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Letter from the Editor.

Dear Readers,

The editorial board of the *Journal of Secondary Psychological Studies* is excited to present the second edition of the fifth volume of our publication. I am incredibly lucky to have worked with an extremely dedicated staff and passionate researchers to create this edition.

As the world is constantly faced with inequality and injustice, we are tasked with making strides towards equality. In this edition, we highlight research that grapples with a variety of pressing issues ranging from disordered eating to the effect of wealth disparities in dental care. The authors of these research papers have continuously strived to better their own work and the world by addressing these issues. We are honored to be able to showcase the young minds of today who are willing to tackle these societal problems.

Likewise, our staff has put in countless hours to collaborate with authors to ensure that their important research is skillfully highlighted. This edition became incredibly important as we implemented a new editing strategy with the goal of improving communication, optimizing our team's efficiency, and bettering our interactions with authors.

As we continuously see inequality and disparities in our society, it is up to students to explore these issues and work toward change. We hope this edition showcases the value and necessity for research and inspires other students to make discoveries and leave a lasting impact.

Elle Kaplan

Editor-in-Chief

The Role of Empathy and Parental Modeling in Food Addiction

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Abstract

The dietary choices and habits of parents have often been linked to the behaviors that their children develop. It is understood that one's relationship with food is influenced by a host of factors including family and emotions. Previous studies on the child-parent relationship have failed to acknowledge the magnitude of a child's perception of their parents/guardian's food addictiveness on the development of their own food addiction. This study examined this overlooked relationship and how empathy influences the said connection through a digital survey consisting of a modified 10-item Yale Food Addiction Scale and a modified 10-item Empathy Quotient. As empathy is the ability to sense the feelings and emotions of others, it may play a role in how a child perceives their parents. The findings indicate that there is a positive correlation between perceived parental food addiction and the individual's food addiction. Additionally, there is a positive correlation between empathy and the individual's food addiction score and a correlation approaching significance between empathy and perceived parental food addiction. While this notion was true for the whole population, those with a high level of empathy were more vulnerable to perceiving this. Understanding the role of parenting in food addictive behavior can revolutionize the habits of parents as this study revealed its detrimental effects.

Addiction is a prevalent issue in American families. In fact, roughly 25% of children in America reside in homes where substance and drug abuse occur (Editorial Staff, 2022). Due to the poor parenting accompanied with addiction, children of addicts are more likely to perform poorly in school, suffer from depression and anxiety, and become addicted to narcotics and alcohol. When a parent is abusing a substance, they switch roles with their children. These children now take on the responsibility of a caregiver.

Food addiction consists of pleasurable eating practices that involve the overconsumption of foods that contain excessive amounts of sugar, salt, and fat (Zhao et al., 2018). This psychological illness is frequently accompanied with deplorable cravings and a lack of self-control in relation to pleasure-inducing foods (Fletcher & Kenny, 2018). When junk food is consumed, the reward system stimulates the brain with a sense of pleasure in the same manner as addictive narcotics. Chemicals such as dopamine are released as feel-good chemicals, which the brain classifies as pleasure (Zhao et al., 2018). Feelings of pleasure often follow the consumption of diets that are high in refined foods and sugars. When comparing diets across the world, there are higher amounts of refined foods and sugars in "Western" diets (Selhub, 2020). Therefore, it is not surprising that food addiction is such a prevalent issue in America where approximately 70 million people suffer from this disorder (Candelaria, 2016). In addition to being linked with obesity in

general, food addiction and diets that are high in granulated sugar have been connected to cognitive impairments and have aggravated symptoms of mood disorders such as depression, loneliness, anxiety, and low self-esteem (Jacques et al., 2019; Selhub, 2020; Zhao et al., 2018).

Overeating is a common practice among empathetic individuals. To cope with the feelings of others, food is overconsumed by highly empathetic people to suppress feelings of stress (Orloff, 2017). However, this quality has yet to be explored in the body of knowledge regarding addiction to food. Similar to highly empathetic people, the way children view the actions of their parents influences their own habits and behaviors (Sherman & Smith, 2019). Since it is known that food addiction is a prevalent issue in the United States as well as that perception influences behavior, it is imperative to study how perception, whether based on parents or on empathy, affects the eating habits of children.

Review of Literature

Previous studies have shown that food addiction contributes to the severity of obesity and physique measurements from normal weight to severely overweight individuals. This occurs more in women than in men (Pedram et al., 2013). In general, women are more likely to suffer from eating disorders than men are (Striegel-Moore et al., 2009). Additionally, 80-89% of food-addicted individuals in a study

were considered overweight or obese based on their Body Mass Index (BMI) (Pedram et al., 2013). This shows a correlation between the eating disorder and obesity. An additional strong correlation was also found between victims of child abuse and food addiction. This was in part due to victims responding to stress by utilizing food (Mason et al., 2013). Coping with emotions through eating is not limited to abuse victims. Overeating is common among highly empathetic people who cope with the problems of others by consuming an excessive number of sugars, carbs, or unhealthy food (Orloff, 2017). In addition to the emotions of others, the actions of parents are also influential in shaping the behavior of children. Modeling is a crucial aspect of parenting. In fact, parenting is 80% modeling (Clark, 2020), which means that the actions of parents may be more impactful than any other parenting tactics. The influence of parents on the dietary habits of children is even visible among adolescents who desire an increase in independence and cultivate their eating practices during independent eating junctures (Dimitratos et al., 2022). The heavy involvement of a parent in their child's life can influence the dietary behaviors they develop (Sherman & Smith, 2019). However, it is unclear how children mirroring the implicit habits of their parents differs from eating what is purchased in the home. Parental qualities that affect said behaviors are family meals, parent dieting or irregular eating practices, and the stress of parents. Parental stress can stem from divorce, psychological illness, and parent-child conflict (Dimitratos et al., 2022). The genes of and the environment curated by the parents play a meaningful role in the eating habits of children. The living situations established by parents have featured the purchasing of inexpensive and energy dense foods that are unhealthy and often promote overeating and weight gain thus negatively affecting the growth and health of children (Savage et al., 2007).

Hypotheses

Hypothesis A: A relationship will present between the individual's food addiction score and perceived parental food addiction score.

Hypothesis B: Empathy will be positively correlated with both the individual's food addiction score and the perceived parental food addiction score. Additionally, highly empathetic individuals will be even more inclined to recognize food addiction in a parent and suffer from this condition.

Method

Participants

The sample of this study consisted of a total of 78 participants. The participants were recruited through Amazon Mechanical Turk. Originally there were 109 participants, however, 31 were eliminated if there was any indication that the participant's responses were not authentic, such as completing the survey within less than a minute. 31 of the participants were male and 47 of the participants were female. 90% of the participants were Caucasian, 7% were African

American/Black, 1% were Hispanic/Latinx, and 1% were Native American. All the participants were at least 18 years old.

Materials

The eating habits of the participants and their perception of their parent's eating habits were assessed through a modified 10-item Yale Food Addiction Scale (Brunault et al., 2020). This 5-point Likert scale was used by participants to rank the frequency of the prompts asked ranging from 0 = never to 4 = 4 or more times or daily. Additionally, a modified 10-item Empathy Quotient was also taken by the participants (Lawrence et al., 2004). This 4-point Likert scale assessed the participants' agreeability to the statements regarding their character and empathetic nature on a scale ranging from 1 = strongly disagree to 4 = strongly agree. These scales were included in a Microsoft Form Survey that was distributed on Amazon Mechanical Turk. Prior to responding to the aforementioned scales, participants answered demographic questions that identified their gender, age, weight, height, ethnicity, and household income. Questions pertaining to the participants' relationships with their parents were also asked.

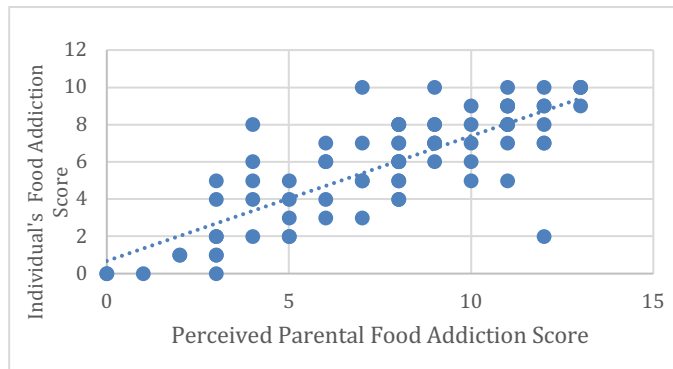
Procedure

Once the needed scales were acquired, modified, and included in the survey, the questionnaire was distributed on Amazon Mechanical Turk. Participants responded to the questionnaire and the responses to each scale were scored. Then, high and low empathy groups were created based on the empathy quotient score material. Finally, the data was analyzed through JASP, a statistical analysis program, where Spearman's rank correlations and independent samples *t*-tests were conducted.

