

INITIAL FORAYS INTO

**PSYCHO
LOGICAL
SCIENCE**



**JOHN BROWN
UNIVERSITY**

Initial Forays into Psychological Science

John Brown University

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Initial Forays into Psychological Science

John Brown University

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From the Faculty Sponsor

The fifteenth volume of *Initial Forays into Psychological Science* (IFPS) is designed to celebrate the excellent work of undergraduate researchers in psychology. As the replication crisis and other issues are beginning to be addressed by professional psychological researchers, the quality of work being done by undergraduate researchers at this crucial time in the history of the field gives hope for the future.

This volume of the journal represents the quality work of the student authors and the talented peer review board that reviewed the articles for publication. The completion and publication of the journal this year was due to the talent, persistence, and hard work of the Content Editor, Annika Stanley. I also appreciate the excellent work of the student authors who have given future students an excellent example of psychological research reports to emulate.

Richard Froman, Faculty Sponsor of IFPS



The members of the Student Editorial Board for the thirteenth volume of IFPS. (Back row, Left to right): Drew Hatman, Ben Sweatman, Managing Editor Annika Stanley, Gentry Jones. (Front row) Margaret Curren, Hanna Jaculbe, Gabrielle Sabin. Not pictured: Lindsay Demaris.

Instructions for Contributors

Initial Forays into Psychological Science (IFPS) is a journal which solicits manuscripts from undergraduate students in psychology classes at John Brown University. Manuscripts may include research projects conducted for classes, theoretical and review papers written for classes and empirical or theoretical research conducted as part of a course of independent study while an undergraduate student at John Brown University.

1. The author must have been a student in a psychology class at John Brown University at the time the paper was written. The paper must have been read and commented on by a John Brown University Psychology Department faculty member. Submission of research to IFPS is not limited to psychology majors but it is limited to students enrolled in psychology classes at John Brown University.

2. Manuscripts can not be submitted for publication in IFPS while they are being considered for publication anywhere else.

3. Manuscripts must be formatted in accordance with the manuscript style of the latest edition of the American Psychological Association (APA) Publication Manual. Manuscripts must be submitted electronically as an attachment in either Microsoft Word format or Rich Text Format. Use a 12 point readable font (such as Times New Roman).

4. In the submission e-mail, provide your school e-mail address and a more permanent summer or post-graduation e-mail address, if one is available.

5. The review process will be completed during the course of the next Fall semester by the students in the Advanced Research Seminar. The members of the ARS course will act as reviewers for all of the submitted manuscripts and there will be a student editorial board appointed by faculty. The reviewers will work in groups so that students' submissions will not be reviewed by anyone in their group. The review process is likely to require the author to make some revisions over the course of the Fall semester. Revisions need to be made and re-submitted in a timely way in order to ensure full consideration for publication.

6. The IFPS will be made freely available online for use by Research Methods students in the following semester to be used for assignments in the course. It will be published on the Psychology Department website at <http://acadweb.jbu.edu/psychology/IFPS/IFPS.htm> in a format that can be openly accessed by employers, graduate schools, family and friends, etc.

7. E-mail submissions to Dr. Rick Froman at: **rfroman@jbu.edu**. Include the following statement in your e-mail message: "I, [your name] give permission to have the attached manuscript considered for publication in IFPS. I give permission to the journal (IFPS) to publish my work and sell it to university students at cost. I understand that I will retain the copyright and the right to submit my manuscript to any other publication I desire."

Interaction of Note-taking Modality and Attentional Abilities on Note-taking Difficulties

Margaret C. Curren

Note-taking is seen by many as a necessity for academic success. While many studies have been done on note-taking, the prevalence of technology in today's classrooms presents another aspect in need of studying, the differences between computer based notes and handwritten notes. Some have already researched this. However, the current research does not consider students with different levels of attention. This study focused on the amount of note-taking difficulties that students with high or low attention had while either typing or handwriting notes. The hypothesis was that students who have low levels of attention will have less difficulty typing notes than they do handwriting notes. Participants were randomly selected from the undergraduate population of John Brown University to receive emails inviting them to take one of two anonymous online surveys. The emails were identical, except one included a link to a survey on hand-written notes, and one a link to a survey on typed notes. Both surveys included questions about note-taking preferences, note-taking difficulties, and an attention section based on diagnostic criteria for attention deficit disorder from the DSM-5. Analysis did not prove the hypothesis but did find that students with lower attentional abilities have significantly more difficulties with note-taking. There is still a need for more research in this area, and future research could try investigating the benefits of different note-taking methods for students from other populations or replicate this study with a larger sample size and different method to potentially find different results.

