

The Whitman Journal of Psychology

October 2017

Dear Readers,

I am excited to present to you the latest edition of the Whitman Journal of Psychology. This semester we had a particularly difficult time deciding which submissions to include, as we received many worthy options. After careful consideration, the Journal is confident that the following psychological research represents a wide variety of talented high school students from all over the country and world.

This year we received several submissions from students in China, and we are thrilled to include one in the Journal. It was inspiring to see interest in the Journal's work from the other side of the world, and it reaffirmed the notion that our generation is engaged. Regardless of the student's background, school or citizenship, we found that every submission was founded on hard work that each and every student committed to each paper. And for that, on behalf of the entire Journal's staff, I would like to thank all the high school students that worked diligently to submit their best work. It is because of your investment in the ever expanding field of psychology, that we are able to publish our Journal.

I would also like to thank the entire staff that worked passionately to finish the following Journal. Your enthusiasm and dedication to our work was uplifting throughout the process.

Finally, thank you to our faculty advisor, Ms. Del Savio: your knowledge and ambition for psychology and the Journal proved immensely helpful.

We hope you enjoy this edition of the Whitman Journal of Psychology, and we're excited to hear feedback, from you, our readers.

Sincerely,
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Editor-in-Chief

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Content

The Whitman Journal of Psychology is a forum in which student-conducted research in the field of psychology is recognized. The Journal contains research from many subject matters and is not limited to any specific field of study.

Manuscript Preparation

Authors should prepare manuscripts according to guidelines established in the Publication Manual of the American Psychology Association (6th ed.). The Journal reserves the right to modify APA style when necessary. Manuscripts should be no longer than 15 pages and should include an abstract. Additionally, all manuscripts must include a list of references as well as parenthetical documentation in accordance with APA style. Professional and other scholarly sources should constitute the majority of references. It is suggested that manuscripts include the following sections: introduction, methods, results and discussion. Manuscripts are not limited to these sections. Detailed requirements can be found on our website.

All manuscripts submitted for consideration may be mask (blind) reviewed at the request of the author. Clear notification must be given on the title page of a manuscript in order for it to be mask reviewed. It is the author’s responsibility to ensure that identification is omitted from the manuscript. All manuscripts submitted are subject to editing on both the basis of style and content. It is the author’s responsibility to ensure clarity of expression.

We accept submissions year round; however, there is a deadline to be considered for the next publication which can be found on our website.

Manuscript Submissions

Submissions should include a cover page with the following identifying information: author’s name, school affiliation, advisor’s name, address, phone number and e-mail address. Please e-mail a copy of your file(s) along with a cover letter with the requirements listed above to **whitmanpsychsubmissions@gmail.com**. You will get a confirmation e-mail once we have received your submission and are able to open the file(s).

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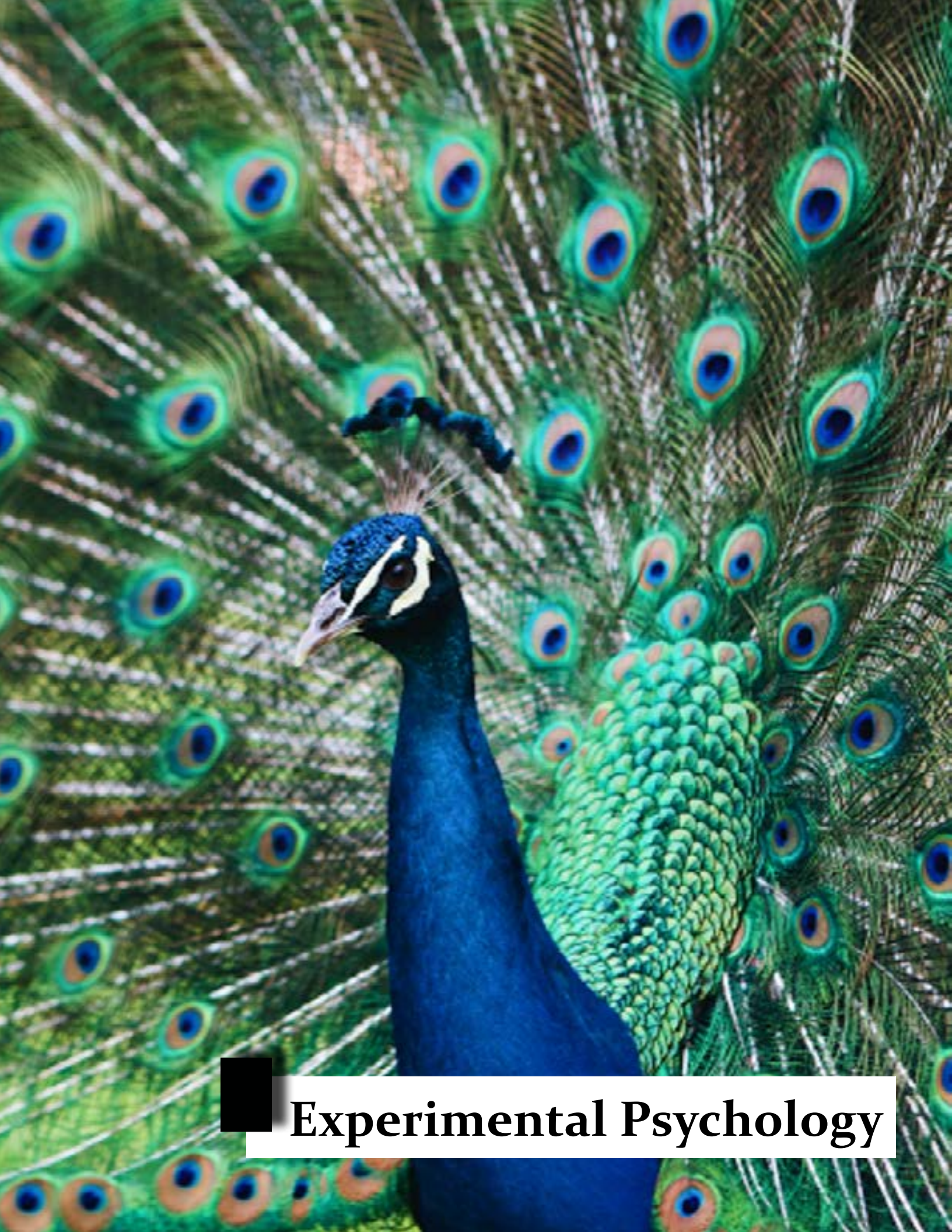
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Perception of Success Based on Culture, Society, Goals, Work Ethic, and Relationship with Family

Andrea Jore, Amanda Leibham, and Charissa Wallace

Saint Francis Xavier High School

Abstract

The present study was designed to determine how people perceived success based on societal influences, culture, and relationship with parents. A survey was sent out to a population of 587 local high school students with a final sample size of 136. Based on the responses, researchers concluded that people typically view successful people as smart, nice, and having a close family relationship. These results imply that people generally do not base success off of popularity and financial components; rather, they view it as an individual’s overall happiness and hardworking capabilities. The results of the present survey agree with previous studies and research, thus reaffirming the finding that success is not perceived as popularity, but as happiness and achieving goals.

Relationship

Success is loosely defined as the “achievement of desired visions and planned goals” (Mueller, 2016). Although the the idea of success is universal, the perceptions and implementations of success vary. The brain tracks success and failure in the prefrontal cortex and striatum (Berinato, 2010), and perceived success is also processed as a reward in the brain’s limbic system. Although the limbic system’s basic structure is consistent among individuals, it often functions differently and affects how each person views success.

Maslow’s Hierarchy of Needs may be construed as a visual representation of how success is perceived at different points in a person’s life. The sections of the pyramid are arranged from bottom to top: physiological needs, safety, love and belonging, esteem, and self-actualization. A person must achieve each step of the pyramid

in order to reach self-actualization— when one realizes their full potential and satisfies a successful life. Based on where each individual is on Maslow’s Hierarchy of Needs, one’s perceived success of themselves and those around them varies.

One’s definition of success can be influenced by one’s values. For example, collectivists and individualists have different values. Collectivists prioritize goals that benefit society over personal ambitions. Individualists, on the other hand, place greater importance on their personal goals over common goals for the benefit of the community (Triandis, 1989). Collectivists value commitment and loyalty to society, while individualists value independence and enjoyment (Dutta-Bergman & Wells, 2002). A person’s values affect how he/she interprets stimuli, makes choices, and prioritizes goals. As emphasized by numerous studies, cultural values mold individ-

ual viewpoints of success (Aypay, 2016).

Social media amplifies how culture defines success. People look to society and social media to find what is believed to be the ideal successful person; oftentimes these individuals are portrayed as having wealth and power (Mueller, 2016). Thus people who look towards society and social media will then view success as having wealth and power.

The purpose of the present study was to investigate how each individual perceives success based on lifestyles, values, and experiences. Specifically, the variables analyzed were society, culture, goals, work ethic, and one's relationship with his/her parents. Earlier studies have analyzed certain components that affect how success is defined individually; however, the factors of gender, society, culture, values, and relationship with parents were not all considered together at once. The multi-factor analysis accurately determined an individual's idea of success because it broadened the topics to consider multiple variables. When the students of a private high school were given a survey to measure how they perceive success, researchers predicted a positive correlation between one's cultural and societal values in relation to success.

Method

Participants: The population for the present study was 587 high school students with a sample size of 136 students. The survey was sent to all students, but participants were given the option to not take the survey or opt out at any point. Of the 587 students the survey was sent to, 136 responded to the survey. The participants were unaware of what was being tested in the survey. Ninety-five participants were female and 41 were male. 108 participants were Caucasian, 10 were Asian, 10 were Hispanic, 2 were European, 1 was Native American, and 5 selected a different ethnicity. All responses were kept anonymous and followed ethical guidelines.

Design: The present study was a correlational study. The independent variables included culture, society, goals, work ethic, and relationship with family to see how people viewed success based on all these variables at once. The dependent variable was the individual's perception of success based on the independent variables.