Results

In order to address the first hypothesis of this research, which was to determine a relationship between the individual's food addiction score and perceived parental food addiction score, a Spearman's rank correlation was conducted. The results showed a strong positive correlation between the two variables, $r(78) = .77, p < .001$. Figure 1 indicates that as perceived parental food addiction score increased, the individual's food addiction score increased as well. This shows that the mere perception of food addiction in a parent is related to a child's development of a food addiction.

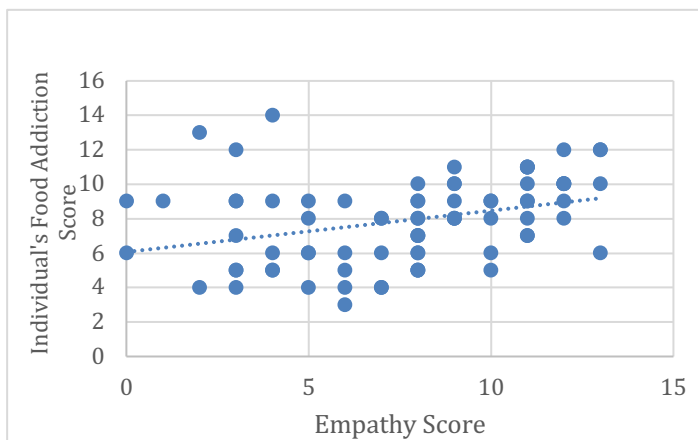
Figure 1. Individual's Food Addiction Score Vs. Perceived Parental Food Addiction Score



Note. A Spearman's rank correlation was conducted to evaluate the relationship between the individual's food addiction score and the perceived parental food addiction score.

The next hypothesis was to determine if empathy was a contributing factor to this relationship. A Spearman's rank correlation was computed to assess the relationship between empathy and individual food addiction. There was a moderately positive correlation between the individual's food addiction score and empathy, $r(78) = .42, p < .001$. The results displayed in Figure 2 show that as empathy increased, the individual's food addiction score also increased, to a moderate extent.

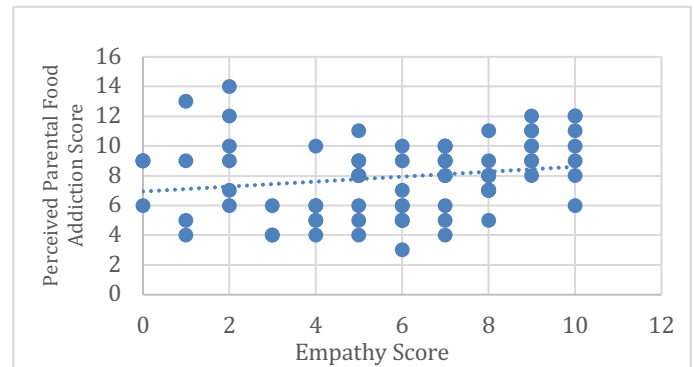
Figure 2. Individual's Food Addiction Score Vs. Empathy Score



Note. A Spearman's rank correlation was conducted to evaluate the relationship between empathy and the individual's food addiction score.

Subsequently, a Spearman's rank correlation was computed to assess the relationship between empathy and the perceived parental food addiction score. There was a weak, positive correlation between the two variables, $r(78) = .27, p = .016$. Figure 3 shows that as empathy score increased, perceived parental food addiction increased as well, to a weak extent. This finding can suggest that empathy might be associated with children better recognizing food addiction in parents.

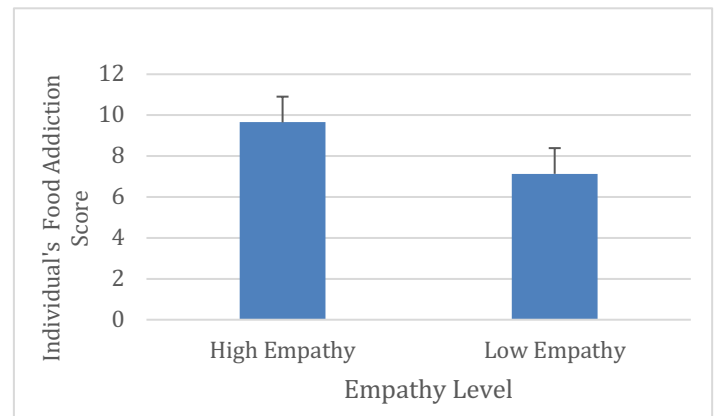
Figure 3. Perceived Parental Food Addiction Score Vs. Empathy Score



Note. A Spearman's rank correlation was conducted to evaluate the relationship between empathy and perceived parental food addiction.

To further explore the potential relationship between empathy and food addiction, an Independent Samples *t*-test was conducted to compare the difference in the individual's food addiction score between individuals with a high level of empathy and those with a low level of empathy. There was a significant difference in the individual food addiction scores among high empathy participants ($M = 9.6, SD = 3.5$) and low empathy participants ($M = 7.1, SD = 3.2$); $t(78) = 2.81, p = .006$. These results suggest that an individual's food addiction score can be predicted by empathy level. As shown in Figure 4, the food addiction score for children with high empathy is significantly higher than the food addiction score for children with low empathy group.

Figure 4. Individual's Food Addiction Score Vs. Empathy Level

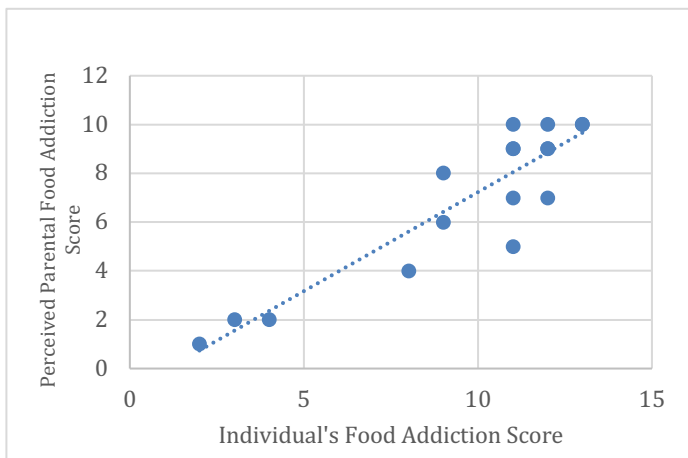


Note. An Independent Samples *t*-test was conducted to determine if there was a significant difference in individuals' food addiction scores between high and low empathy groups.

To further understand empathy's role in food addiction, a Spearman's rank correlation was computed to assess the relationship between individuals' food addiction scores and perceived parental food addiction scores among high empathy participants. There was a strong, positive correlation between the two variables, $r(17) = .823, p < .001$. Based on Figure 5, this means that for participants with high levels of empathy,

perceived parental food addiction score increases as individual food addiction score increases.

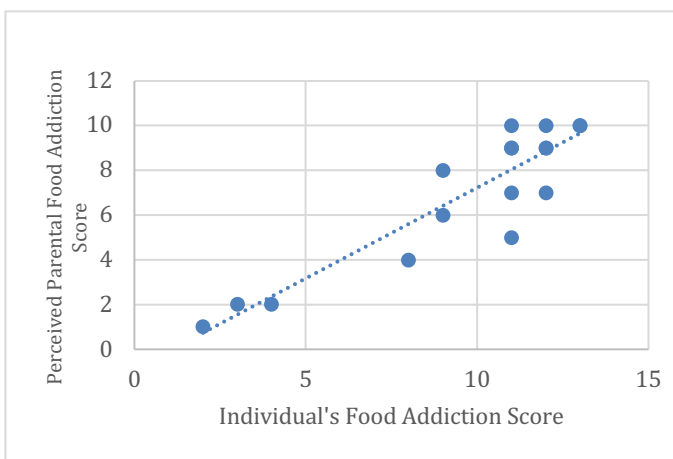
Figure 5. Perceived Parental Food Addiction Score Vs. Individual's Food Addiction Score in High Empathy Individuals



Note. A Spearman's rank correlation test was conducted to evaluate the relationship between an individual's food addiction score and perceived parental food addiction score among high empathy participants.

Then, another Spearman's rank correlation was computed to assess the relationship between individuals' food addiction scores and perceived parental food addiction scores among low empathy participants. Once again, there was a strong, positive correlation between the two variables $r(61) = .75, p < .001$. Figure 6 shows that as the individual's food addiction score increases, their perceived parental food addiction score also increases.