For many past generations, all note taking was done by hand, but in modern day class rooms you are likely to see many students who type their notes on a laptop or other electronic device. While laptops could potentially be distractions for students, when used responsibly they can also be valuable academic tools. Students may prefer laptops as typing can be faster than handwriting notes; however, some may also wonder if typed notes prepare students for tests as well as handwritten notes do. In a study by Mueller & Oppenheimer (2014) it was found that laptop using students tend to write notes verbatim instead of using their own words which may result in shallower processing and poorer performance on tests with conceptual questions.

However, Bui, Myerson, & Hale, (2012) found in one experiment comparing note taking strategies that students who typed notes verbatim did better on immediate tests than students

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I would like to express my gratitude towards the psychology department of John Brown University for approving this study. I would also like to thank every one of my 33 participants for making this project possible. Finally, I would like to thank Dr. Rick Froman for overseeing this project and assisting me throughout the design, implementation, and data analysis.

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who handwrote their notes. Also, in subsequent experiments focusing solely on strategies for computer based notes, their results showed that organizing notes prepared students more for delayed tests than verbatim notes, but when verbatim note takers were allowed to review their notes they performed even better than those with organized notes. While there is still a need for more research on the topic, it seems that the ability to type notes verbatim on a laptop could give students an advantage if they are reviewed, or organized, but simply typing them may not be enough for students to remember what is recorded. While the comparison of computer-based notes and handwritten notes is a topic still in need of research as a whole, there is one area that is especially under-researched, and that is for students with learning disadvantages.

While there is some research on the handwritten note-taking skills of students with ADHD, limited or no research has been done comparing handwritten note skills to computer-based note skills of students with lower attentional abilities. The focus of the current study is on the choice between typing and handwriting notes for students who may have difficulty with sustaining attention.

The taking of notes may seem like a simple task, but it involves complex mental processes; it requires students to comprehend the concepts the lecturer is teaching them to a degree that allows them to paraphrase quickly, and then write that concept down before it is forgotten, all while still listening to the lecturer and taking in more concepts. Peverly, Garner & Vekaria, (2014) found that handwriting speed and the ability to sustain attention are both predictors of lecture note quality. Prevatt, Reaser, Proctor, & Petscher, (2007) found that students with ADHD had a more difficult time processing information. Because of these findings, I think students with lower levels of attention may find handwriting to be a difficult task, and because typing notes can be faster and possibly enable students to keep up with lecturers easier, my hypothesis is that students who have lower levels of attention will have less difficulty when typing notes than they do when handwriting notes.

METHOD

Participants

A power analysis indicated that, using a t statistic, 126 participants would be needed to detect a moderate effect. Participants were randomly selected undergraduate college students from John Brown University. Out of the 200 students that were invited, 33 actually completed the surveys.

Materials

The participants completed one of two online surveys, [one on handwritten notes](#) and [one on typed notes](#), each containing questions about note-taking modality, preferences, their grades, and attentional capabilities and or difficulties. 16 questions were measuring attention as a variable and were based on diagnostic criteria for attention deficit disorder from the DSM-5.

Procedure

Participants were randomly divided into two groups, and received emails that were identical except the first group received a link to a survey on hand-written notes, while the second group received a link to a survey on typed notes. The questions on the surveys did not differ, except one asked participants to answer questions based on a class in which they had only hand-written their notes, while the other asked them to answer based on a class in which they typed their notes. Both surveys also included a section that asked questions based on diagnostic criteria for attention deficit disorder from the DSM-5. The attention section was identical on both surveys.

RESULTS

In order to test the hypothesis, a 2 x 2 factorial ANOVA was conducted to compare the amount of note-taking difficulties between students with high and low attention and between students who took notes by hand or typed notes and to determine if there was an interaction between attention and note-taking modality. The results showed that students with high attention had significantly less difficulties taking notes than students with low attention, $F(1, 28) = 5.74, p = .02$. However, no difference was found between different note-taking methods and the amount of note-taking difficulties, $F(1, 28) = .32, p = .32$, and no interaction was found between attention and note-taking modality on note-taking difficulties, $F(1, 28) = .02, p = .89$ (see Figure 1).