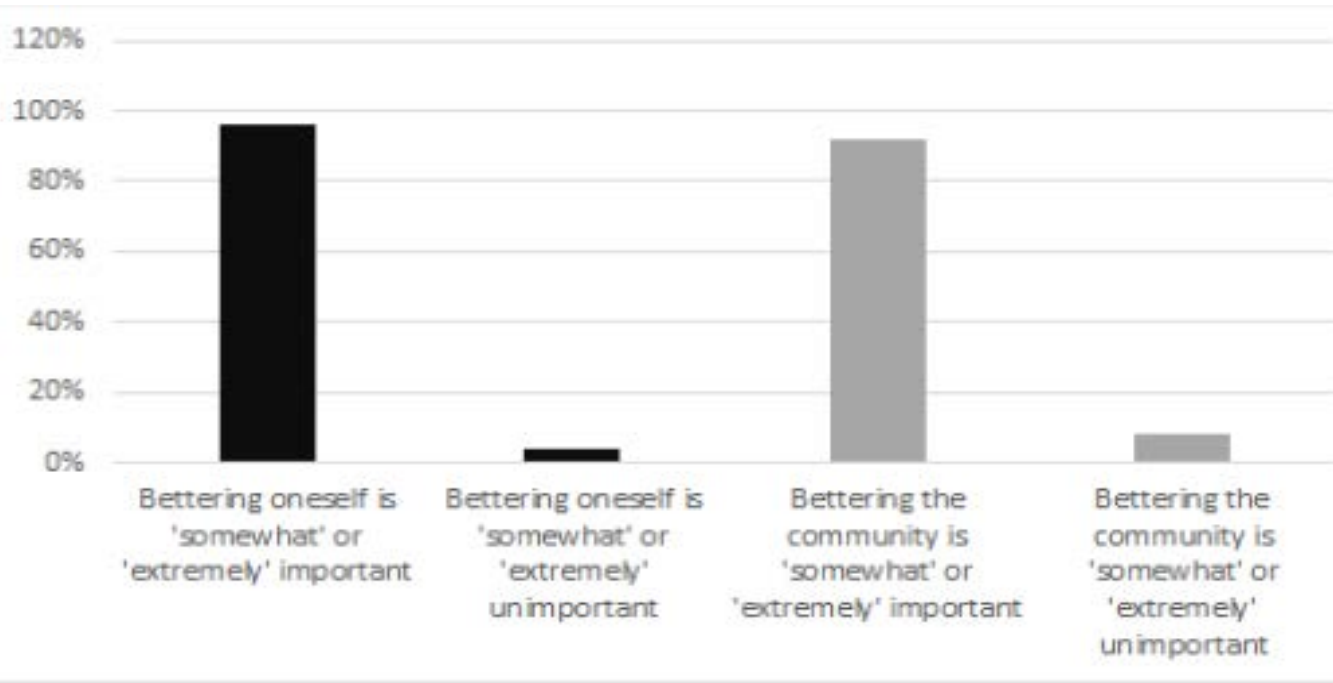
Materials: The survey, shown in Appendix A, was sent to every student at a private high school. The survey was made and analyzed via Google Forms and Google Sheets. The correlations found were put into various charts and graphs.

Procedure: There was no reward given for participating in the survey. Each participant was asked to identify his/her gender, ethnicity, out of school activities, and relationship with parents. Each participant then answered how important (from a scale of one to four) certain aspects of life are to his/herself. On the scale, one was 'Not Important,' two was 'Moderately Unimportant,' three was 'Somewhat Important,' and four was 'Extremely Important'.

Results

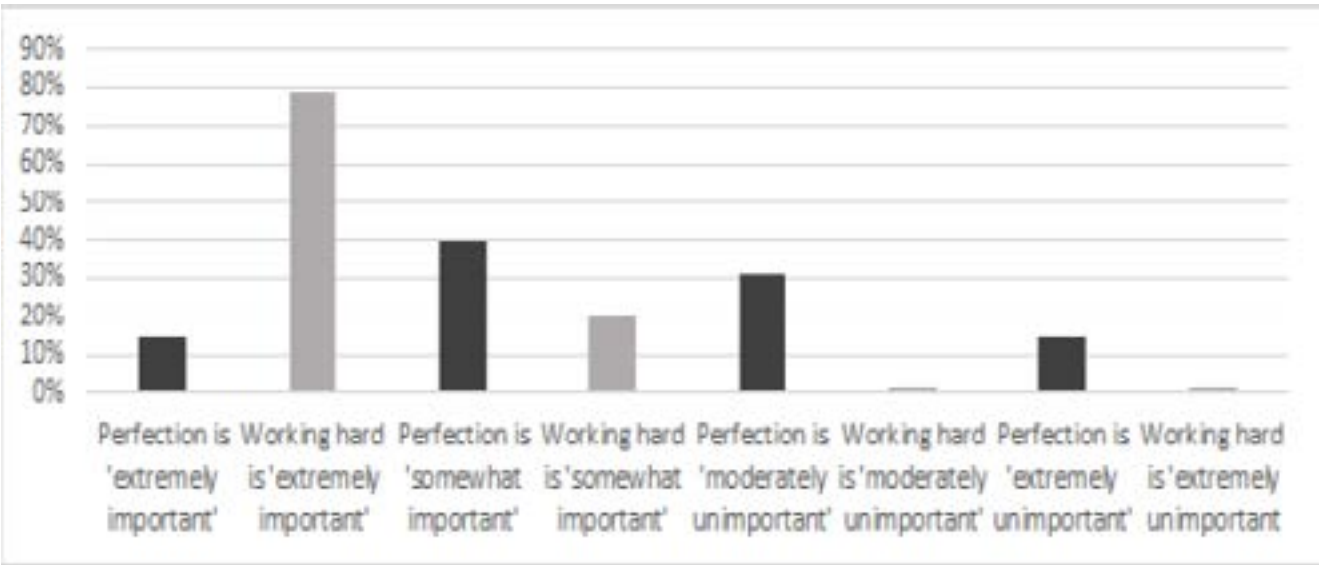
The results of the survey indicate that more participants perceive bettering oneself as more important than bettering the community; working hard as more important than perfection; and reaching goals and happiness as more important than money, popularity, and authority. Figures 1, 2, 3, and 4 depicted below represent the participants' responses in the study. 1 represents 'extremely unimportant,' 2 is 'somewhat unimportant,' 3 is 'somewhat important,' and 4 represents 'extremely important'.

Figure 1.1



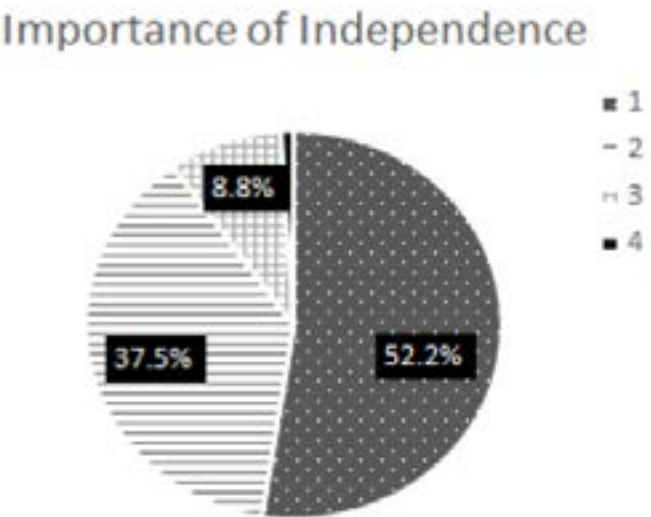
Bettering the community is 'extremely important' for 47.8% of the participants and 'somewhat important' for 44.1%. 91% of participants said that bettering the community or society is important. Bettering oneself is 'extremely important' for 64.7% and 'somewhat important' for 31.6% of participants. 96.3% of participants listed bettering oneself as important.

Figure 1.2



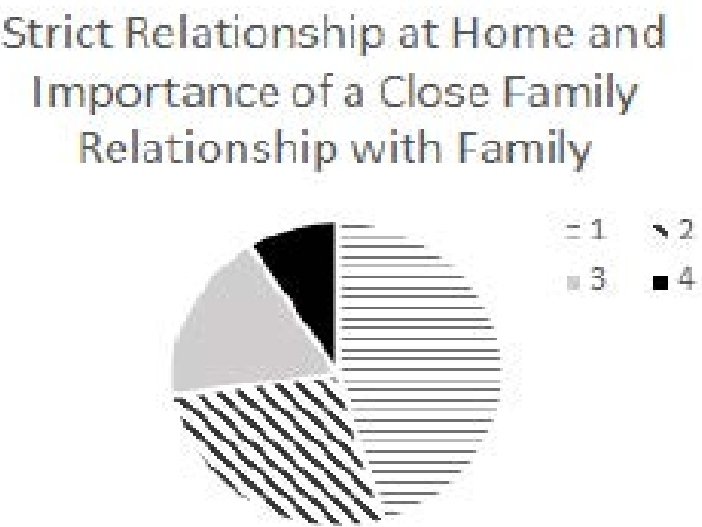
Working hard is 'extremely important' to 78.7% of the participants and 'somewhat important' to 19.9%. Perfection is 'somewhat important' to 39.7% of participants and 'moderately unimportant' to 30.9%. Perfection is 'extremely important' to 14.7%.

Figure1.1.3



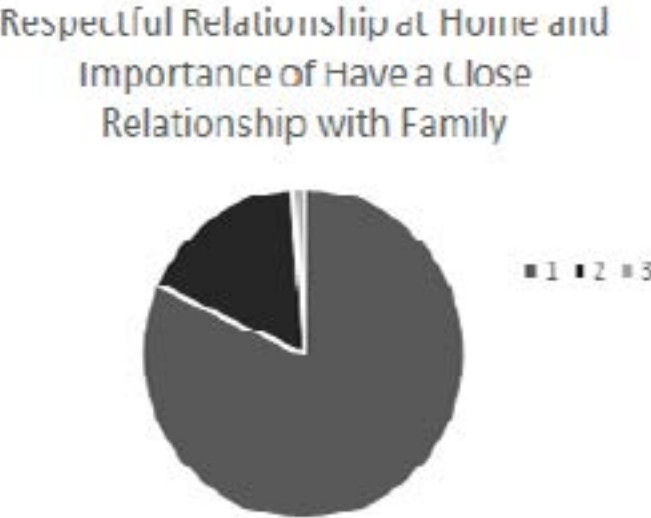
Over half, 52.2%, responded that independence is ‘extremely important’. 37.5% responded that independence is ‘somewhat important’. 8.8% responded that independence is ‘moderately unimportant’.