Figure 6. Perceived Parental Food Addiction Score Vs. Individual's Food Addiction Score in Low Empathy Individuals



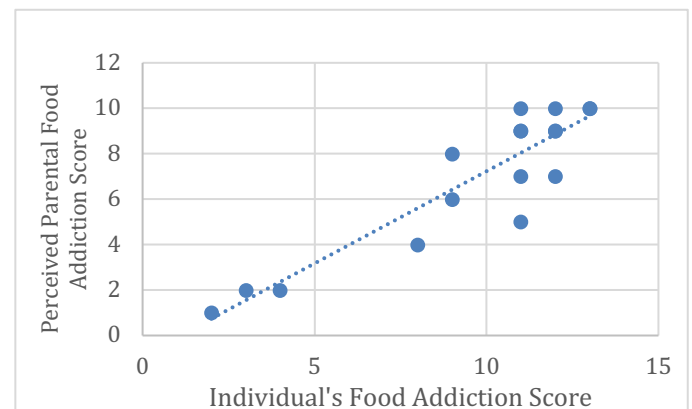
Note. A Spearman's rank correlation test was conducted to evaluate the relationship between individuals' food addiction scores and perceived parental food addiction scores among low empathy participants.

Based on the r -values associated with Figures 5 and 6, there is a stronger association between the individual's food addiction score and perceived parental food addiction score for high empathy participants. This means that the individual

food addiction score of children with low empathy is not affected as much by perceived parental food addiction in comparison to children with a high level of empathy.

In order to see how empathy might affect the relationship between individual food addiction and perceived parental food addiction, a ratio was taken between the two numerical values and then compared using an independent samples t -test. There was no significant difference in the ratios for high empathy participants ($M = 0.7, SD = 0.1$) and the ratios for low empathy participants ($M = 0.8, SD = 0.4$); $t(76) = -1.13, p = .263$. Despite the lack of significance, these tests help to show for the first time that high empathy individuals could be more vulnerable to food addiction, especially with parental modeling of food addiction.

Figure 7. Ratios Vs. Empathy Level



Note. An Independent Samples t -test was conducted to compare the ratios of individual vs. perceived parental food addiction values between high and low empathy groups.

Discussion

This study took an alternate approach to understanding the role of parents and diet by examining food addiction. For the first time, perception of food addiction was compared to one's personal level of food addiction. Additionally, the role of empathy was evaluated. This study was able to highlight the importance of parental modeling when it comes to the relationship their children form with food. While previous studies have shown that if parents overconsume food, children are more likely to overeat, this has never been studied through the lens of actual food addiction, a diagnosed dependency on food. For the first time, it was shown that the simple perception of food addiction in a parent is related to a child's development of food addiction themselves. This finding agrees with previous research, as it shows the depth of the influence that parents have on their children (Savage et al., 2007). This contributes to the body of knowledge that underscores the importance of parental modeling in terms of the relationship children develop with food (Clark, 2020). While the relationship between perceived parental food addiction and individual food addiction was true for the whole sample, those with a high level of empathy were more vulnerable to perceiving this.

While previous studies have revealed how parental overeating and high levels of stress can lead to a child overeating, this relationship has never been explored specifically as it relates to addictive behavior and empathy (Dimitratos et al., 2022). The discrepancy between the participants with low empathy and high empathy in terms of addiction to food and perception of it, although not significant, emphasizes empathy's ability to enable food addiction. This novel research indicates that empathetic children could be more vulnerable to developing a food addiction and perceiving it in a parent.

Overall, the findings agree with and build upon previous studies as they emphasize that parents play an imperative role in the eating practices developed by children (Dimitratos et al., 2022). Specifically, the way children perceive the dietary behaviors of their parents affects their risk of developing food addiction themselves. Additionally, how in tune a child is to the feelings and emotions of others may increase that risk of food addiction development and perception in parents.

Conclusion

It is important to note that there were limitations to this study. Only 78 participants partook in this study and did not equally represent different ethnic backgrounds. Future studies should look at a variety of ethnic backgrounds as research has shown that different cultures can foster different dynamics in the parent/child relationship (Bornstein, 2013). In addition, perceived parental food addiction was looked at holistically. Future studies could examine differences in how perceived maternal vs. paternal food addiction might differentially impact a child's eating habits.

This research was able to highlight the importance of parental modeling when it comes to the relationship that children form with food. While previous studies have revealed how parental overeating and high levels of emotion can lead to a child overeating, this relationship has never been explored as it relates to addictive behavior and empathy. This study showed that if a child merely believes their parent is addicted to food, they are more likely to develop this condition too. Furthermore, empathetic children are more vulnerable to food addiction and are more likely to be impacted by a parent's addictive food behavior. This type of research is crucial in advancing understanding of addiction, as it relates to food, and developing strategies to help individuals address this problem. Since food addiction is a known contributing factor to obesity, and obesity is associated with a massive number of health issues, it is crucial that we better understand the underlying factors contributing to this problem.

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The Effect of Source Prestige and Author Gender on Perceived Article Credibility

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Abstract

As internet usage increases, people are being bombarded with both factual and non-factual information. Many times, the readers' opinions related to the article's accuracy and perceived credibility change without fact-checking the data they read. Accordingly, it is important to understand what factors cause people to form or change their opinion with little or no supportive evidence. In prior research, several factors have been shown to influence how people will perceive the credibility of an article. Prestigious sources have been shown to increase perceived credibility, while gender of the author, in certain cases, can also impact perceived credibility; however, much more research is needed on this topic. For example, it is interesting to assess perceived source credibility among high school students, an age group less studied. Our experiment investigated the effects of source prestige and the gender of the researchers conducting a study on perceived credibility. Eighty-eight students (9th & 10th graders) from a mid-sized suburban high school were randomly assigned to read an excerpt from an article which discusses Oumuamua, the first interstellar object which passed through our solar system. In accordance with the stimulus, they were given the publisher (Harvard University/University of Eastern Minnesota), and gender of the researchers (male/female), which were indicated at the top of the article page. Participants were then asked questions regarding the article's perceived credibility. Compared to articles that were shown to have been published by the University of Eastern Minnesota, Harvard University-published articles received higher credibility ratings. Additionally, the perceived credibility of articles involving research conducted by male scientists was higher than that of articles involving research conducted by female scientists. The experiment suggests that elements of an article, specifically source prestige and gender, have an impact on the perceptions of article credibility.

The recent COVID-19 pandemic set the stage for one of the biggest spreads of misinformation in history. The pandemic was used to wage political battles, and opposing medical opinions were presented to the public through TV, the radio, and the internet. People around the globe were overwhelmed by the amount of political and medical information circulating through media sources. Aside from what seemed to be information originating from reliable sources, the public was bombarded with information from seemingly unreliable sources, leaving people to try and sort out what was true and what was false.

While the COVID-19 pandemic offered us a real-time glimpse into the dangers associated with the spread of false information, research has shown that there are different types of misinformation that can have a negative and dangerous effect on people and societies, especially in an era of global communication (Jia et al., 2022). For example, financial misinformation related to digital currencies and their true value can affect people's investment strategies, which could have devastating financial repercussions.

As people and societies encounter the continuous flow of misinformation, it is vital to understand how they judge and interpret information to be credible or not. What parameters do people use to make such a judgment? What influences their decisions? And more specifically, how do school-aged adolescents make such judgments? Our study aims to evaluate two potentially influencing factors, prestige of source and gender stereotypes. Understanding these, and other influencing factors, may offer ways to help individuals and societies to accurately differentiate between true and false information.

With the increasing use of social media outlets as news sources, the amount of information people are exposed to has increased. Much of this information is based on unverified reports, rumors, and intentionally misleading data (Rubin et al., 2016). With the Internet becoming the main source for seeking out information, the spread of such false information has skyrocketed (Nadarevic et al., 2020). The Internet also allows for the rapid spread of unsubstantiated rumors and conspiracy theories as it offers a direct and rapid path from

information producers to information consumers, thus changing the way users become informed and form an opinion (Del Vicario et al., 2016). In Del Vicario's research, bloggers (information producers) were able to convince many people (information consumers) that a false military exercise was actually a battle between two opposing U.S. forces and a beginning of a civil war in the U.S. Within the reality of widespread, rapid, multiple-source information, false information seems to spread significantly faster and more broadly than truthful information across a variety of informational categories. Furthermore, a study investigating the diffusion of verified true and false news stories distributed on Twitter from 2006 to 2017 concluded that false information diffused faster and more broadly than the truth in many categories of information, specifically information related to political news (Vosoughi et al., 2018).

With the increasing amount of false information people are exposed to, it is even more alarming to learn that many people have a hard time differentiating between true and false information. As false information is so widespread, it is important to understand the public's ability to differentiate between real and fake news. Recent polls indicate that a significant portion of Americans (47%) report having difficulty distinguishing between real and fake news (Pehlivanoglu et al., 2021). The increasing number of different opinions shared through social media makes the task of distinguishing between what is true and what is false more difficult (Shu et al., 2017).