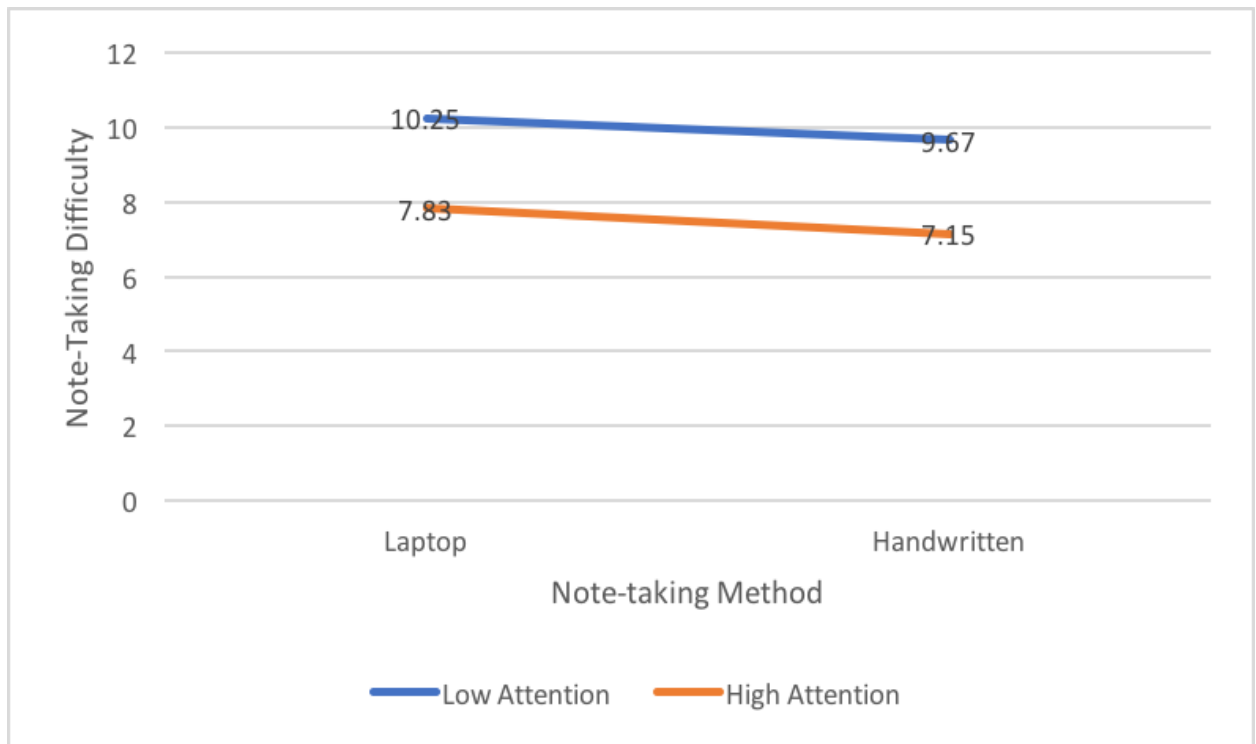


Figure 1. Note-taking method and attention levels in relation to note-taking difficulties.

DISCUSSION

The results of this study did not confirm the hypothesis that students who have lower levels of attention will have less difficulty with typing notes than they do when handwriting notes. However, the results did show that students who have lower levels of attention have more difficulties with note-taking in general. The results also did not replicate the findings of previous research, but this may have been due to a different method and smaller sample size. There is still a need for more research in this area, and future research could try investigating the benefits of different note-taking methods for students from other populations or students with learning disabilities. Future research could also replicate this study with a larger sample size and different method to potentially find other results.

Though the results of this study did not prove the hypothesis, the finding that students with lower attentional abilities do have more difficulty with note-taking shows that they may have different note-taking needs. Research investigating better note-taking strategies for these students could prove to be beneficial.