Figure1.1.5



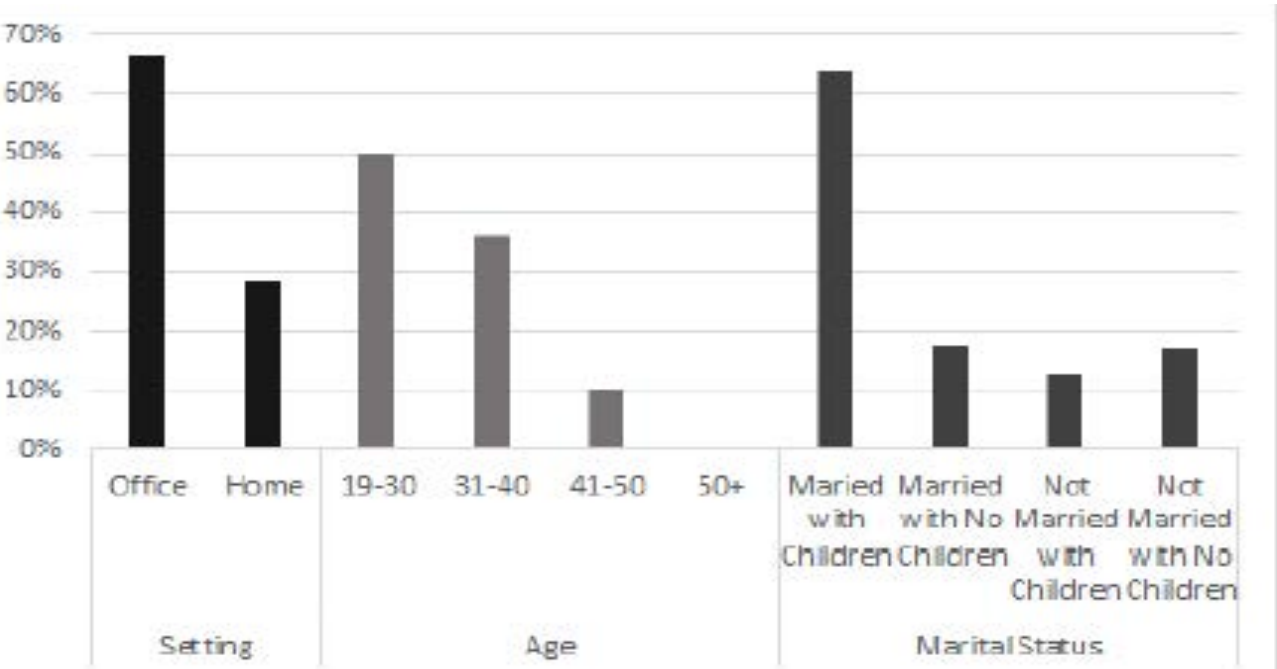
Of those who responded as having strict parents, 45.5% said that having a close relationship with family is ‘extremely important’, and 27.3% said this is ‘moderately unimportant’. 18.2% said that being close to family is ‘somewhat important’ and 9.1% said ‘unimportant’.

Figure1.1.4



Of the participants that said they had a respected relationship with their parents, 81.6% said that having a close relationship with family is ‘extremely important’ and 17.2% responded as ‘somewhat important’.

Figure1.1.6



66.2% responded the successful person was in an office for one of the choices, as multiple could be selected for the setting, and 28.7% responded home as a choice. 50.0% envisioned this person between the ages of 19-30, 36.0% said 31-40, 10.3% stated 41-50, and <1% selected 51+. 64.0% of participants envisioned a successful person as being married with children, 17.6% stated married with no children, 12.5% selected not married with children, and 16.9% stated not married with no children.

Discussion

The hypothesis was supported since a majority of participants' responses concluded that they viewed success in terms of happiness and achieving goals. The minority of participants' responses concluded that success was viewed as popularity and wealth. There were no outstanding differences between the male and female perceptions of success.

Culture plays a role in one's values and therefore impacts perceptions of success. Participants rated 'bettering oneself' as important more often than 'bettering the community/society', a difference of roughly 5%, which reflects an individualistic viewpoint (see Figure 1.1). According to Figure 1.3, about 89.7% of participants rated independence as 'somewhat' to 'extremely' important. These results showed how individualistic and collectivistic cultural views affect how important bettering oneself, bettering the community/society, and independence are in society.

Societal norms frequently idealize the prominent business person as a dominant indication of success. Supporting the theory, Figure 1.6 shows that about 67.6% of people envisioned a successful person in the setting of an office. Age is also involved in societal roles. As shown in Figure 1.6, about 50% of participants responded that the successful person envisioned was between the ages of 19 and 30. In Figure 1.6, around 64% of participants said that the envisioned successful person was married and had children. From these results, a clear societal construct is shown of what a stereotypical successful person should be - a young mother/father and spouse working in an office.

In Figure 1.2, about 78.7% of participants listed working hard as 'extremely important'. In Figure 1.2, 14.7% of participants said that perfection is 'extremely important'. The participants valued the overall process of hard and purposeful work over a perfect end result.

In general, success is about reaching

goals, which contains different implications for different individuals. From the results, aspects such as money, popularity, and authority were rated as less important than happiness, close relationships, and working hard.

Maslow's Hierarchy of Needs can help explain many of the results. Without basic safety needs met, a person will not achieve self-actualization. In Figure 1.6, around 64% of participants envisioned a successful person as being married with children, which would satisfy the needs of love and belonging. Approval would also fall under belonging. Maslow's Hierarchy of Needs is the process of self-betterment in order to achieve self-actualization. According to Figure 1.1, about 96.3% of participants responded that bettering oneself is either 'somewhat' or 'extremely' important, showing that the majority of the participants were actively striving to achieve self-actualization.

One's relationship with their family also impacts what a person views as important, or successful, in the future. According to Figure 1.4, out of the 87 participants that identified with the "I respect them and they respect me" child-to-parent relationship, only one participant responded that being in a close relationship with family in the future was not 'somewhat' or 'extremely' important. In addition, of the 11 participants that responded with a "strict" parental relationship, only 7 also responded that a close relationship with family in the future is 'somewhat' or 'extremely' important, which is about 63.63% of the participants with "strict" parents (see Figure 1.5).

People who were raised in a "strict" household were four times more likely to view relationship with family as unimportant in the future. The difference in the two populations shows how the two groups grew up under different home cultures and therefore have a different view of success in familial relationships.

Success, present in everyday life, is about reaching goals. Success drives people to set goals and allows them to prioritize. Using these results to learn how to make employees feel more

successful, organizations can spark maximum productivity.

The results were taken from a survey, in which one could choose to be truthful or not. Answers may have not been truthful. The sample size was small and did not have much racial diversity, as the majority of the participants were Caucasian. In order to analyze the perception of success in different cultures, the survey would need to be distributed to a more culturally and socially diverse sample. The survey was too time consuming with 38 questions and therefore, the survey could be improved by shortening the survey. Improvement could also be made by including the ages of the participants in the survey as that was not taken into account for the present survey.

The strengths of the present study were that due to the longer survey, there was more data to analyze and compare. There was a moderate sample size of 136 responses. The survey was left open for about a week, so participants had time to respond to the survey.

Further research and studies should be carried out regarding various items that factor into defining success since the idea of success changes over time. The present study analyzed factors including culture, society, and values. Other aspects that should be researched in the future would be sex, ethnicity, age, and upbringing.

The present study discussed the question of how teenagers perceive success in relation to their values. In the research and previous studies, feelings of success are interpreted as achieving goals and happiness. Feelings of success are not due to social media, money, or fame. From the results of the present survey, and similar to the previous studies and research mentioned earlier, success is perceived based on a person's beliefs and views. The majority of the participants had the same beliefs and viewed success as happiness and achieving goals.

Appendix A

- 1.What is your sex?

a.Maleb.Female
- 2.What ethnicity do you identify with?

a.Caucasianb.Asianc.Europeand.Native Americane.Hispanicf.Other
- 3.What is your gpa?

a.Below 2.0b.2.0-2.5c.2.5-3.0d.3.0-3.5e.3.5-4.0f.4.0+
- 4.How many clubs are you ACTIVELY involved in?

a.0b.1c.2d.3e.4+
- 5.How many sports do you play?

a.0b.1c.2d.3e.4+
- 6.What fine arts activities are you involved in? Check all that apply.

a.Noneb.Bandc.Choird.Orchestrae.Hawkswingf.Theaterg.Art classesh.Other
- 7.How do you view your relationship with your guardian(s)?

a.“I respect them and they respect me”b.Strictc.Food and money providerd.“Eh, they’re family...you gotta love ‘em, but you don’t have to like ‘em”e.Friends

Appendix A(CONTINUED)

- Paint a picture in your mind of a successful person. Make sure this person is not real, but completely imaginary.
- 8.What setting is this person in?

a.Officeb.Homec.Store
- 9.How old is the person?

a.1-18b.19-30c.31-40d.41-50e.51+
- 10.Is this person smart?

a.Yesb.No
- 11.Is this person nice?

a.Yesb.No
- 12.Is this person married/does this person have children?

a.Not married with no childrenb.Married with no childrenc.Not married with childrend.Married with children

- Prioritize the following.
- 1 - not important, 2- moderately unimportant, 3 - somewhat important, and 4 - extremely important
- 13.Getting good grades14.Popularity15.Bettering the community/society16.Setting goals17.Reaching goals18.Having spending money19.Working hard20.Perfection21.Volunteering22.Bettering one’s self23.Independence24.Teamwork25.Overcoming challenges26.Approval from parents/friends/others

- When looking towards the future, how important are these aspects to you?
- 1 - not important, 2 - moderately unimportant, 3 - somewhat important, and 4 - extremely important.
- 27.High income level28.Enjoying your job29.Happiness

Appendix A(Continued)

- 30.Esteemed career/job title
- 31.Having authority
- 32.Close relationship with family
- 33.Marriage
- 34.Having children
- 35.Having hobbies
- 36.Working hard
- 37.Donating to charities/volunteering
- 38.Making an impact in the community/
world

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Motor, Cognitive, and Quality of Life Scores in Parkinson's Patients

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Abstract

It is estimated that 60,000 Americans are diagnosed with Parkinson's disease each year ("What Is Parkinson's Disease?" 1). Additionally, one fourth of all patients with Parkinson's disease reside in North America ("Parkinson disease" 1-12). This project assessed the relationship between Parkinson's disease patients' quality of life, physical declines, and psychological declines associated with disease progression. At the start of the project, quality of life was thought to be related to the motor declines of the patient, but when taking into account other data from the Mattis Dementia Rating Scale and the United Parkinson's Disease Rating Scale, the most significant potential relationships between the variables within these tests were seen to be tenuous. There were, however, a few exceptions: the relationships that could warrant future studies are the relationships between the specific Quality of Life (QoL) scores and the score of "life," and the relationship between specific test variables in the QoL test. Ultimately, it would be helpful in the future to look at the relationship between how the family members see the declines of the patient and how the patients themselves see declines with respect to scores of "money" and "chores." These scores denote how the patient's financial situation is and how well he/she performs chores around the house, respectively. Additionally, it was important to find out the factors leading to the overall self-scores for quality of life. Ultimately, future studies will have to assess the significance of the findings, and will need a more expansive sample of patients.

Introduction

Parkinson's disease is a movement disorder that has both neurological and muscular ramifications. Motor symptoms of Parkinson's disease patients include but are not limited to: Parkinson's gait, rigidity, slowness of movement, and tremors (Defranco 1). This means that patients with Parkinson's disease have positive and negative symptoms; a patient with Parkinson's disease will have symptoms normal controls do not experience (positive symptoms) or lack some ability found in the normal controls (negative symptoms). Normal controls are simply those who do not have a diagnosis of Parkinson's disease.