With widespread and easy access to multiple information sources, people use various factors to try and distinguish between accurate and inaccurate information. Source prestige and perceived publisher credibility are some of the judgment cues that people use to evaluate the accuracy of information. Studies have shown that information was perceived as being more accurate when presented by an alleged expert or reliable source than by laypersons or dubious news sources. This is due to the fact that the credibility of a source and the trustworthiness of an institution has a direct and substantial effect on the perceived credibility of the article (Nadarevic et al., 2020). Source credibility is also believed to be affected by the perceptions of source trustworthiness as well as the expertise of the publisher. This, in turn, affects how people perceive, process, and judge the information presented by the source (Hocevar et al., 2017). When people have a negative attitude towards a source, mainly because of the publisher, then the believability of the source is lower (Hohenburg et al., 2022). In addition, information provided by credible sources has a larger impact on recipients' beliefs, attitudes, and follow-up behaviors than information provided by non-credible sources (Wilson et al., 1993). Experiments have shown that when an article is published by a more prestigious, well-respected, or well-known institution people tend to have a more positive attitude toward the article and find the information trustworthy (Tormala et al., 2006). Reliance on the prestige of a source can at times have a negative effect as it may mislead readers to believe information is factual and discourage them from fact-checking its content (Hocevar et al., 2017).

In addition to focusing on the effects and impact of source prestige on perceived credibility, our research also examined the influence and effect of gender on perceived credibility. When trying to assess this link, it's important to first examine data which shows that men, at times, are still perceived as intellectually superior to women (Cislaghi et al., 2019). Throughout history, men have been perceived as having a higher level of intellectual ability than women (Storage et al., 2020). This phenomenon may be due in part to a gender stereotype that portrays men as more brilliant than women (Storage et al., 2020). In addition, research has shown that at times, due to unbased gender stereotypes, men are considered to be more competent than women (Storage et al., 2020). A possible outcome of such perceptions could be found in research that has shown that men are more likely to get employed than women, especially for jobs involving scientific research (Cislaghi et al., 2022). These biased attitudes and their consequences can help understand the link between gender and perceived information credibility.

Previous research has found that the perceived credibility of published media is influenced by the gender and expertise of the publisher. This research also found that male authors are considered more credible than female authors among active information seekers. (Armstrong & McAdams, 2009). In addition, research has also found that women are perceived as less persuasive than men in general, regardless of their presentation style (Winkler et al., 2017).

Many studies have analyzed what parameters affect perceived information credibility, but high school students have not been the focus of many of these studies. Overall, high school students heavily rely on Internet resources; therefore, we believe that this study addresses a significant research gap in the field of information credibility research.

In order to determine which factors impact perceived article credibility, we hypothesized that compared to people reading an article published by a well-known academic institution, people reading an article published by a less known academic institution would find the article to be less credible. Additionally, we also hypothesized that compared to female scientists, male scientists would be perceived as more credible.

Method

Participants

The study consisted of 88 participants, 9th and 10th grade students in a mid-sized suburban high school. The survey was conducted within the school's English classrooms. Our demographic information showed that 48.9% of our sample identified as male, 43.2% identified as female, 5.7% identified as other, and 2.3% of our sample chose the "prefer not to say" option.

Experimental Stimuli

The study presented a short article, based on an article published in the Harvard Gazette, in which the excerpt discussed “Oumuamua,” an interstellar object which passed through our solar system, and which some scientists proclaim may have originated from an alien culture (Harvard University Gazette). This article was chosen knowing that participants would have little prior knowledge about this topic and thus not be biased toward the article’s content.

Participants were randomly assigned to one of four conditions conducted through a 2 x 2 design. All conditions were identical except for the publisher (source) and authors of the article. Some participants were assigned an article published by a prestigious source (Harvard University), and some participants were assigned an article published by a fictitious university (University of Eastern Minnesota). Gender was also a differentiating factor between conditions and was indicated by the name of the authors (“Kevin F. Barlowe, John Bialy” or “Charlotte F. Barlowe, Anna Bialy”). The authors’ names were chosen at random, and it was ensured that potential names were not considered gender neutral. Last and middle names remained the same between conditions in order to reduce potential confounding variables.

Experimental Stimuli

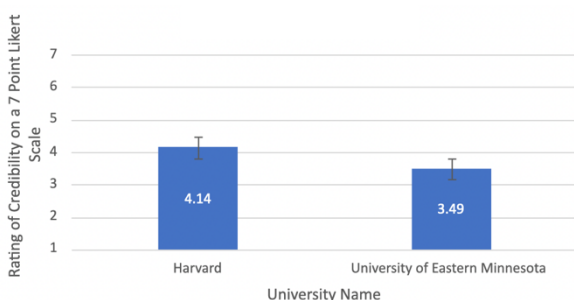
Dependent Measures

After reading the article presented to them and having seen their assigned publisher (source) and authors, the participants were presented with a series of statements to determine “article credibility”. On 7-point Likert-type scales, participants were posed with three statements and had to rate their agreement with them (1 = “strongly disagree”, 7 = “strongly agree”). The credibility scale consisted of the following statements: “I believe this source,” “The researchers are credible,” and “I would use this source if I was doing research on the topic.” These statements all represented the original scale of “article credibility” which was self-created.

Results

An ANOVA showed that our first hypothesis, that people reading an article published by a prestigious source will find the article to be more credible, was supported, $F(1, 87) = 5.83, p = .02$. Participants rated the Harvard sources as significantly more credible than the Eastern Minnesota source. This is shown in Figure 1.

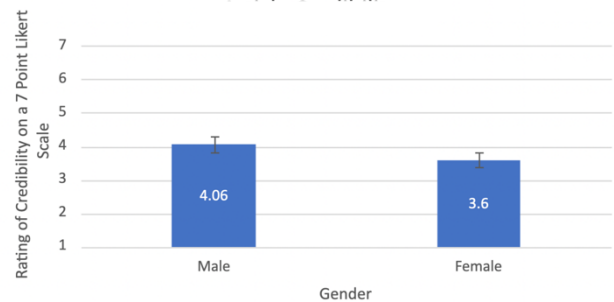
Figure 1. Effect of Source on Perceived Article Credibility



Note. Error bars show ± 1 standard error

The 2-way ANOVA also showed that people reading an article written by male authors found the article to be slightly more credible. This finding approached significance, $F(1, 87) = 3.24, p = .08$. This is shown in Figure 2. Finally, there was no significant interaction between perceived article credibility and gender.

Figure 2. Effect of Source on Perceived Article Credibility



Note. Error bars show ± 1 standard error

Discussion

Source Prestige

Our results supported our hypothesis that articles published by prestigious institutions are indeed perceived as more credible. Some explanations for these results can be because the prestige of a source has a direct and substantial effect on perceived article credibility (Nadarevic et al., 2020). This factor was further sustained in research that showed that if an article is published by a more prestigious or well-known institution, people tend to have a more positive attitude towards the article (Tormala et al., 2006). Further support can be found in research which has shown that source credibility is believed to be impacted by both perceptions of source trustworthiness and expertise (Hocevar et al., 2017). On the other hand, previous research has shown that unknown institutions or sources may cause people to have a negative attitude, or a bias towards such a source thus making its content less believable and less reliable (Hohenburg et al., 2022).

Accordingly, when participants were reading an article published by the “University of Eastern Minnesota,” an institution which they have never heard of, they may have regarded the information presented by this source to be unreliable.

Author Gender

Our research shows that the results related to our second hypothesis, that compared to female scientists, male scientists will be perceived as more credible, approached significance for the claim that male authors will be perceived as more credible. Some explanations for these results could arise from the fact that previous research has shown that throughout

history, men have been perceived as having a higher level of intellectual ability than women (Storage et al., 2020). Research has also shown that in certain cases, perceived male superiority leads to increased reliability and credibility of information published by males. For example, gender stereotypes impact perceived information credibility within certain categories of news (Haim & Maurus, 2021). Research published by a male author is likely to be trusted when compared to the work of a female author. The reason our results only approached significance can be due to our limited sample size combined with the fact that younger high school students are less susceptible to gender bias.

Limitations and Further Study

Some limitations we faced in our study include our relatively small sample size. Our sample consisted of 88 participants who were 9th and 10th graders in a mid-sized suburban high school, thus not fully representing the high school's population.

Our study can be further expanded to research the effect of prior opinions and biases on the credibility of articles. This would mean participants who had pre-existing knowledge about the article topic prior to completing the survey, would likely be less affected by the source of the article or gender of the scientist. We could also examine if there is a connection between the perceived credibility of the scientist, based on gender, and the gender of the participant completing the survey. A follow-up study could include elements such as school logos to reinforce who the article is published by and also include a photo of the researchers/author to reinforce who conducted the study. Additional age demographics should also be tested, and results relating to causes for perceived article credibility be compared between generations. As noted, this research should include more participants with a larger pool of age groups and demographics from which to choose from.

Conclusion

The recent COVID-19 pandemic set the stage for one of the biggest spreads of misinformation in history. The pandemic was used to wage political battles, and opposing medical opinions were presented to the public through TV, radio, and the Internet. People around the globe were overwhelmed by the amount of political and medical information circulating through multiple media sources. Aside from information originating from reliable sources, the public was bombarded with information from seemingly unreliable sources, leaving people to try and sort out what is true and what is false.