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Relationship Between Class Size and Class Grade Point Average

Hanna Faith H. Jaculbe

Previous research has found specific variables in the classroom have a relationship to student achievement. I sought to determine whether these variables, specifically class size, has a relationship with a certain average student achievement, specifically GPA, at John Brown University, a small, private university in Siloam Springs, Arkansas. The hypothesis was that students in large classes tend to have lower achievement than students in smaller classes. With an alpha level of 0.050, and a beta level of 0.200, an expected correlation coefficient of 0.275 would need to have a total sample size of 102 participants. Sixteen traditional undergraduate students from the university completed a 40-item online survey. This survey posed questions regarding the number, grade, and difficulty of both small and large classes as well as GPA and student' preference for either small or large classes. Analyses revealed no significant difference between participants in large classes and small classes. A one-tailed t-test revealed a significant difference between the grades of students in large classes and students in small classes $t(15) = 2.12, p = .02$. The mean GPA of large classes was significantly lower than the mean GPA of small classes, which seems to indicate that student achievement for large classes tended to be lower than the student achievement in small classes. Future researchers might study samples from public universities as well as differences between grades in core curriculum and major specific classes.

During the college search, students look at many different factors before they finally decide on one. One of these factors is class size. While some policy makers have argued that class size does not matter, The National Education Policy Center (NEPC, 2014) stated that class size is an important determinant of student outcomes.

The average public university class size is around 30 students, but the average private university class size is around 25. Class sizes vary depending on the type of class. Core Classes at Liberal Arts colleges tend to have larger class sizes than major specific, upper level classes (Guder, Malliaris, & Jalilvand, 2009).

The majority of previous research on this topic has involved elementary, intermediate, and secondary institutions (Diette & Raghav, 2015). This research has shown that larger class

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sizes tend to negatively affect average GPA. The hypothesis is that larger class sizes negatively affect average perceived student achievement, specifically the average grade in the class.

METHOD

Participants

A random sample of 100 traditional undergraduate students were chosen from the population of John Brown University (JBU). In order to have an 80% chance of a moderate effect there would need to be a total of 102 participants. Of the 100 traditional undergraduate students invited through campus email to take the survey, 16 students completed the survey.

Materials

Participants completed a [40-item online survey](#). The survey was accessed by following a link that was sent to the randomly selected students by email. The survey consisted of three sections. The first contained questions pertaining to number (of classes), grade, and difficulty of small classes, the second contained questions pertaining to number, grade, and difficulty of large classes, and the third section contained questions pertaining to the participants' GPA and their preference regarding large or small classes. The survey gave specific definitions of "large" and "small" classes, where "large classes" were defined as classes of 15 or more students and "small" classes were defined as classes of less than 15 students. The first section of the survey had an informed consent statement that explained their consent would be indicated by completing the survey.

Procedure

The random sample of 100 traditional undergraduate John Brown University students received an email which explained the online survey as well as provided a link to it. The researcher emailed the students, gave her name, and asked the students to take part in the study.

RESULTS

To test the hypothesis, there were questions on the survey regarding the letter grade obtained in small and large classes. These grades were then converted into numbers and the average grade for large and small classes was calculated. A *t*-test compared the average grade in large classes to the average grade in small classes.

Sixteen students responded to all the questions on the survey and contributed data to compare the average grades of students in large classes and students in small classes. A one-tailed *t*-test revealed a significant difference between the mean grades of students in large classes and students in small classes $t(15) = 2.12, p = .02$. Figure 1 shows the difference between the means for the individual students. The mean GPA of large classes was significantly lower than the mean GPA of small classes, with an average of 2 grades below small classes, which seems to