Beyond the physical declines, patients with Parkinson's disease also experience psycho-

logical declines. The most notable declines are symptoms of depression, anxiety, apathy, and psychosis (Aarsland 2175-2186). This means that the patient with Parkinson's disease can experience psychological effects that are very emotionally distressing. Significantly, these symptoms can have a negative impact on the ability of the patient to perform even the most basic of tasks. This is because the patient's quality of life deteriorates over time with respect to disease progression.

Most of the people that have Parkinson's disease have a later onset of the disease. Such onset denotes the acquiring of the disease after age 50, while early-onset cases are from people that are younger than 50 years old ("Parkinson disease" 1-12). Patients with early-onset experi-

ence a different disease progression and some different symptoms. All patients with Parkinson's disease, however, experience a decline in their motor and psychological functioning with respect to the disease's progression; as the disease progresses, the motor ability of the patient worsens. However, a more specific relationship between these motor scores and the quality of life is not as well-known. It is known, however, that psychological declines, coupled with motor declines, have the ability to make life difficult for the patient and the patient's family.

In addition to psychological declines such as depression, patients with Parkinson's disease can also have cognitive declines like dementia. In fact, dementia, like the other psychological and motor declines, increases as the disease progresses (Aarsland 2175-2186). Due to its high prevalence in Parkinson's disease patients in their later stages of the disease, dementia is a significant symptom related to Parkinson's disease.

Apart from psychological (including dementia) and motor declines, other factors influence a patient's quality of life. Namely, the quality of the patient's marriage, family situation, and several other factors can affect the patient's overall perspective on his life. Just as these factors influence the normal controls, so too do these extra-disease factors—both have a significant impact on the lives of Parkinson's disease patients.

Hypothesis

It was expected in the beginning of the study that the quality of life scores would at least modestly correlate with the motor scores, but the degree of correlation was unknown. It was determined that looking at the relationship between the scores of the patients and the family members was important because the trigger of quality of life degradation was not originally clear; the question was: what would the family members cite as the reason for quality of life degradation? It was also determined that the family of the pa-

tient is the best candidate to assess the quality of life of the patient because they are likely around the patient more than other people, and they may have the ability to discern new symptoms from the patient's normal conditions. Additionally, using family members as an outside rater may be apt because chronic diseases like Parkinson's disease do not affect close relationships the same way as they affect insubstantial relationships (Schrag 1112-1118).

Materials and Methods

This study used archived and de-identified/anonymous data that was used for prior studies on Parkinson's disease. A total of 107 Parkinson's disease observations were employed in the study, as well as a total of 17 normal control observations. The data is from an "observation" and not a test subject, as some of the patients took the tests more than once. Therefore, there were not 124 patients, but 124 observations. Patients from 15 normal control observations and 96 Parkinson's disease observations had a mean age of about 60 (60.400 for normal controls and 60.948 for patients with Parkinson's disease). The average years of education of 15 normal control observations and 98 Parkinson's observations were 15 years (15.27 years for normal controls and 14.95 years for patients with Parkinson's disease). The Mattis Dementia Rating Scale (DRS) is a test to see the changes in cognitive status over time. The average DRS_total scores (showing overall cognitive ability) of 11 normal control's observations and Parkinson's disease observations were seen to be 140.091-138.719 (respectively). This showed that the Parkinson's disease group level of cognitive impairment was comparable to that of the normal controls. The following data table (Graph 1) shows the values for the three variables that were looked at for the different groups.

The similar age, education, and DRS totals of most of the patients signified that the individuals could be accurately compared to each other.

Some patients had performed multiple types of tests or the same test twice. To mitigate the potential detrimental effects of having patients being tested more than once, and to try to gain an accurate description of the disease progression, there was a cutoff period of three months for the dates of examination. This cutoff was put in place because of the fact that, if the patient had taken the same test twice in the period of three months, the patient should not have significant motor or cognitive declines that are different from the examination three months prior. However, the patient's quality of life could change in the period of three months, but it should not be directly related to the disease progression. Declines in the span of three months would rather be attributed to outside—non-disease—factors like that found in the Quality of Life test used in this study. Without a cutoff period, one patient's observations may weigh more heavily on the overall means than another, producing misleading results.

The patients participated in three tests to assess the motor, cognitive, and quality of life declines. The test that was utilized to assess the quality of life of the patients was the Quality of Life in Alzheimer's Disease test (QoL). The United Parkinson's Disease Rating Scale (UPDRS) was used to assess the patient's motor ability, and the Dementia Rating Scale (DRS) was used to assess general cognitive status. These scores were correlated using SPSS software. Correlational and stepwise analyses were used to assess the relevant data. Specifically, the scores given by the family and patient were correlated to assess any relationship between them. The second analysis was a stepwise regression, used to look at the relationship between the variable for the overall quality of life (LIFE) and the other individual QoL test variables. This second analysis looked to find the best predictor of LIFE. The last analysis was done to see the relationship between the DRS, the UPDRS, and the QoL. A correlational analysis was used to look at the relationship between the UPDRS and the DRS, and

the relationship between the individual variables of the QoL test and the UPDRS or DRS. Then, a two-way ANOVA was done to assess the relationship between the aggregate of the UPDRS and the DRS with the s-LIFE score of the QoL.

The QoL test was made of thirteen variables (See Graph 2). The patient and family members had the option of choosing from four descriptions of the patient's condition with respect to a specific test variable. These choices were poor, fair, good, and excellent; poor is the worst evaluation and excellent is the best evaluation. The thirteen variables were as follows: PHY, a variable concerning the patient's physical health; ENERGY, a variable concerning the consistency of patient's energy level; MOOD, a variable concerning the overall mood of the patient; LIVING, a variable concerning the patient's living conditions; MEMORY, a variable concerning the patient's memory; FAMILY, a variable concerning the relationship between the patient and his/her family members; MARR, a variable concerning how well the patient feels his/her marriage is, or how the relationship is between the patient and the person he/she has the closest relationship with; FR, a variable concerning the relationship between the patient and his/her friend(s); SELF, a variable concerning how the patient feels about his/herself; CHORES, a variable concerning the ability of the patient to perform household chores; FUN, a variable concerning the ability of the patient to do activities that are fun; MONEY, a variable concerning the quality of the patient's financial situation; LIFE, a variable concerning the patient's overall rating of his/her life.

Results

The correlation between the self and family scores attempted to address whether the family members and the patients see the progression of disease similarly to each other. After correlating the family-scores and self-scores for the QoL test, it was evident that most of the variables had a high correlation, showing a high re-

lationship. The scores for "chores" and "money" had significant discrepancies between the self and family ratings. The means of the s-CHORES and f-CHORES were 2.778 and 3.074, respectively. Similarly, the means of s-MONEY and f-MONEY were 2.630 and 3.037, respectively. This means that the family members view the patient as having a better quality of life when considering the specific test variables "chores" and "money." While other correlations in this analysis did not show a significant relationship, CHORES and MONEY were outliers. The following data tables show the mean values for the QoL variables and the correlations for the family and self-scores (see Graphs 2 & 3).

(See Graph 4 & 5). The stepwise regression was used in order to see which variables of the QoL were the best predictors of LIFE. The stepwise regression showed that s-LIFE (self-scores for LIFE) was predicted by s-SELF, s-FAMILY, and s-MOOD for the self-scored dataset. For the next stepwise regression, f-MOOD and f-MARR were the best predictors of f-SELF.

The Pearson correlation was used to determine if the DRS and/or the UPDRS were good predictors of the individual variables of the QoL (See Graphs 6 & 7). The Pearson correlation showed that DRS and the UPDRS did not predict the QoL. The only relationship that could have been significant was that the UPDRS was shown to be related to the CHORES and FUN variables. Additionally, this analysis generally showed the expected outcome: that as the patient's cognitive ability declined, the patient also experienced increased motor dysfunction. The secondary analysis the (two-way ANOVA, see Graphs 8 & 9) was not very predictive of the patient's quality of life. This means that the aggregate of the DRS and the UPDRS did not predict the overall quality of life predictor, LIFE. Overall, the DRS did not specifically correlate with any of the variables well, but the UPDRS did correlate with the specific QoL variable for s-FUN.

Discussion

The QoL test indicated that the family members of the patients think of the patients quality of life as better in the domains of carrying out chores and their/the patient's financial situation. There was a possibility that these relationships resulted from a type 1 error, meaning that the results could have been related to having too many analyses, but the results nevertheless showed an area in which the patient and the family member do not agree on the quality of life of the patient. It was interesting that the areas of chores and financial situation were the variables that were significant. This result begs the question: why are these scores significant and why are the other scores so insignificant? These questions should be answered with a different methodology, with different tests, in order to see if the results found here are representative of a real trend in the Parkinson's disease population.

The stepwise regression was significant in its finding that there were three variables in the s-QoL that could predict overall quality of life (s-SELF, s-FAMILY, and s-MOOD; f-MOOD and f-MARR). Another study could look at the relationships between the QoL, or any other measure that looks at daily life and quality of life, and these test variables to see if these three test variables would predict the quality of life in a larger population of patients with Parkinson's disease.

The results were unable to predict who was right in their assessment of the quality of life scores for the CHORES and MONEY domains, but, again, a future study would be able to assess who is right in their assessment. Is the family member right and the patient wrong about his/her symptom changes, or is the patient right and the family member wrong about the reality of the patient's declines? This is the question that will have to be answered in a future study.

Conclusion

This study was limited by the fact that the sample sizes of all of the groups were small. The control group, specifically, was a very small sample group. Additionally, some of the patients

had follow up tests, while other patients had only one test. This limited the diversity of the sample, and meant that the results may not be generalizable to the greater population with Parkinson’s disease.

Ultimately, it would be useful to study the relationship between the patients and family members perceptions of how well the patient performs chores and how his/her financial situation is. This could be proven to be important because the differences could show how the patient erroneously feels his disease is impacting his life, or how the family member does not really know the patient’s real symptoms. Simply put, either the patient or the family member is more right in their respective

characterizations of the scores of the QoL. It would be interesting in a later study to look at the further differences between the two groups.

After the results were found and the trends and relationships were noted, it was determined that the most important findings were that of the correlation between the two different QoL tests (family and patient) and the stepwise analysis. It would be interesting in a future study to find out why the three variables in the stepwise analysis were so related to the s-LIFE variable, and why the two variables in the stepwise analysis were so related to the f-LIFE variable. However, the most important relationship to be assessed in a future study is the relationship between the CHORES and MONEY variables of the QoL.

Graph 1

	FINAL DIAGNOSIS	N	Mean	Std. Deviation	Std. Error Mean
Age	NC	15	60.400	8.5258	2.2013
	PD	96	60.948	9.0732	.9260
Education	NC	15	15.27	2.815	.727
	PD	98	14.95	2.703	.273
DRS _{total}	NC	11	140.091	2.5082	.7562
	PD	64	138.719	4.9392	.6174

Graph 1- a statistical analysis assessing the similarities between normal controls and the Parkinson’s disease group.