In the era of global communication, society and individuals are exposed, on a daily basis, to tremendous amounts of information, much of it being false. Such misinformation can have negative and dangerous effects, so it is important to understand which factors influence people to interpret information to be credible or not. Identifying and understanding these influencing factors may offer ways to help individuals to differentiate between what is true and false.

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A Linear Regression, Sentiment, and Natural Language Processing Analysis of Dental Attendance Disparity Factors

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Abstract

A lack of dental visits has been found to predict both oral diseases (cavities and gingivitis) and complex diseases including Diabetes, Alzheimer's Disease, Periodontitis, and cardiovascular disease. I used linear regressions, sentiment analysis, and natural language processing to identify factors associated with decreased participation in dental visits among Americans. Additionally, I created two different word clouds that presented a visual representation of public Tweets showcasing how individuals feel about going to the dentist. The common themes in the word clouds included affordability and appointments. Furthermore, I conducted multiple linear regressions to determine the effect of various independent variables on the likelihood of individuals delaying personal and family care and the out-of-pocket expenditures for self and family. The most influential factors that contributed to the results of these multiple linear regressions included possessing insurance, age, gender, marital status, and earnings. Importantly, the socioeconomic factors of Americans indicate that many people avoid the dentist due to the cost of dental procedures.

Oral health and hygiene have been implicated in diseases elsewhere in the body including Alzheimer's Disease, Cardiovascular Disease, and Diabetes (Lockhart, 2012; Poudel, 2018; Preshaw, 2011). These diseases kill more than 906,146 Americans each year ("2021 Alzheimer's", 2021; "Statistics About," 2019) and although the causes and progression of these illnesses vary, a disparity in dental visits appears to be a significant predictor of illnesses since there is a significant decrease in patient attendance ("Disparities in," 2021). Given that large percentages of surveyed participants do not see a dentist, results suggest Americans may be overlooking oral health as a significant preventative measure for serious diseases (Michas, 2022). The purpose of my study was to explore which factors have the most significant effects on Americans to delay dental care by examining the variables of age, marital status, earnings, race, and political party.

Socioeconomics

Dentists generally recommend an annual dental visit to check for healthy bacteria, oral cancers, anomalies, and periodontitis (Kay, 1999). However, the socioeconomic status of families may reinforce disparities in dental attendance. A survey conducted by the Egyptian Pediatric Association Gazette identified that the dental health of children is

influenced by the oral hygiene behavior of children, which is derived from the socioeconomic status of their family (Aslan Ceylan et al., 2018). Families of a higher socioeconomic status reported better oral hygiene habits including tooth brushing, decreased sugar consumption, regular dental examinations, and adequate fluoride supplementation which led to fewer caries of the teeth of patients. According to Statista, disparities in attendance existed even in 2019, with over 1/3 of the American population having not seen a dentist in the past 12 months - a statistic that decreased by an additional 3.2% in 2022. When examining ethnicity and race as factors of attendance for the same years, all ethnicities and race groups showed decreased attendance in 2020 (Elflein, 2022). Among the ethnicities with the highest level of attendance were Non-Hispanic Asians (64.3%) and Non-Hispanic Whites (66.6%) in 2020. As a factor of gender, women (65.8%) reported more visits to the dentist compared to men (59.6%) in 2020 (Elflein, 2022).

Dental visits can be expensive and when procedures are needed to be performed such as cavity fillings, wisdom teeth extractions, and braces, the cost can increase drastically. Dental exams can cost from \$0 to \$550 depending on insurance coverage; individuals who do not have insurance have to pay out-of-pocket for the routine exam which can be from \$80 to \$120 ("How much", 2021). Insurance coverage

may restrict which procedures are covered due to being case-dependent. Many dental insurance companies will cover a percentage of preventative, basic, and major restorative care procedures. Almost half of insured Americans are unhappy with their insurance policy (Black, 2021). The average American considers certain criteria when visiting the dentist such as noticing if the dental clinic is in-network with their insurance provider to avoid major expenses. A survey found that 82% of adults with insurance coverage visited the dentist at least once during 2021, but this proportion was 55% percent among adults with no insurance. This gap was slightly lower when comparing children (Elfein, 2021).

COVID-19

In addition to decreased dental care as a result of demographic variables, many offices around the world had to limit and eventually stop any non-emergency procedures in 2020. So, while pandemic appointments increased by 84% compared to the pre-pandemic period, the number of canceled visits increased from 15% to 50% (Migas, 2022). Canceling and postponing dental visits negatively impacted overall physical health while also increasing healthcare costs and decreasing patient visit quality (Ceylan, 2022; Migas, 2022).

Factors that may have existed pre-pandemic also impact dental attendance, including dentophobia which affects approximately 36% of the population. This anxiety can have serious effects on the health of individuals as it presents a barrier for dental visits (Beaton et al., 2014). Many people feel afraid to go to the dentist (dentophobia) which can negatively affect their health. Additionally, due to COVID-19 affecting the health of many Americans, dentophobia of patients and the avoidance of dental appointments may have increased from the fear of catching COVID while at the dentist's office. The exposure of one's mouth and airways to a potentially deadly infection may also affect one's comfort with dental visits (Tofangchiha, 2022).

As the world begins to recover from the COVID-19 pandemic, Americans are being encouraged to visit more healthcare facilities, such as the dentist, to address the treatment they deferred as a result of the pandemic. This paper will explore and quantify the factors that are impeding dental visits by integrating linear regression modeling, natural language processing, and word cloud visualization. I wanted to quantify and qualify the effects of my data, which was unique to my study since I analyzed my data and two different nuanced methods. Quantifying the variables through the regression modeling of survey data in terms of beta coefficients and effect sizes, allowed to understand the value of insurance and finances for patients. Qualifying the values through natural language processing demonstrates the diction analysis by analyzing word cloud frequencies and understanding themes that are present. This study is unique as it explores many factors contributing to dental attendance of various racial groups in America.

Hypotheses

H₁: Individuals who do not have insurance will be more likely to delay care for self and family than individuals with insurance.

H₂: The words associated with cost and insurance would be prominent in the dental-related word clouds.

H₃: The demographic factors will be considered in this study due to the impact they may carry on the results.

Methods

Materials for Descriptive and Regression Analysis in SPSS

Survey on Dental Care and Dental Insurance. Data were drawn from the 2016 Commonwealth Fund Health Insurance Survey distributed from July 12, 2016 to November 20, 2016 by the Princeton Survey Research Associates International. Data took the form of phone surveys of 6005 adult participants drawn from various states across the US. The participants were surveyed by phone and asked to share information about their health care, insurance coverage, and spending (Appendix A).

Statistical Package for the Social Sciences (v. 25).

I recoded data with values for "chose not to answer" or "did not remember" to a "system missing" value and I created bar graphs to visualize the trends for each of the survey questions. I calculated the median for the out-of-pocket costs, preferring this measure to the mean because of the mean's potential inaccuracy as the result of outliers. If the person reported spending no money out-of-pocket, it was recorded as a "system missing" value to avoid skewing the data.

Materials for Natural Language Processing (NLP)

Dental Tweet Datasets

Two Twitter datasets were used. The first was created by the researcher using 1000 tweets drawn from the Twitter API. The second was drawn from a Kaggle data titled: *Tweets Related to Dental Care Affordability and Dental and Opioid Use*. The tweets were chosen based on searching the keywords "dentistry" and "dentist" on Twitter because they related to the topic.

Python Packages for Twitter Scraping (Tweepy).

In order to conduct Twitter scraping I used Python packages: Pandas, Numpy, Matplotlib, and Pyplot. The Python packages NLTK, OS, word cloud for diction analysis, and word cloud visualization.

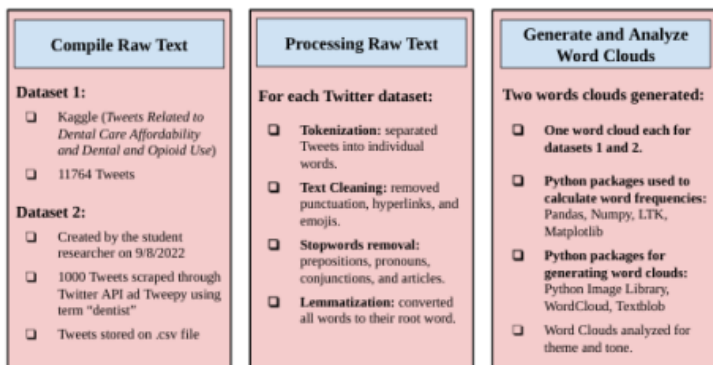
Regression Analyses Using SPSS

I conducted inferential analysis using multiple linear regression modeling to explore the relationship between the independent variables of age, marital status, earnings, race, political party, and possession of insurance and the dependent variables of delaying personal care, delaying family care, out-of-pocket expenditures for self, and out-of-pocket expenditures for family. A table summarizing these results is located in Appendix B.