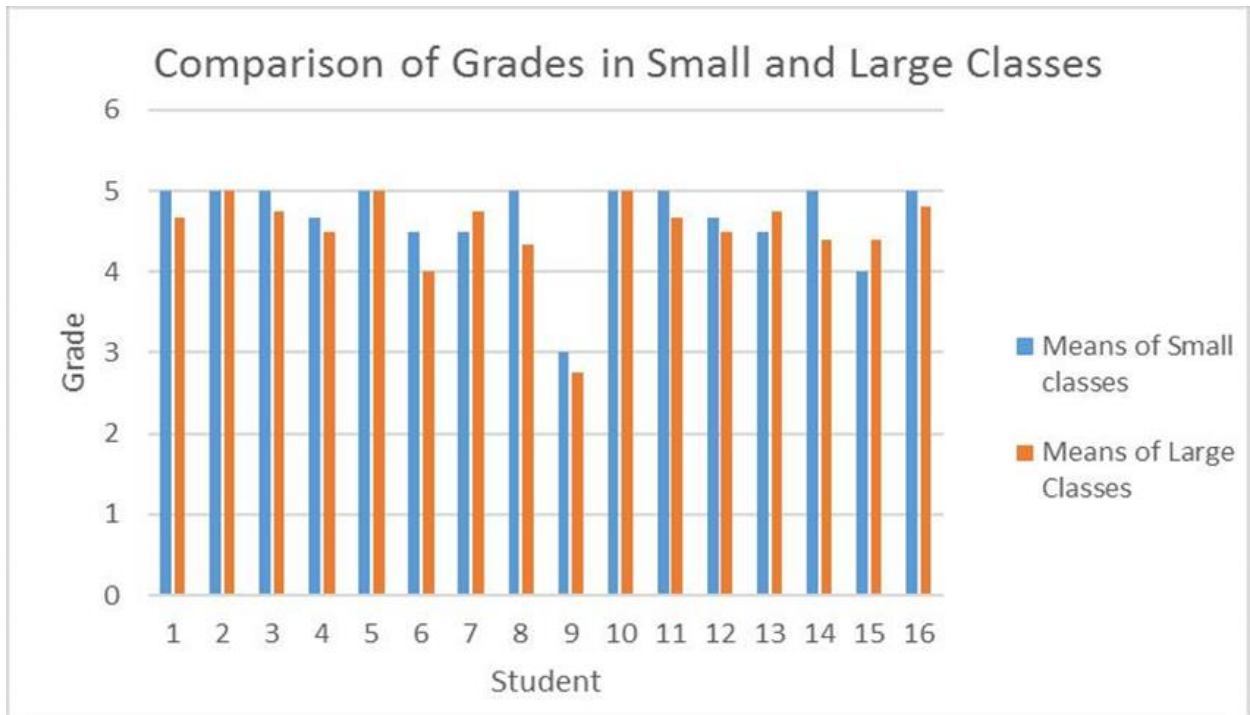


Figure 1. Significant difference in average grade for each individual student between large and small classes, where the means of large classes tend to be lower than the means of small classes.

DISCUSSION

A one-tailed *t* test found a significant difference between the grades of students in large classes and small classes. This affirms what prior research has found, that there is a difference between the means of the grades of students in large classes and the grades of students in small classes.

The study by the NEPC was similar to the present study in that it evaluated the GPAs of college students who were in large and small classes. This study found that the reduction of class sizes caused an increase in student performance. The study by Guder, Malliaris, and Jalilvand, found that increasing the average class size of students had no significant effect on the performance of the students or instructor, which did not have the same results as the present study. The study by Diette and Raghav suggested that students in large classes tended to have low GPAs. This study was consistent with the findings of the present study.

The present study on the JBU campus showed that the grades of the participants in small classes tended to be higher than the grades of participants in large classes. This is consistent with the study by the NEPC, who found that by reducing the class sizes, students tended to have higher GPAs. The JBU community should be aware that students tend to achieve more in smaller classes and try to keep the size of classes small.

Future researchers might study whether there is a difference between the grades in Core Curriculum classes versus the grades in Major Specific Classes or Honors classes. Also,

larger classes at JBU tend to be Core Curriculum classes, which may have influenced the difficulty and thus influence the grades achieved in these classes. Smaller classes at JBU tend to be Major Specific or Honors classes, which also may influence the difficulty and the grades achieved in these classes. One might also study the effect of student's interest in classes. Students may have more of an interest in Major Specific classes, which tend to be small classes, which may influence the grade achieved in these classes. Future researches will need to provide definitions for "large" and "small" classes which may also influence student's achievement. The size of John Brown University may be a factor as well, so further researchers might do further studies in the relationship between class size and GPA at large state schools.

The results of this study were statistically significant. This research confirmed previous research that larger classes tend to have a negative effect on student's grades. It is important for universities to understand that smaller classes tend to have a positive effect on grades.