Graph 2

Paired Samples Statistics Between Family and Patient QoL Scores					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	S_PHY_H	2.007	27	.0794	.1307
	F_PHY_H	2.704	27	.9121	.1755
Pair 2	S_ENERGY	2.519	27	.6427	.1237
	F_ENERGY	2.370	27	.9260	.1782
Pair 3	S_MOOD	2.923	26	.5602	.1099
	F_MOOD	2.808	26	.8494	.1666
Pair 4	S_LIVING	3.333	27	.6794	.1307
	F_LIVING	3.333	27	.6794	.1307
Pair 5	S_MEMORY	2.407	27	.7473	.1438
	F_MEMORY	2.593	27	.8439	.1624
Pair 6	S_FAMILY	3.346	26	.6895	.1352
	F_FAMILY	3.346	26	.8918	.1749
Pair 7	S_MARR	3.391	23	.7223	.1500
	F_MARR	3.391	23	.0913	.1059
Pair 8	S_FR	3.259	27	.6559	.1262
	F_FR	3.259	27	.7642	.1471
Pair 9	S_SELF	2.962	26	.5987	.1174
	F_SELF	3.038	26	.7200	.1412
Pair 10	S_CHORES	2.778	27	.8916	.1716
	F_CHORES	3.074	27	.8738	.1682
Pair 11	S_FUN	2.778	27	.7511	.1445
	F_FUN	2.963	27	.8979	.1728
Pair 12	S_MONEY	2.630	27	.7917	.1524
	F_MONEY	3.037	27	.7061	.1359
Pair 13	S_LIFE	3.000	27	.6202	.1194
	F_LIFE	3.111	27	.7511	.1445

Graph 2- a collection of the mean scores of the participants and their family members.

Graph 3

		N	Correlation	Sig.
Pair 1	S_PHY_H & F_PHY_H	27	.766	.000
Pair 2	S_ENERGY & F_ENERGY	27	.505	.007
Pair 3	S_MOOD & F_MOOD	26	.388	.050
Pair 4	S_LIVING & F_LIVING	27	.167	.406
Pair 5	S_MEMORY & F_MEMORY	27	.517	.006
Pair 6	S_FAMILY & F_FAMILY	26	.318	.114
Pair 7	S_MARR & F_MARR	23	.740	.000
Pair 8	S_FR & F_FR	27	.091	.652
Pair 9	S_SELF & F_SELF	26	.375	.059
Pair 10	S_CHORES & F_CHORES	27	.664	.000
Pair 11	S_FUN & F_FUN	27	.330	.093
Pair 12	S_MONEY & F_MONEY	27	.369	.058
Pair 13	S_LIFE & F_LIFE	27	.413	.032

Graph 3-A correlational analysis between the scores of the patient and his/her family member from the QoL

Graph 4

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.910	.327		2.785	.010		
	F_MOOD	.787	.116	.804	6.762	.000	1.000	1.000
2	(Constant)	.528	.324		1.627	.117		
	F_MOOD	.454	.161	.464	2.823	.009	.417	2.396
	F_MARR	.389	.144	.445	2.708	.012	.417	2.396
3	(Constant)	.150	.332		.452	.655		
	F_MOOD	.279	.162	.285	1.718	.099	.338	2.961
	F_MARR	.400	.130	.458	3.066	.005	.417	2.399
	F_CHORES	.262	.106	.292	2.470	.021	.664	1.506

Graph 4- a stepwise analysis between individual scores of the patient’s QoL scores and Patient’s score for their overall quality of life (s-LIFE).

Graph 5

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.910	.327		2.785	.010		
	F_MOOD	.787	.116	.804	6.762	.000	1.000	1.000
2	(Constant)	.528	.324		1.627	.117		
	F_MOOD	.454	.161	.464	2.823	.009	.417	2.396
	F_MARR	.389	.144	.445	2.708	.012	.417	2.396
3	(Constant)	.150	.332		.452	.655		
	F_MOOD	.279	.162	.285	1.718	.099	.338	2.961
	F_MARR	.400	.130	.458	3.066	.005	.417	2.399
	F_CHORES	.262	.106	.292	2.470	.021	.664	1.506

Graph 5- a stepwise analysis between individual scores of the family’s QoL scores and family’s score for the overall quality of life (f-LIFE).

Graph 6

Correlation of the DRS, the UPDRS and QoL variables			
		DRS_Total	UPDRS
DRS_Total	Pearson Correlation	1	-.502**
	Sig. (2-tailed)		.009
	N	64	57
UPDRS	Pearson Correlation	-.502**	1
	Sig. (2-tailed)	.009	
	N	57	76
S_PHY_H	Pearson Correlation	.167	-.207
	Sig. (2-tailed)	.198	.121
	N	49	57
S_ENERGY	Pearson Correlation	.086	-.219
	Sig. (2-tailed)	.658	.101
	N	49	57
S_MOOD	Pearson Correlation	.169	-.099
	Sig. (2-tailed)	.247	.466
	N	49	57
S_LIVING	Pearson Correlation	.156	-.182
	Sig. (2-tailed)	.286	.176
	N	49	57
S_MEMORY	Pearson Correlation	.110	-.131
	Sig. (2-tailed)	.454	.331
	N	49	57
S_FAMILY	Pearson Correlation	.328	-.166
	Sig. (2-tailed)	.115	.216
	N	49	57
S_MARR	Pearson Correlation	.028	-.027

S_FR	Pearson Correlation	.216	-.200
	Sig. (2-tailed)	.136	.136
	N	49	57
S_SELF	Pearson Correlation	.104	-.200
	Sig. (2-tailed)	.481	.139
	N	48	56
S_CHORES	Pearson Correlation	.260	-.234
	Sig. (2-tailed)	.071	.080
	N	49	57
S_FUN	Pearson Correlation	.162	-.463**
	Sig. (2-tailed)	.267	.000
	N	49	57
S_MONEY	Pearson Correlation	.208	-.117
	Sig. (2-tailed)	.152	.368
	N	49	57
S_LIFE	Pearson Correlation	.195	-.138
	Sig. (2-tailed)	.179	.307
	N	49	57

Graph 6- a correlational analysis between the individual values of the s-QoL, the DRS, and the UPDRS.

Graph 7

Correlations			
		DRS_total	UPDRS
DRS_total	Pearson Correlation	1	-.502*
	Sig. (2-tailed)		.000
	N	64	57
UPDRS	Pearson Correlation	-.502*	1
	Sig. (2-tailed)	.000	
	N	57	76
F_PHY_H	Pearson Correlation	.456*	-.275
	Sig. (2-tailed)	.050	.184
	N	19	25
F_ENERGY	Pearson Correlation	.300	-.077
	Sig. (2-tailed)	.211	.715
	N	19	25
F_MOOD	Pearson Correlation	.065	.061
	Sig. (2-tailed)	.792	.778
	N	19	24
F_LIVING	Pearson Correlation	-.072	.190
	Sig. (2-tailed)	.768	.363
	N	19	25
F_MEMORY	Pearson Correlation	.177	.298
	Sig. (2-tailed)	.470	.149
	N	19	25
F_FAMILY	Pearson Correlation	.298	.017
	Sig. (2-tailed)	.230	.935
	N	18	24
F_MARR	Pearson Correlation	.492	-.017
	Sig. (2-tailed)	.063	.941
	N	15	21
F_FR	Pearson Correlation	.035	.122
	Sig. (2-tailed)	.874	.563
	N	19	25
F_SELF	Pearson Correlation	.150	.164
	Sig. (2-tailed)	.540	.435
	N	19	25
F_CHORES	Pearson Correlation	.510*	-.339
	Sig. (2-tailed)	.026	.097
	N	19	25
F_FUN	Pearson Correlation	.476*	-.230
	Sig. (2-tailed)	.035	.268
	N	19	25
F_MONEY	Pearson Correlation	.432	.041
	Sig. (2-tailed)	.065	.846
	N	19	25
F_LIFE	Pearson Correlation	.304	-.051
	Sig. (2-tailed)	.206	.809
	N	19	25

Graph 7- a correlational analysis between the individual values of the f-QoL, the DRS, and the UPDRS.

Graph 8

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.089	2	.044	.125	.884 ^a
	Residual	4.970	14	.355		
	Total	5.059	16			

a. Dependent Variable: S_LIFE
b. Predictors: (Constant), UPDRS, DRS_total

Graph 8- a two-way ANOVA analysis for the s-QoL, the UPDRS, and the DRS.

Graph 9

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.241	2	.621	1.504	.234 ^a
	Residual	17.336	42	.413		
	Total	18.578	44			

a. Dependent Variable: F_LIFE
b. Predictors: (Constant), UPDRS, DRS_total

Graph 9- a two way ANOVA analysis for the f-QoL, the UPDRS, and the DRS.

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The Effect of Paper Color on Test Performance

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Abstract

The experiment aimed to test the effect of paper color on students' test performance. Researchers printed the same test with math and reading sections on paper in three different colors: red, white, and blue. Researchers asked 60 high school seniors to take the test. The result showed that students had the best performance with blue test paper and the worst with red test paper. This conclusion suggests that the color of the test paper does have an impact on performance, a factor which is commonly overlooked by teachers. This finding can help schools regulate testing rules, and lead to a fairer study environment.

Introduction

The effect of color on human behavior has frequently been evaluated in psychological studies, with explorations ranging from color's influence on human emotions to its impact on students' test performance. Students sit through many tests in school, and their performance on those tests may be affected by other factors besides their intelligence and level of preparation, such as the color of test papers. Many educators and students themselves hardly notice that this factor can influence their test scores.

Tal and Aker's study on the effect of paper color (2008) suggested that many teachers in high school use test papers in various colors to avoid cheating. They found that the color blue may impose negative influence on students' test performance. In contrast, pastel colors may not have such a strong negative influence. However, ten years prior to Tal and Aker's research, a study found that compared to red test papers, blue test papers were more likely to generate superior test performance, especially on tests with difficult questions (Sinclair, Soldat, & Mark, 1998).

Another study in 2007 elaborated on how the color red can affect people's performance

by introducing red's positive effect as a uniform color on sports field and its detrimental impact related to grading. According to this study, many teachers had started to use purple pens instead of red pens to reduce the signal of "harshness" (Clary, Wandersee, & Elias, 2007). This study focused on how the color red can generate anxiety that later affects student's performance.

Many past studies have addressed the importance of color's effect on tests, and many schools have reacted positively to those conclusions; however, there are barely any studies specifically conducted on high school students recently. The purpose of this study was to examine the relationship between test paper color and student's performance, and to confirm or reject the results of studies conducted before. The hypothesis is that students with blue test paper perform the best on the test, students with white test paper perform at medium level, and students with red test paper perform the worst.