Natural Language Processing Using Python Analyses Using SPSS

Natural Language Processing was used to collect data for the creation of a word cloud through Twitter Sentiment Analysis (Figure 1).

Figure 1. Procedure for Word Cloud Analysis



Importing Packages

Using Jupyter Notebook in Python, I first imported Pandas and Numpy in order to conduct statistical analyses of diction related to dental care affordability. I imported Textblob to process the Twitter data and visualized the data using a word cloud.

Data Processing

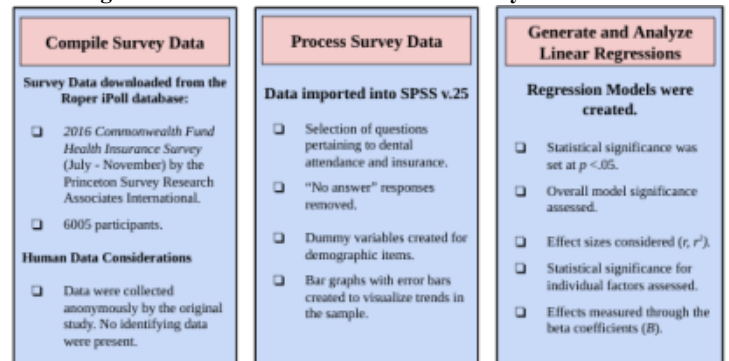
The tweets from Kaggle and the tweets I scraped were loaded into a notebook using the pd_readcsv command. Each tweet was composed of a string. I performed segmentations, removed stopwords (words such as, are, the), tokenized the words, stemmed the words, and conducted lemmatization (the gender of words: run, running, runs, ran are all the same). I also removed emojis, usernames, and retweets (RT).

Word Cloud Visualization and Analysis

Using the Python package word cloud, I created two word clouds for the dental tweets based on the frequency of the remaining words. The size of the words appeared as a function of their frequency in the tweets dataset – consequently, the larger the word, the more frequently it

appeared in the dataset. I interpreted the word cloud by identifying themes among the words.

Figure 2. Procedure for Word Cloud Analysis



Results

Twitter Sentiment Analysis

Word Cloud A

Word Cloud A was generated from Python which displays a visual representation of the thoughts of individuals from a Twitter database on their opinion of the dentist in the United Kingdom, with 11764 Tweets (Figure 3). There are many words that are represented that convey the thematic elements of dental affordability. The larger words in Word Cloud A include "afford," "dentist," and "go."

Word Cloud B

Word Cloud B was generated from Python which displays a visual representation of the thoughts of individuals from a Twitter database on their opinion of the dentist in the United States of America, with 1000 Tweets (Figure 3). There are many words that are represented that convey the thematic elements of dental appointments. In Word Cloud B, the largest words are "dentist," "dental," and "teeth."

Figure 1. Method for Interpreting a Python Word Cloud



Private Health Insurance Coverage

I ran a Linear Regression model to determine if there was a relationship between the independent variables (age, marital status, earnings, race, political party) and the dependent variable (whether the individual was personally covered by private health insurance offered through an employer or

union). The overall model was statistically significant ($p < .05$). The independent factors that had a p -value of less than .05 were as follows:

- **Age.** Older individuals were less likely to have private health insurance ($B = -.19$).
- **Marital Status.** Married individuals were more likely to have private health insurance ($B = .10$).
- **Earnings.** Individuals who earned less than 35k were less likely to be covered by private health insurance ($B = .37$).
- **Race.** The only identified race that was statistically significant was that of Native Americans suggesting that Native Americans are less likely to have private health insurance ($B = -.03$).
- **Political Party.** Republicans were more likely to have private health insurance than Democrats ($B = .08$).

Delaying Personal Care

The overall model was statistically significant ($p < .05$). The r -value was .23 and the r^2 value was .05. The following independent variables were statistically significant ($p < .05$):

- **Private Personal Insurance.** Individuals who had personal insurance were less likely to delay personal care ($B = -.18$).
- **Age.** Older individuals were less likely to delay care ($B = -.14$).
- **Marital Status.** Married individuals were slightly more likely to delay care ($B = .01$).
- **Earnings.** Individuals earning less than 35k were more likely to delay care ($B = .07$).
- **Race.** Only Native Americans showed a slightly higher likelihood of delaying personal care ($B = .01$).
- **Political Party.** Democrats also showed a slightly higher likelihood of delaying personal care ($B = .01$).

Delaying Family Care

The overall model was statistically significant ($p < .05$). The r -value was .15 and the r^2 value was .02. The following independent variables were statistically significant ($p < .05$):

- **Private Family Insurance.** Individuals who had family insurance were less likely to delay family care ($B = -.10$).
- **Age.** Older individuals were less likely to delay care ($B = -.59$).
- **Marital Status.** Married individuals were more likely to delay care ($B = .05$).
- **Earnings.** Individuals earning less than 35k were more likely to delay care ($B = .08$).

Out-of-Pocket Expenditures for Self

The overall model was statistically significant ($p < .05$). The r -value was .18 and the r^2 value was .03. The following independent variables were statistically significant ($p < .05$):

- **Private Health Insurance.** Individuals who were personally covered by health insurance were less likely to

pay out-of-pocket spending ($B = -.07$).

- **Age.** Older individuals were slightly more likely to pay out-of-pocket ($B = .03$).
- **Marital Status.** A married individual was less likely to pay out-of-pocket ($B = -.02$).
- **Earnings.** An individual who earned less than 35k was less likely to pay out-of-pocket which may be due to not earning enough ($B = -.05$).
- **Race.** All of the races had positive $B_{(\text{constant})}$ which shows that they were more likely to pay out-of-pocket ($B = -.01$).

Out-of-Pocket Expenditures for Family

The overall model was statistically significant ($p < .05$). The r -value was .10 and the r^2 value was .01. The following independent variables were statistically significant ($p < .05$):

- **Private Family Insurance.** Individuals who had insurance to cover their child's procedure were less likely to pay out-of-pocket because they were spending less ($B = -.06$).
- **Age.** Older individuals were less likely to pay out-of-pocket for their child's procedure ($B = -.01$).
- **Marital Status.** Married individuals were more likely to pay out-of-pocket for their child's procedure ($B = .08$).
- **Earnings.** Individuals that earned less than 35k were less likely to pay out-of-pocket ($B = -.05$).
- **Political Party.** The Republican and Independent party identifiers were slightly more likely to pay out-of-pocket ($B = .01$ and $B = .01$) than Democrats ($B = -.02$).

Discussion

This study highlighted the disparities in dental attendance. The results showcased that dental attendance across many demographic groups was shaped by their access to dental insurance. The individuals most likely to have health insurance included those who were younger, married, earning more than \$35,000, and Republican. Americans who were more likely to delay personal health care included those who were uninsured, younger, married, earning less than \$35,000, and Democrat. Individuals who were most likely to delay family care included those with no family insurance, younger, married, earning less than \$35,000, and did not identify with a political party. Individuals most likely to pay out-of-pocket expenditures were those who were not covered by insurance, older, unmarried, earning less than \$35,000, and did not identify with a political party. Those who were willing to pay out-of-pocket expenditures for their family included those who were uninsured, younger, married, earning less than \$35,000, and a Republican or Independent party identifier. These results regarding insurance are expected, as those who don't have insurance are essentially forced to pay out-of-pocket.

The Gallup poll indicates that women had a higher dental attendance compared to men (Bushak, 2014). Additionally, much like the findings of my study, Whites were found in the Gallup poll to be more likely to visit the dentist than Blacks or

Hispanics. In 2019, the percentage of dental attendance of Whites was 68.3% while Blacks were 61.1% and Hispanics were 58.6%. In 2020, the percentage of dental attendance of Whites was 66.6% while Blacks were 56.8% and Hispanics were 55.3% (Elfein, 2022). This showcases that dental attendance has not improved much throughout the years from various races and ethnicities.

According to the Gallup poll, “Seventy percent of Whites and Asians visited in 2013, compared to the 55% of Blacks and Hispanics” (Bushak, 2014). This is similar to results from 2019 and 2020 as Whites and Asians had 68.3% and 70.1% of attendance in 2019 and 66.6% and 64.3% of attendance in 2020. The percentage of Blacks and Hispanics had 61.1% and 58.6% of attendance in 2019 and 56.8% and 55.3% of attendance in 2020 (Elfein, 2022). These results may be explained by the income level of these groups as a higher income would lead to a more likely chance to visit the dentist due to being able to afford the treatment.

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How Does Social Media Affect the Risk of Disordered Eating Through Unrealistic Beauty Standards?

