition, data from the National Bureau of Statistics showed that the national per capita disposable income in the first quarter was 10,345 yuan, a real year-on-year increase of 5.1%. Urban per capita disposable income was 13,832 yuan, up 4.2% in real

year-on-year terms, of which 8,395 yuan was wage income and 1,495 yuan was net property income. Rural per capita disposable income was 5778 yuan, up 6.3% year-on-year, of which 2566 yuan was wage income and 365 yuan was net property income. Rural income rose faster than urban income as a whole, and the income ratio between urban and rural residents was 2.39, down 4.4% year-on-year, narrowing the income gap between urban and rural areas.

The average monthly income of rural migrant laborers in the first quarter was RMB4,436, basically the same as the previous quarter; the average monthly income growth rate was 5.9% year-on-year, down from the previous quarter.

At the same time, population movement shrank significantly, with large differences between different sectors of the job market. The report noted that population movement shrank significantly due to the high prevalence of Omicron. Under normalized epidemic prevention and control, population movement improved in January and February compared to the previous two years and gradually approached pre-epidemic levels. Rail passenger traffic steadily recovered, but road traffic was still blocked. Since the spread of the more contagious evolutionary branch of Omicron in March in the homeland, the scale of population movement across the country has shrunk sharply, continuing to fall to its lowest point in the last three years.

In addition, the structural contradictions are intensifying as the labor market dynamics adjust between firms and industries. The report analysis points out that the development of recruitment demand differs between enterprises of different sizes in the job market, with large enterprises being less affected by the impact of the epidemic and the economic downturn and under strong pressure, while SMEs are affected by the epidemic and more cautious in recruitment. Since February, the multi-point distribution of the epidemic across the country has restricted the cross-regional movement of people, and the activity of small and micro enterprises rely-

ing on offline operations has been affected, according to the Wisdom Associates Recruitment Institute's 2022 Spring Talent Flow New Features" report, compared with the same period last year, the hiring demand of small and medium-sized enterprises dropped in the first month after the 2022 holiday, with the number of hiring for enterprises with less than 20, 20–99, 100–499 and 500–999 employees decreasing by 7.8%, 3%, 4.7% and 11.6% year-on-year, respectively. Large enterprises have a strong ability to bear pressure, and recruitment demand remains strong, with the number of hires in enterprises with 1,000–9,999 employees increasing by 6.5% year-on-year and by 23.4% in enterprises with more than 10,000 employees.

Conclusion and commendation:

Regarding how to coordinate epidemic prevention and control and economic development, effectively resolve the triple pressure, and ensure that the economy operates within a reasonable range, the research team believes that economic construction is always the central task, and economic development is always the first priority. Under the circumstance of increasing risks and uncertainties at the international level and pressure on the growth of external demand, stabilizing China's macroeconomic market requires stable growth of domestic demand, which first requires the stabilization and preservation of market microeconomic entities. Only by consolidating the micro-foundation of macro-economy can we further stimulate the vitality of market entities and stabilize the macro-economic market. Under the current special situation of the epidemic, it is particularly important to provide service guarantees for enterprises and people's livelihood guarantees. It is necessary to firmly stabilize the industrial chain, supply chain, and capital chain, unblock the logistics and freight channels of enterprises, and make good use of platform enterprises to solve the problem. The role of going ahead steadily and surely and increase financial support for industries, enterprises and people affected by the epidemic.

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Contents

Section 1. Cultural studies.....	3
<i>By Xinlin Cao</i>	
NO GAME, NO GAIN: VIDEO GAMES ARE PORTALS TO EXPLORATION, CONNECTION, LEARNING, AND FREEDOM	3
Section 2. Literature	5
<i>Lingzhu (Melanie) Shao</i>	
DYSTOPIAN DOUBLETHINK, TONES, AND HISTORY IN GEORGE ORWELL'S 1984 AND PHILLIP K. DICK'S UBIK	5
Section 3. Medical science.....	12
<i>Yihai Wei</i>	
DEVELOPMENT OF A CLASSIFICATION MODEL FOR MENTAL HEALTH	12
<i>Joanna Yao</i>	
A COVID-19 DATA ANALYSIS IN A STATIONARY TIME SERIES.....	19
Section 4. Psychology.....	26
<i>Kexin Huang</i>	
SELF-PERCEIVED VS ACTUAL WEIGHT STATUS: WHICH IS A STRONGER PREDICTOR OF ADOLESCENTS' SUICIDE INTENT?	26
Section 5. Regional studies	34
<i>By Yutao Liu</i>	
IS FAITH ANYTHING OTHER THAN UNCERTAIN BELIEF ON INCOMPLETE EVIDENCE?	34
Section 6. Sociology	38
<i>Qianran Bi</i>	
PREDICTIVE MODEL FOR STUDENTS' MATH PERFORMANCE.....	38
<i>Ziyue Wu</i>	
REVERSE DISCRIMINATION IS THE OUTCOME OF OPPRESSION AND EXPLOITATION ON THE BASIS OF SOCIAL CLASS, AND IT IS CAUSED BY THESE FACTORS.....	43
Section 7. Economics and management	52
<i>Wenyu Yang</i>	
THE EFFECTIVENESS OF TAXPAYER BURDEN REDUCTION POLICIES USED BY SHANGHAI GOVERNMENT TO HELP REDUCE UNEMPLOYMENT	52