Method

Participants: Participants in this study were randomly chosen from 100 seniors at Beijing

No.4 High School International Campus, a sector of a prestigious Chinese high school where most graduates attend U.S. universities. These participants formed a convenience sample. The sample size was 60 people, with 20 randomly assigned into each color group. All participants had similar academic abilities, and both sexes were equally considered. Informed consent was obtained before the test was given out.

Design and Procedure

The study used survey data and the color of test papers as its variables. First, the researchers designed the test, which included a math section and a reading section (Appendix A). The first three questions in the math section were basic calculations of three-digit numbers. The following three questions in the math section were number sequences that required filling out. Questions in the reading section were chosen from a former TOEFL reading test, and the questions tested both vocabulary and information retrieving skill. Both math and reading

sections included basic questions and more difficult ones, which could cater to the participants' varying academic abilities. The math section included six questions while the reading section included four. Each question was counted as one point, with a total score of 10. Researchers then printed the test on red, blue, and white paper, each with 20 copies. Colored test papers were piled randomly, with no same color next to each other. Each participant took a test paper from the top. Instead of directly comparing students' performance on blue and red test papers, researchers added an extra group of participants with white test papers. This was intended to simulate a group that faces a situation closest to an ordinary test, a control group, since a large portion of the student population normally takes tests on white test papers.

No time limit was imposed and all test papers were collected after students finished. Three scores were calculated for each test: one for math section only, one for reading section only, and one total score.

Results

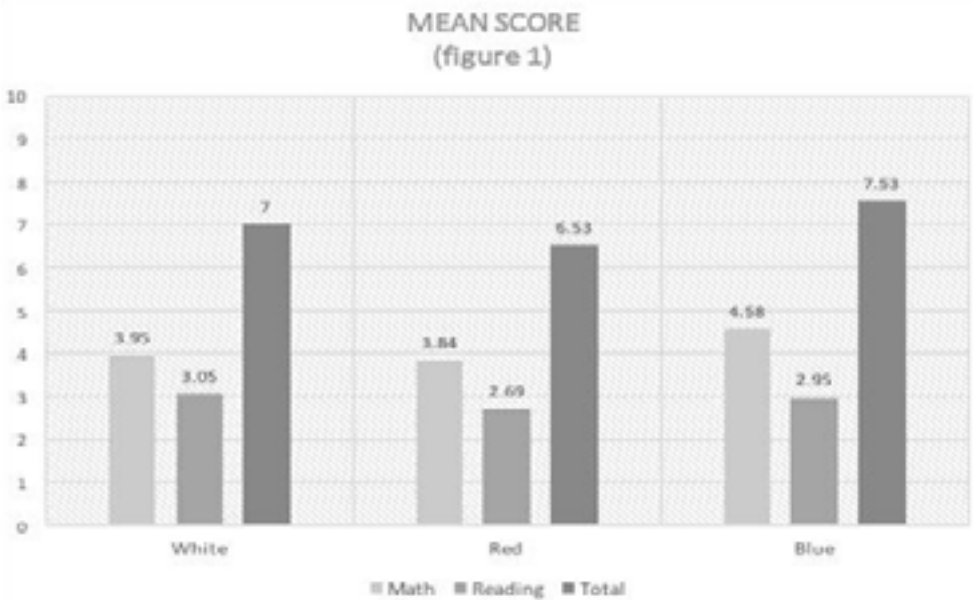


Figure 1 shows the mean score of each section in each color group. In this figure, the participants who took the test on blue paper achieved the highest mean overall score of 7.53, while participants with white test paper achieved a mean overall score of 7, and participants with red paper achieved the least overall score of 6.53. Participants with blue test paper did the best in the math section with a mean score of 4.58, and participants with white test paper attained the highest reading score of 3.95. While the range of mean math scores is only 0.63, the range of mean readings scores is 1.

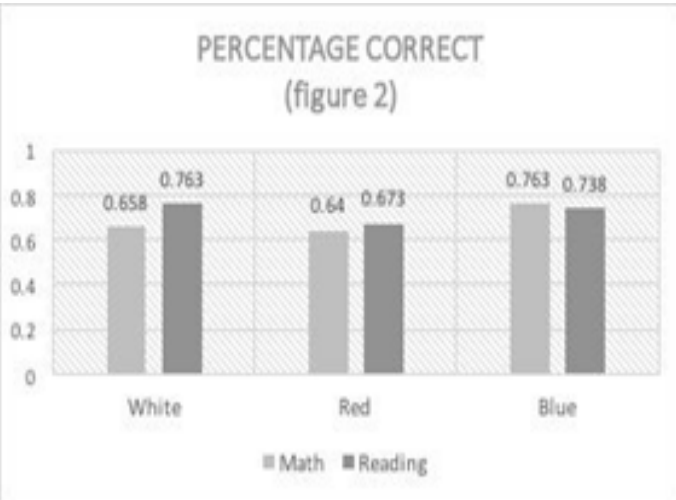


Figure 2 shows the mean percentage of correct answers in each section with different colors of test paper. While participants with red and blue test papers both had small difference in mean sectional percentages of correct answers, participants with white test paper had a bigger difference in these two percentages. Participants with blue test paper had on average higher percentage of math questions correct, whereas for participants with white and red test paper, they had on average higher percentage of reading questions correct.

Discussion

The results show that participants with blue test paper scored on average the highest, participants with white test paper scored on average the second highest, and participants with red test paper scored the least. The result parallels many experiments conducted by other researchers before that have concluded that blue has a positive effect on test performance, while red has a negative effect. In debriefing the participants, many of those with red test papers reported that the color was too bright and annoying, and similar conclusions can be found in past studies that mentioned red as a color that increases anxiety.

Though the experiment matched the hypothesis, there are some confounding variables that may have affected the final result. First, participants were familiar with each other, so when researchers handed out all one test paper, some participants may have gathered and discussed, which could influence the result by scoring higher. Second, participants finished the test in different environments; while some finished the test in a quiet classroom, others finished it when people nearby were talking loudly, creating noise. A distracting environment may lead to more wrong answers. Moreover, since the test was not formal and no reward was given, some participants lacked strong incentives to take the

test seriously as they would do in other exams. To avoid such confounding variables, researchers can gather all participants in a quiet classroom and distribute all the test papers at the same time, then collect the test papers together after they finish, as teachers do in normal exams. Also, rewards like a coupon for the school café can be given out to engage participants and provide incentive.

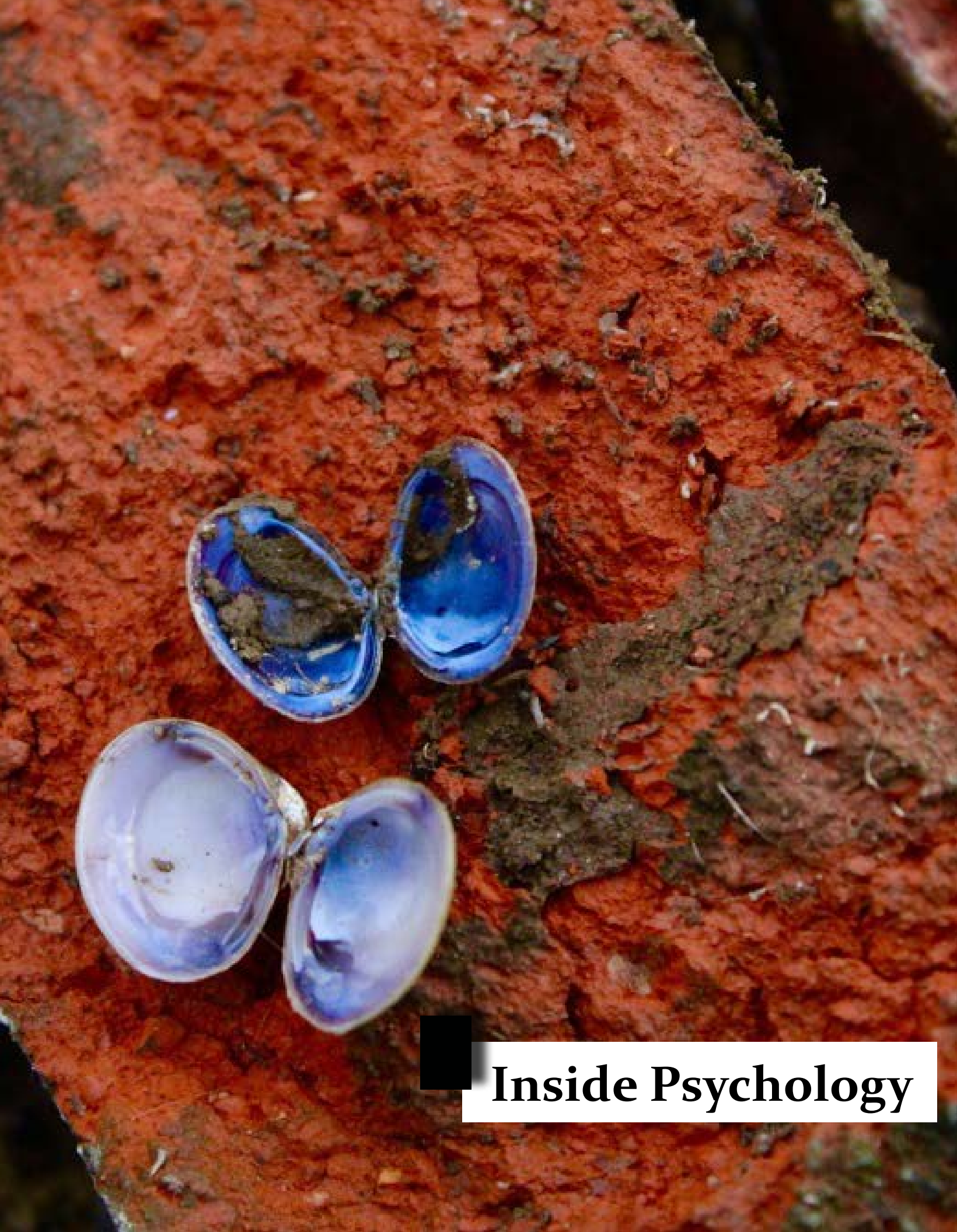
Future studies can, and should, be conducted to gather deeper reasons as to why and how colors can affect test performance to evaluate how to generate the best outcome in exams for students and educators alike.

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Inside Psychology

The Interaction of Nature and Nurture through Epigenetic Modifications on DNA Among Different Ethnicities

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Abstract

Epigenetics is an emerging field of science that is closely tied to the interaction between nature and nurture. The extent to which a trait is influenced by nature or nurture can be measured with twin and adoption studies. For example, although schizophrenia is highly hereditary, identical twins (who have the exact same DNA code) may not both necessarily have schizophrenia. This can be explained by the idea that although genetics determines one’s risk and predisposition for certain traits or diseases (like schizophrenia), healthy environments and experiences can lower the risk, while unhealthy environments and experiences can raise the risk, possibly crossing the threshold for disease. Certain traits are found more prevalently within specific demographics. While this has been previously attributed to a single demographic sharing a similar genetic code, it’s been discovered that the shared experiences and culture of a demographic has more of an effect on its shared phenotype than previously thought. This paper aims to evaluate the interaction between ethnicity, nature, and nurture.