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Abstract

An abundance of factors contribute to the development of disordered eating in various populations. This paper focuses on the involvement of social media usage and harmful social media posts that can cause a user to develop disordered eating behavior and a combination of depression, anxiety, stress, and feeling socially isolated. I was able to address the gap in past studies that have overlooked minority races and age group (ranging from 13 to 50 years old) in disordered eating behavior and the correlation of social media. This gap was addressed through the use of a questionnaire/survey, created by combining other questionnaires such as Identity and Eating Disorders (IDEA), a questionnaire evaluating identity and embodiment in eating disorder patients. This questionnaire/survey resulted in findings that individuals who use Instagram at all (compared to those who do not use Instagram) scored significantly higher on the depression, anxiety, and stress measures.

Eating disorders (ED) are a condition where one goes through abnormal eating patterns and develops a compulsive concern with their body image and weight (Shaw et al., 2004). It includes the persistent disturbance of eating that affects the amount of food consumption and can harm the body physically and mentally. The frequency of eating disorders has “increased over the study period from 3.5% for the 2000–2006 period to 7.8% for the 2013–2018 period” (Galmiche et al., 2019). This paper aimed to measure how different factors can influence the development of eating disorders in Asian American adolescents, specifically. Health and illness have become a cultural focus, with some factors promoting maintaining a slim athletic figure, especially seen in Eastern cultures (Penney & Kirk, 2015). While social media usage showed mixed evidence of beneficial outcomes, it also created harmful situations, such as isolation and social comparison (Clark et al., 2018). This can lead to typical symptoms of eating disorders when the development of dissatisfaction appears in people's self-perception, resulting in efforts to “improve”, for example, through restrictive diets and excessive exercise (Rodgers, 2016). However, as people of younger ages join social media platforms, factors such as stress, workload from school and extracurricular activities, and the unrealistic nature of photos on social media (e.g., photoshopped images and videos, altered photos, glorification of unhealthy and restrictive diets) may affect these adolescents differently than past generations. The amount of stress these factors cause can often lead to disordered eating behaviors in teenagers with high social media usage. In fact, disordered eating increased over the decade 1998–2008 across all

demographic sectors, but at a faster rate in males of lower socioeconomic classes, and older participants (Mitchison et al., 2014). As social media grows and expands, its positive and negative aspects will impact younger generations' self-esteem and body image concerns (Jean et al., 2020).

ED patients usually overvalue their body image and view themselves from a third-person perspective, seeing their bodies as objects. It causes them to alter their perceptual body image, which is the accuracy of body-size estimation relative to actual size (Stanghellini et al., 2011). Disordered eating usually falls within three categories: anorexia nervosa, bulimia nervosa, and a heterogeneous combination of anorexia nervosa and bulimia nervosa. Anorexia nervosa involves extreme body dysmorphia, intense dieting, fasting, and overexercising symptoms. Bulimia nervosa usually is the behavior of an individual who frequently eats large amounts and may purge. Disordered eating takes a huge toll on mental health, as the person potentially values their eating habits and body image over their health. Through the growing prevalence of social media, body image issues that often cause eating disorders may be occurring in younger age groups, as these groups now have access to various social media platforms that place emphasis and high value on one's appearance. This may also occur partly due to social media's portrayal of photoshopped and altered body images, creating societal pressure to achieve a certain body image—regardless of how realistic. Prior research has shown an association between social media dependence and an increased risk of eating disorders, especially among young adults. I hypothesized that the more a person sees unrealistic body standards on social

media, the higher their risk of developing eloping disordered eating and holding negative views of their body image.

The increase of users on social media platforms within the decade has almost tripled from 970 million in 2010 to the number passing 4.48 billion users in July 2021 (Clark, 2018). Many platforms, such as Instagram, have a category of "influencers" who have developed a large following and a moderate personal connection with their followers. While influencers have various benefits, such as peer support, information-sharing, and normalization of societal experiences, the downside of influential people is that some of them can cause toxic comparisons and unrealistic body standards. Social media can lead to psychological distress and concerns about body appearance (Jitosa et al., 2021). By constantly viewing often edited, photoshopped, or altered photos, social media users can risk developing a form of disordered eating (Arora et al., 2019). The pattern can lead to psychological distress, body image concerns, idealization of appearance when an individual focuses on their physical appearance in an obsessive, unhealthy way, self-presentation concerns, and eventually, the development of an ED. However, social media influence isn't the only cause of disordered eating. Many factors ranging from familial, social, cognitive, learning, personality, etc., have been studied and found to make a difference.

The negative psychological effects of unrealistic body standards presented by social media are concerning as these platforms continue to grow with increased number of influencers. While not all influencers have affected adolescents in a negative connotation, a large portion can change the habits of social media users. The main focuses are social isolation, emotional issues (e.g., depression, anxiety), and health issues (Elhai et al., 2011). The amount of time spent on social media is not the direct correlation; rather, the quality of the interaction on social media has more intense psychological outcomes. If the amount of time spent on social media involves social comparison, body image concerns (refer to a person feeling anxious, distressed, or self-conscious about particular body parts), or appearance idealization, the effects on mental health are more intense (Marks et al., 2020). In addition, aspects of perfectionism (which are more prominent in restrictive anorexia nervosa patients) are established as a risk factor for the relationship between the social media environment and eating disorders (He & Yang, 2022). The higher the degree of social media dependence and the planned self-control, the more likely individuals are to be influenced by social media's thin-ideal content and fall into unhealthy eating behaviors and body image dissatisfaction.

Variables such as health and income status also affect the risks of developing disordered eating. While the historical assumption revolves around wealthy and affluent young, white females diagnosed with eating disorders, I mainly focused on sampling Asian Americans (Hudson, 2007). Therefore, it is clear that disordered eating does not only fall upon the stereotypical healthy, white young female but among many different racial-ethnic groups that have failed to be reached properly. I aimed to address this by sampling a

specific range of the Asian American race and socioeconomic status of households.

I additionally proposed that the more extracurricular activities a person accumulated throughout their school year, the more likely they would be influenced by the restrictive diets, altered images, and the subtle promotion of disordered eating on social media. This theory is supported by the fact that employment status greatly impacts an individual's psychological wellbeing (Mulders-Jones, 2017).

I aimed to determine how much time a person spends on Instagram and assess the type of media they consume, focusing specifically on the Asian American population. I tried to comprehend how much depression, anxiety, and stress contribute to the causes and likelihood of an eating disorder developing. Measurements included how many selfies, food, sceneries, animals, etc. the plan was to examine the relationship between the duration of time spent and the type of posts encountered and the likelihood of disordered eating and body image satisfaction. In this paper, eating disorder is a restrictive or controlling disorder, while disordered eating is the behaviors themselves.

Method

Development of the Questionnaire

The survey was created with a combination of using multiple questions from established scales. One of the scales was Identity and Eating Disorders (IDEA): a questionnaire evaluating identity and embodiment in eating disorder patients. This questionnaire has 33 questions assessing how people with disordered eating patterns are affected by disturbances, including any of the behaviors eating disorders may cause and how they experience their own body (embodiment) and shape their identity. The responses ranged from one to four on the IDEA questionnaire; these items are assessed where one indicated "does not apply to me" and four indicated that the participant heavily agreed with the statement of the questionnaire.

Next, I used the Eating Questionnaire-A (EDE-A) while omitting questions 8, 13, 14, 15-28, and 30-34. These questions were not included to maintain relevance to the target population. Questions were omitted to shorten the length of the survey and some questions pertained to age groups that were not surveyed in the research group. The responses ranged from one to four, where one indicated "does not apply to me" and four indicated "strongly applies to me." Questions featured from this scale included "Have you been scared of losing control overeating?" and "Have you really wanted your stomach to be flat?"

I also used questions from the Adolescent Body Image Satisfaction Scale (ABISS). This questionnaire asked participants to rank how much they agreed with the statements such as "I am in control of my body" and "My body makes me feel confident." Finally, I used the Depression, Anxiety, and Stress Scale (DASS21) comprised of 21 item and three self-report scales designed to measure these emotional states. Responses ranged from zero being "Did not apply to me at all"

and three being “Applied to me very much or most of the time.”

Sampling allowed for the prevalence of Asian American participants and measure what their self-reported scores were. EDE-A and ABISS were used to combine questions to infer eating behaviors, while DASS21 was used for measuring the levels of stress overall. Participants were also asked about how much they used Instagram on a daily basis.

Participants

The mean age of this sample was about 25 years old ($M = 24.9$, $SD = 12.8$), and the minimum/youngest age was 13 years old, while the maximum/oldest age was 50 years old; additionally, 45.5% were younger than 18 years old and 54.5% were older than 18 years old. The gender breakdown of this sample was 30.3% male, 60.6% female, and 6% self-identified as something other than male or female. Of the school participants, 9.1% were in 9th grade, 30.3% were in 11th grade, and 18.2% were in 12th grade. For the rest of the participants, the grading system did not apply. Concerning parental education, 3% of the participants’ parents did not complete high school, 15.2% graduated high school (or earned a GED), 3% of the participants’ parents earned an associate degree, or completed trade school, 33.3% of the participants’ parents earned a bachelor’s degree, 39.4% of the participants’ parents earned a graduate or professional degree (e.g., doctor, lawyer, etc.). For the race demographic, 3% were American Indian or Alaska Native, 60.6%, .6% were Asian, 3% were Black or African American, and 27.3% were white.