Introduction: Gene Expression and the Role of Epigenetics

When a protein is needed, genetic information flows from DNA to mRNA to be transcribed into the desired protein product. Protein creation is not an erratic process; copies of mRNA are only present when they are needed to translate its corresponding protein. In fact, the rate of transcription of your neurotransmitters is currently changing to account for the reading of this sentence. Because mRNA only exists for a few minutes and then no longer translates into protein, changes in the rate of protein transcription from mRNA are used to control the rate at which genes produce proteins, which is called gene expression (Plomin et. al, 2014).

In modern years, the field of epigenetics has grown rapidly. Epigenetics is focused on under-

standing developmental changes in gene expression that do not alter the actual coding on the sequence of a gene but can be passed on from a cell to its daughter cells. Epigenetic marks can “turn on” and “turn off” an individual’s genes—in effect allowing or inhibiting their expression—through DNA methylation, the attachment of a carbon, and are often caused by environmental stressors.

These molecular annotations of the genetic code have a unique position between genetic ancestry and environmental influence. Unlike the rest of the genome, which is only inherited from an individual’s parents (with random mutations here and there), methylation and other epigenetic annotations can be modified based on experience. These modifications influence when and where particular genes are expressed and appear to have significant impacts on disease risk,

suggesting explanations for how environmental factors, such as maternal smoking during pregnancy, can influence a child’s risk of later health problems (Plomin et. al, 2014).

Description of Past Studies

A study analyzed blood, saliva, and brain samples from seven different racial/ethnic groups to assess the intrinsic epigenetic age acceleration of blood (independent of blood cell counts) and the extrinsic epigenetic aging rates of blood (dependent on blood cell counts and tracks the age of the immune system) (Horvath, 2016). The resulting trends between ethnicity and aging/mortality revealed that epigenetic aging rates are significantly associated with sex and race/ethnicity (Horvath, 2016).

However, epigenetic differences in the genome are not only a reflection of common genetic ancestry but also appear to reflect an ethnic group’s shared culture and environment, report scientists that studied epigenetic signatures in 573 children of self-identified Mexican or Puerto-Rican identity drawn from the GALA II study, a cohort previously developed to study environmental and genetic components of asthma risk in Latino children. (“Cultural Differences,” 2017). They identified 916 methylation sites that varied with ethnic identity but found that only 520 of these differences could be completely explained by genetic ancestry—109 could be partially explained by ancestry, while 205 could not be explained by ancestry at all (Galanter et. al, 2017).

The researchers found that many of these additional methylation sites corresponded to sites that previous studies had shown to be sensitive to environmental and social factors such as maternal smoking, exposure to diesel exhaust, and psychosocial stress (Galanter et. al, 2017). Thus, the rest of the epigenetic differences may reflect a biological stamp made by the different experiences, practices, and environmental exposures distinct to the two ethnic subgroups.

Evaluation

Researchers and clinicians have known for many years that different racial and ethnic populations get diseases at different rates, respond differently to medications, and show very different results on standard clinical tests. For a range of medical tests, whether one’s physician is told that his/her patient’s lab result is normal or abnormal depends entirely on the race/ethnicity box that the patient ticks on an intake form (Bolnick, 2015).

Scientists and clinicians have increasingly tried to move away from simplistic racial and ethnic categories in disease research—with the rise of precision medicine—in clinical diagnosis and treatment as well (Bolnick, 2015). Studies by the Burchard group and others have found that using genetic ancestry rather than ethnic self-identification significantly improves diagnostic accuracy for certain diseases (“Cultural Differences,” 2017).

But the new data showing that a large fraction of epigenetic signatures of ethnicity reflect something other than ancestry suggests that abandoning the idea of race and ethnicity altogether could sacrifice a lot of valuable information. By looking into race and ethnicity as significant influencers of the epigenome, people can learn more about the drivers of differences in health and disease between different communities. It’s tempting to assume that such health disparities between races and ethnicities all stem from inherited genetic differences, but that’s not necessarily the case. Different racial and ethnic groups also eat different diets, live in neighborhoods with more or less pollution, experience different levels of poverty, and are more or less likely to smoke tobacco, all of which could also impact their health outcomes (Wade, 2007).

Like a standard family history, ethnicity is associated with disease for both genetic and environmental reasons. Part of that is genetic, but part of it is that a person’s lifestyle is influenced

heavily by his/her parents’ lifestyle. A person’s ethnic group is like a much bigger family—it’s partly a matter of genetics, but it also reflects the environment of his/her broader community.

Implications

This information suggests that using epigenetics as a biomarker could provide a lot of information about environmental exposures within particular populations that’s not captured by genetics. Researchers should conduct studies to understand how specific epigenetic signatures are linked to particular environmental exposures, and use those signals to understand patient risk.

The findings provide a counterpoint to long-standing efforts in the biomedical research

community to replace imprecise racial and ethnic categorization with genetic tests to determine ancestry (“Cultural Differences,” 2017). The discovery could help scientists understand how social, cultural, and environmental factors interact with genetics to create differences in health outcomes between different ethnic populations.

Medical education would benefit greatly by incorporating anthropological and genetic perspectives on the complexities of race, human genetic variation, epigenetics, and the causes of racial/ethnic disparities (Bolnick, 2015). Medical students and practicing physicians should also receive training on how to use this knowledge to improve clinical practice, diagnosis, and treatment for racially diverse populations (Bolnick, 2015).

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Socially Assistive Robots: A New Treatment Tool for Social Anxiety Disorder?

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Abstract

Social anxiety disorder is one of the most common mental disorders nationwide, and characterized by fear and avoidance of social interactions, as such situations may result in embarrassment or negative judgment. While it’s difficult to determine the exact causes of Social Anxiety Disorder, a number of effective treatments are available including cognitive behavioral therapy, exposure therapy, and social skills training. In other disorders relating to difficulties in social interaction, such as Autism Spectrum Disorder, methods of social skills training with social robots have been introduced. This paper explores the possibilities for using social robots as a supplemental treatment tool for Social Anxiety Disorder.

Discussion

Social Anxiety Disorder, also known as social phobia, is the third most common mental disorder in the United States with 5-12% of the general population experiencing it during their lifetime (Rapee & Spence, 2004). Social phobia can begin as early as preschool but typically starts in adolescence, in part due to increased social stressors during this developmental stage (Rapee & Spence, 2004). People with Social Anxiety Disorder frequently feel anxious and likely avoid everyday social interactions in fear of being negatively judged by others (Boer, 1997) to the point where it severely limits many aspects of life and can lead to other mental illnesses—an extremity that differentiates it from ordinary shyness (Schneier, 2006).

As daily life typically requires a significant amount of social interaction, the consequences of social phobia are detrimental to one’s routine, well-being, and functioning as a productive member of society. While individuals with so-

cial phobia will especially avoid social situations (public speaking, performing on stage, and talking to strangers) and interactions with people in authority (such as employers, professors, or doctors), anxiety felt through fear and dread could result from any situation where the individual might feel judgment (Schneier, 2006). People with social phobia who are exposed to these feared social situations may experience physical symptoms such as heart palpitations, dry mouth, tremors, sweating, gastrointestinal discomfort, diarrhea, muscle tension or trembling, a shaky voice, blushing, and confusion (Den Boer, 1997).

The cause of social phobia is unclear, but it appears to include both genetic and psychological factors. A humiliating experience from childhood, extreme shyness and stress as a child, and overbearing parenting may all contribute to the developing social phobia (Boer, 1997; Schneier, 2006).

Treatment

Social anxiety disorder is difficult to detect or acknowledge, and few individuals with social phobia seek treatment (Stein, Torgrud, & Walker, 2000). In fact, many individuals live with social phobia for ten years or more before seeking treatment (Schneier, 2006). While there is a higher percentage of women who experience the condition, more men tend to seek treatment (Rappee & Spence, 2004). If treatment is not sought, additional psychological, emotional, and financial hardships may develop due to social isolation and unemployment (Curtis, Kimball, & Strop, 2004). Children with social phobia who do not seek treatment may experience short and long-term effects possibly including a drop in grades, an increase in drug and alcohol abuse, and fewer social and romantic relationships (Schneier, 2006; Buckner, Schmidt, Lang, Small, Schlauch, & Lewinsohn, 2008). It is therefore crucial for individuals living with social anxiety disorder to seek treatment, as cases that go undetected could lead to the disorder becoming more severe and the manifestation of additional risk factors.

The most common treatment for social phobia is cognitive behavioral therapy (CBT). The goal of CBT is to reduce the prevalences of symptoms experienced during stress-inducing social situations by replacing patterns of negative thinking with coping and emotion regulation strategies (Schneier, 2006). CBT is an evidence-based treatment that allows the individual to identify and practice effective strategies for avoiding harmful thoughts and behaviors (Schneier, 2006). There are several other different types of therapy, such as exposure therapy, in which patients are prompted to imagine their most feared situation until they do not feel frightened when confronting the situation in real life (Schneier, 2006). Training to develop social interaction skills is also used by practicing real-life situations. Role playing is often in-

tegrated into social skills training, which allows the individual to practice playing out the feared situation in a controlled and safe environment. In theory after practicing this feared situation a number of times, the individual will be more prepared to face real life (Schneier, 2006).

Robots as an Intervention Tool

Socially Assistive Robotics (SAR) are robots that interact socially with individuals in order to “enhance the quality of life” of individuals with social disorders by helping them “with special needs in their everyday activities” (Tapus, Mataric, & Scassellati, 2007). While the use of social robots is not common among students with social anxiety disorder, robots have been used to facilitate social skills training in similar populations.

Social robots have been used to assist students on the autism spectrum, encouraging kids to engage in eye contact, teaching social norms, and creating awareness of others’ and their own emotional states (Robins, Dautenhahn, Boekhorst, & Billard, 2005). While there are differences between autism and social anxiety disorder, both populations prefer predictability and require a safe space to practice social skills. Social robots can play significant roles in treating youth with social anxiety disorder. For example, they can provide emotion regulation education, role play, and coach patients through feared tasks as many times as the child needs, as well as track and monitor treatment progress (Rabbitt, Kazdin, & Scassellati, 2014).