Procedure

Once receiving IRB (Institutional Review Board) approval, I distributed the questionnaire through online platforms consisting of Discord, Reddit, local dentistry business, and peers in a middle-class suburban town in ss suburban town in the Bay Area in California. The survey was distributed through servers unassociated with random study topics, TV shows, sports, and books. Geographically, the demographics ranged from all across the nation, but most of the sample was based in California. Important variances were used to control avoiding social media platforms on Discord, Reddit, etc.; groups already having conversations on eating behaviors, disordered eating habits, and social media influence. I asked if the participants were under 18 and obtained informed parental consent if this was the case. I collected information about race/ethnicity, age, gender, grade, and parents’ highest level of education.

Analytic Plan

Using the Statistical Package for the Social Sciences (SPSS), average scores and frequency statistics of all independent and dependent variables were first assessed. Using independent-samples t-tests in SPSS, I analyzed the association between using vs. not using Instagram and the dependent variables—body image satisfaction and disordered

eating behaviors. Using linear regression in SPSS, I analyzed how the independent variables of interest (e.g., time spent on social media, type of posts shared and viewed on social media, and other factors such as depression, anxiety, and stress) were independently and simultaneously associated with the dependent variables of interest—body image satisfaction and disordered eating behaviors.

Results

The results of this questionnaire revealed that the participants had mean depression, anxiety, and stress scores (i.e., score on the DASS-21) of 19.4 ($SD = 14.2$) where scores ranged from 0 to 48, a mean score of 9.6 ($SD = 8.5$) for EDEA, which is the Eating Questionnaire, and a mean score of 9.7 ($SD = 4.8$) for ABISS, The Adolescent Body Image Satisfaction Scale. On average, 53.1% of the participants in the study used Instagram, and 46.9% of the participants did not use Instagram. Of the Instagram users, 25% used the app for 30 minutes or less, 21.9% used the app for around 1–2 hours a day, and 6.3% used the app for 3–4 hours a day. Focusing on the number of participants whose posts are selfies, 15.6% reported that 10% of their posts are selfies or less. 9.4% stated that around 10–25% were selfies, 3.1% reported that around 25–50% were selfies, and 12.5% reported that around 50–75% were selfies. When assessing what percent of participants’ posts are photoshopped, 50% reported that they photoshop very few of their photos (less than 10% of them), and 3.1% of the individuals reported that they photoshop 25–50% of their posts.

Through the data, I found that individuals who use Instagram at all scored significantly higher on the depression, anxiety, and stress measures ($t = -2.41$, $p = .022$), scored higher on the disordered eating behavior measures ($t = -2.39$, $p = .02$), and scored higher on the body dissatisfaction scale of ABISS ($t = -2.31$, $p = .028$). Specifically, I found that of the people who reported using Instagram, the majority had scored almost double the mean score of people who did not use Instagram on the DASS-21, EDEA, and ABISS scales. Individuals who use Instagram had a mean score of 24.7 ($SD = 14.6$) on the DASS-21 compared to those without ($M = 13.5$, $SD = 11.29$). On the EDEA scale, individuals who use Instagram had a mean score of 13.0 ($SD = 8.7$), while those who did not use the app ($M = 6.1$, $SD = 7.0$). Lastly, on the ABISS scale, Individuals who use Instagram had a mean score of 11.5 ($SD = 4.4$), and participants that do not use Instagram had a mean score of .8 ($SD = 4.5$).

However, duration of time spent on Instagram was not significantly associated with reports of depression/anxiety/stress, disordered eating behaviors, or body image dissatisfaction ($B = 4.85$, $p = .37$; $B = 3.05$, $p = .36$; $B = -0.61$, $p = .72$), respectively.

There was no significant effect of what percentage of participants’ photos were selfies on depression, anxiety, and stress scores ($B = -2.00$, $p = .20$). I also discovered through the data that the more an individual engaged in photoshopping their posted photos on social media, the higher the scores on the depression and anxiety scale of DASS-21 ($B = 27.29$, $p =$

.02). However, the more the participants *viewed* selfies and photoshopped images on their social media feeds, the lower they scored on the DASS-21 ($B = -10.67, p = .01; B = -7.71, p < .01$). The greater the percentage of photoshopped images the participants saw on their social media feeds was also associated with greater dissatisfaction with their body image ($B = -2.34, p = .04$).

Discussion

The results of this research showed us valuable information about the relationship between social media, disordered eating behaviors, body image dissatisfaction, and other factors, such as depression, anxiety, and stress. The relationship between social media and its effects on mental health has been studied before, and in this research, I can shed more details on this association. I was able to find that individuals who use Instagram score significantly higher on measures of depression, anxiety, and stress (as assessed through the DASS-21) compared to those who did not use Instagram (Clark et al., 2018). Another alarming finding was that Asian Americans who use Instagram scored, on average, nearly double on the depression, anxiety, and stress measures compared to non-Instagram users. The fact that the users who use Instagram scored significantly higher on depression, anxiety, and stress is concerning because there are currently over 2.35 billion monthly active Instagram users (Arora et al., 2019). The effects of social media on the mental health of specific adolescents and their development into adults are distressing and agitating (Jean et al., 2020).

One explanation for this concerning finding this research paper is due to the type of media that is shared on Instagram. The social media platform is known for its emphasis on visual images, and constantly consuming perceptible images that are purposely constructed and designed to cultivate ideal self-images can be taunting and misleading to users viewing these photoshopped and unrealistic images (Rodgers, 2016). This distorted reality can provoke negative thought processes in a user and can lead to further destruction of the well-being of this Instagram user. People viewing these images can develop a sense of inferiority and inadequacy of who they are and their body image. To address the high score on the anxiety and stress factor of the depression, anxiety, and stress scale of DASS-21, the pressure from peers to post images that are presented to show one as their ideal selves can produce higher levels of anxiety and stress.

However, I discovered that the time spent on Instagram was not significantly associated with disordered eating behavior and body image dissatisfaction. This reveals that the impact of social media images flooding the participants' Instagram feeds is not solely negative due to how much time they spend on the app but the specific images they view. This is an important finding for mental health professionals working with patients struggling with their body image because of Instagram usage. The amount of time they spend on the app does not correlate with how high the participants scored on the scale measuring their views on their body image. Instead, the type of content they consume throughout their day has a way more significant

impact than the amount of time spent (Arora et al., 2019). Another specific detail I discovered was that participants who engaged in more photoshopping of their posts reported higher scores on measures of depression, anxiety, and stress (DASS-21), which highlights concerns about the effects of altering one's appearance on someone's mental health. This suggests that the more a user allows the pressure of social media to post altered images of themselves to please the societal views of beauty, the higher their levels of depression, anxiety, and stress are. This specific finding should receive more research on the effects of mental health, ill-being, and overall health of social media user who consistently alters their photos. Further research should address how these users who photoshop their images view their own body and their eating behavior compared to a control group, which would be Instagram users who don't photoshop or alter any of their images, or people who don't use any social media.

A perplexing finding was that the more participants viewed photoshopped pictures on their social media feeds, the lower their scores of measures of depression, anxiety, and stress. This finding went against the original assumptions. Perhaps this finding came out of the individual knowing these images were photoshopped, and therefore do not let it affect their mental health. However, I'm able to see an association between seeing a high frequency of photoshopped pictures on social media and a higher rate of body dissatisfaction. This finding suggests that exposure to heavily photoshopped images may contribute to negative body image perceptions and may play a role in the development of body image issues (He & Yang, 2022). This is significant because there is a widespread amount of photoshopping apps that users can easily access on their cell phones, and these companies should be aware of their effects on their mental health and the behavior they can cause in users who download and consistently use their apps.

Limitations and Future Directions

Notwithstanding this study's strengths, there are limitations to this work. The study's correlational design makes it difficult to establish causality. Additionally, the sample size is small and relatively homogeneous in the demographic breakdown, limiting the generalizability of the results. Another limitation is that the whole study was based on self-reported responses and can easily be self-biased and skew the data. Participants may have overestimated or underestimated their measurement on the depression, anxiety, and stress scale, DASS-21, their measurements of the eating questionnaire, EDEA, and their measurements on the questionnaire, which was the Adolescent Body Image Satisfaction Scale. Additionally, the research primarily focused on how much it does not consider other social media platforms and their effects on adolescents and the rest of society. For future directions, I should focus on making the participant base much larger; this way, I could include more races, genders, and diversity to receive more accurate results. I should also make a more detailed survey questioning other social media platforms. Hence, I understand the impacts of other social media apps, especially since specific social

media are catered to specific demographics. Future studies should focus on the long-term effects of social media on adolescents' health and body image. If future research focuses on the factor's social media affects, I can gain more information on self-esteem, self-worth, and healthier eating behaviors in the next few generations.

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