Different kinds of robots have varying physical characteristics—they can be furry and cute like MIT Media Lab’s Dragonbot or appear small and human-like, similar to the Nao robot. The robot chosen depends on the age of the child interacting with it, what kind of task it will be programmed to do, and what physical capabilities it requires to perform the task. In many reported cases, robots are useful with socially impaired youth since the robot’s behaviors are typically

simple and repetitive, and the robot’s appearance is appealing and non-threatening (Cabibihan, Javed, Ang, & Aljunied, 2013). The robots can also have a camera or sensors embedded into them that can help the robot understand the user’s feelings. This allows the robot to respond to the user with encouragement or change its behavior to benefit the child (Cabibihan, Javed, Ang, & Aljunied, 2013). The data recorded of the user can be stored within the robot and used to track progress and provide more personalized feedback.

Social robots can act as complementary tools to therapists for treating social phobia by being predictable, patient, non-judgmental, and capable of playing various roles in which the patient could practice various fearful scenarios. Students might especially feel more emotional attachment to the robots by regarding them as friends or peers.

Moreover, robots are able to store data and track student progress more accurately than a human might. The software built into the robot would track, process, and store data collected during interactions, including a patient’s facial expressions, body motions, and tone of voice and then compare their improvement made throughout the subsequent sessions. Robots are efficient and patient and would not only keep immaculate progress records for which therapists would access and assess, but the robot could also be programmed to provide feedback to the patient. Individuals often find robots less threatening and judgmental than humans which may lead to more reliable responses from children, and the children may even accept constructive feedback from robots more readily than humans.

In addition, the introduction of a social robot has shown to be appropriate in preparing a patient for real-life social situations, as well as facilitating social opportunities. For example, one case studied how a small, human-like social robot served as the center of attention for pairs of two students. Since both students wanted to play or interact with the robot, the children had

to interact with each other. The robot provided an opportunity for the students to engage with one another as they had to acknowledge each other during their close interaction with the robot. The study showed that the robot acted as a facilitator between the children, highlighting that social robots is an appropriate tool for treatment (Robins, Dautenhahn, Boekhorst, & Billard, 2005). In another example, a robot dinosaur was used to help autistic children learn to interact socially first with the robot, and then eventually with other people. The study showed that the dinosaur robot did help children exhibit better social behavior with other humans in later interactions (Kim, Berkovits, Bernier, Leyzberg, Shic, Paul, & Scassellati, 2013).

Conclusion

Social anxiety disorder is a debilitating disorder that often begins in youth and can worsen into adulthood if gone untreated. While there are a number of available and effective treatments currently being used, social robots should also be recommended as a treatment option because it could enhance and complement current efforts. Although studies have only tested social robots in specific populations, like autism, research indicates their effectiveness in social skills training could be applied to other populations as well. We recommend that social robots be used in pilot studies with youth suffering from social anxiety disorder as a way for students to learn from peer-like and non-threatening technology that can track progress over time, respond to how the user is feeling, and be an engaging tool that will help these youth overcome their greatest fears.

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The Psychological Effects of Solitary Confinement as Punishment

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Abstract

While the isolation of inmates is incredibly prevalent in the current United States penitentiary system and subject to much controversy, the actual psychological effects of solitary confinements on inmates is less documented. The authors of the following review aim to summarize the history of solitary confinement and its development into the practice’s current state, as well as our understanding of the psychological effects this isolation has on the brain.

Introduction

The present review addresses solitary confinement and its detrimental effects on the human brain. Solitary confinement is used in most penitentiary institutions though is rarely referred to as such. Depending on the state or country, solitary confinement may be labeled as “segregation,” “restrictive housing,” “Special Housing Units,” “Restricted Housing Units,” or “Communication Management Units,” among other titles. Yet regardless of its name, prisoners in solitary confinement are subjected to similar conditions. The following paper will review these conditions and how they impact the prisoners’ mental health, physical well being and their prospects for a successful return to society.

Solitary confinement consists of isolating a prisoner from the general population and placing him or her in an empty cell. Inmates spend 22-24 hours in this cell, confined by a solid steel door and subjected to virtually no human contact. Their interactions with guards are typically their only form of communication with another human being. Excluding one hour of exercise a day, inmates are locked in cells that are approximately 80 square feet, smaller

than the typical horse stable (Childress, 2013).

There are two types of solitary confinement commonly used today: disciplinary and administrative segregation (Weir, 2012). Disciplinary segregation is used when inmates break the prison’s rules. The infraction can range in severity from theft to assault but is punishable by the same fate. Disciplinarily segregated prisoners are separated from other inmates for a specified amount of time. Under administrative segregation, prisoners are isolated if they are deemed a risk to the safety of other inmates or guards. In these cases, prisoners may be in solitary confinement for months or years with no set duration.

History of Solitary Confinement

Typical forms of criminal punishment have changed dramatically throughout history. Before prisons were established, the price for committing a serious crime was death—typically a hanging in front of an angry crowd. However, as time went on, leaders decided that a more civilized approach was in order. The “birthplace of the modern prison system” is considered to be Walnut Street Jail, in Philadelphia. Established by Quakers in 1773 (and expanded later in 1790),

it was the first institution in the United States to not only punish criminals, but attempt to rehabilitate them as well (Biggs, 2017). Two more establishments, including Auburn Prison and Newgate Prison, opened soon after. All three began as centers for torture that were unsuccessful in rehabilitating the delinquents as they had allegedly set out to do (Biggs, 2017). Prisoners spent their entire sentences—often multiple years—in isolation, only occasionally being allowed to communicate with guards and priests. As the Walnut Street Jail was able to achieve the majority of its intended aims, the Quakers and Anglicans established a new institution called Eastern State Penitentiary. They believed that isolation would give the prisoner an opportunity to feel penitence, or remorse; the origin of the word “penitentiary” to describe a prison originates from.

In the late 19th century, the Supreme Court began exploring evidence from Europe about the negative effects of social isolation. Doctors in Germany “documented a spike in psychosis among the incarcerated” (Sadowski, 2016). In 1890, the Supreme Court condemned extended social isolation in prisons because “a considerable number of prisoners...fell into a semi-fatuous condition...and others became violently insane” (Sadowski, 2016).

Though Eastern State Penitentiary was entirely abandoned in 1971, the concept of total isolation appealed to those more interested in inflicting pain without rehabilitation. For this reason, in the 20th century, solitary confinement became a “purely punitive tool used to break the spirits of inmates considered disruptive, violent, or disobedient” (Biggs, 2017). In the past 25 years, these punishment tactics that seemed to have been controlled have increased in popularity in the prison systems. It is argued that “almost all maximum-security prisoners in America are kept in a kind of solitary for a large portion of their sentences” (Biggs, 2017). These institutions, consisting of “supermax” and “control unit” prisons, have prompted the implementa-

tion of “security housing units” where criminals are kept alone in a cell for a majority of the day.

Effects of Isolation

While the United States has more and more inmates in isolation each year, there are few accounts of these prisoners’ states of well-being in solitary confinement. Within the estimated 80,000 prisoners subjected to isolation today, the Government Accountability Office (GAO) reports the number of isolated inmates in federal prisons as approximately 12,460. Since 2008, the total number of prisoners in solitary confinement in U.S. federal prisons has grown significantly faster than the general population growth, according to the GAO report (United, 2013). Yet even with the spike in usage, the GAO points out that still the Bureau of Prisons (BOP) provides no data on how isolation impacts the inmates, how the inmates are actually treated in solitary (there are countless accusations across the country of prisoner violations while in segregation), and whether the practice even works. Similarly to how the BOP is yet to compile data on its isolation usage, there is not extensive research on inmates in solitary confinement. For this reason, it is difficult to consider exactly the effects of isolation on these prisoners. Still, experts refer to studies determining the effect of isolation on different populations, such as rats and college students. But such studies on humans are rare, as most major research institutions deem them inhumane. Studies on animals are conducted but still heavily regulated as extended isolation in animal experiments are considered cruel.

One such study, by Michael J. Zigmond of the University of Pittsburgh, had to obtain special permission to subject mice to “shoebox housing” (Weir, 2012). The study included the experimental group of mice housed in the shoebox, and a control group that was designed as an “enriched environment” compared to its counterpart. The mice in the control group were able

to interact with others, move around more freely and had access to exercise equipment. Zigmond described the settings as reflective of the conditions in solitary confinement compared to the general population. The study found that the isolated mice had simpler neurons, fewer connections between those neurons, and fewer synapses in the brain compared to the socialized mice. This is particularly significant since, as Dr. Huda Akil, professor of neurosciences at the University of Michigan, puts it, “the brain is comprised of 100 billion cells, 500 trillion connections. It is an organ of social function; the brain needs to interact in the world” (Weir, 2012).

Of the few studies conducted on human subjects, neuropsychologist Donald O’Hebb’s experiment in the early 1950s are especially notable. Hebb confined McGill University college students to isolation units. In order to reduce stimuli, students wore ear pillows to muffle their hearing and plastic visors to restrict their sight. Within 25 hours, the students couldn’t think or concentrate, and they reported overwhelming hallucinations, including strange visions of rocks, eyeglasses, and babies; sensations that their skin crawled; hearing “full stereophonic sound” in their ears; and spatial disorientation whenever they left their cell (Ravindran, 2017). The extreme effects of this simulation caused O’Hebb to later publicly regret subjecting participants to these arguably inhumane conditions, but the study remains one of the only experimental studies on the real-time effect of complete isolation on the subject’s psychological state. In other similar studies where subjects were restricted to minimal stimuli, symptoms of perceptual distortions and illusions, impaired cognition, motor restlessness, significant anxiety and aggressive fantasies, were among the effects. EEG recordings confirmed abnormalities typical of stupor and delirium. (Brownfield, 1965).

Additionally, the experience of solitary confinement has been associated with the development of PTSD in prisoners. In 2017, a study of a cohort of 119 recently released prisoners ac-

cessing primary medical care found that those who self-reported placement in solitary confinement were 27% more likely to screen positively for PTSD than those who did not (Hagan, 2017).

These types of psychological harm can affect any prisoner placed in solitary, with the extent and severity of the trauma dependent on the individual and the specific duration and conditions of solitude. Treating and mitigating this trauma can be difficult for mental health professionals while the person in question is actively in a segregation unit, where mental health services are typically limited to medication and occasional meetings in private. Individual or group therapy and structured interventions that would usually be a resource are not typically available because of the inherent limitations of their incarceration (Metzner and Fellner, 2017). Thus, the most effective treatments for the trauma that these patients endure as a result of their segregation can only be accessed once they are taken out of segregation.

Practical Application to Policy-Making

Based on these potentially harmful psychological effects on inmates placed in solitary, a 2017 review by Ahalt et al advised a drastic reduction from the current use of solitary confinement, recommending that social segregation be limited to cases in which violent behavior results in no other way of achieving safety, as well as limiting isolation to as brief a duration possible while still being an effective correctional tool, and working with medical, public health, and criminal justice experts to develop legitimate alternatives (Ahalt et al, 2017).

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