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Various Journaling Behaviors Related to Self-Reported Mental Health Rating

Annika H. Stanley

Previous researchers have found that different methods of journaling influence the mental health rating of people across all demographics. The current research sought to determine whether distinct types of journaling related to a self-reported mental health rating, and how these types of journaling related to mental health ratings. The hypothesis was people using gratitude journals and/or those for day-to-day recording show a higher mental health than those that journal for negative emotional expression or who do not journal at all. Analyses revealed a significant difference between participants mental health rating who use positive (gratitude, day-to-day, or devotional) journaling, negative emotional expression, or those who do not journal. The Tukey HSD test indicated no significant difference between the individual groups, so the only significant difference was between the gratitude/day-to-day journaling and negative journaling groups. This research encourages promotion of positive journaling for its benefits on mental health, and good practice for a healthy lifestyle.

According to the Anxiety and Depression Association of America, anxiety plagues 40 million people, 18.1% of the population that is aged 18 and up (2016). Depression, in all different forms, affects an equally large group. Major Depressive Disorder alone affects 16.1 million people, 6.7% of the United States populations over 18 (2016). These numbers of course do not include those that are yet to be professionally diagnosed.

Both anxiety and depression have a multitude of subcategories that can be distinguished. For the purpose of this study they will be referred to as a single category. Therefore, any participant that is diagnosed or self-diagnosed as having depression or anxiety will be assigned to the proper corresponding category. Those in the anxiety category typically suffer from excessive worry about health, family, money, and/or work. This worry can to disrupt social life and is observed for a majority of days over a six-month period (ADAA, 2016). Those suffering from depression would have symptoms of deep sadness, hopelessness/pessimism, extreme fatigue, low appetite, insomnia, and/or suicidal thoughts (ADAA, 2016). Often times, these mental illnesses have co-morbidity and symptoms will overlap (ADAA, 2016). Even when the symptoms do not overlap, anxiety is often initially treated with anti-depressants instead of anxiety medicine because of the similarities in symptoms (ADAA, 2016).

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I would like to acknowledge the Psychology department at John Brown University for its approval of this study. I would also like to thank Dr. Rick Froman for his advice in designing the study and his assistance in analyzing the data. Finally, I would like to thank the 51 participants who completed the online survey as partners with me in this research.

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When suffering from these mental illnesses, a treatment plan that is medicinal and self-administering is normally used. The jargon for this is “self-care”, defined by Christine Meinecke as things included in a healthy lifestyle that help manage a person’s stress (2010). Self-care can include anything that helps promote a healthy lifestyle and manage stress like the influence of vitamins, diet, exercise, and journaling.

Journaling includes a variety of practices that all are unique in their own way. There are day-to-day journals where a person records the mundane daily events and emotions; gratitude journals specifically focused on gratuitous thoughts; bullet journals which are a mix of planning, journaling, and creative expression; spiritual/devotional journals commonly found in religious lifestyles, used for personal time with God and/or Bible study activities; and emotional processing journals with a strict emotional focus, often with a negative focus. Research by Emmons and McCullough (2003) shows that journals associated with positive mental health are along the lines of ones that focus on gratitude, productivity, and highlights of both positive and negative emotions. Journals in this category include day-to-day, gratitude, bullet, spiritual/devotional, and activity-based journals. Ullrich and Lutgendorf’s (2002) research states that a negative emotional processing journal is detrimental to a person’s mental health (2002). Journals included in this category involve emotional processing, as the evidence behind them demonstrates a negative effect on mental health.

The previous studies, focus on gratitude vs. negative emotional processing. Gratitude, as claimed by Kerr et. Al (2015), has a counteracting effect on anxiety and symptoms of depression like pessimism and extreme sadness, whereas negative emotional processing, as explained by Ullrich and Lutgendorf (2002), shows a decrease in mental health rating. Given the reasonable consensus that positive, gratuitous journaling results in a healthier psyche than a negatively grounded journaling practice.

Previous research shows a multitude of factors that allow for this increase of mental health in the presence of journaling. Ulrich and Lutgendorf (2002) focused on people with mental and physical maladies and how journaling related to them. Emmons and McCullough (2003) used a nonclinical population to correlate specific modalities of journaling with mental health. With these studies in mind, the purpose of this study was to show the relationship of journaling and mental health for college students on a Christian campus. The hypothesis is that people using gratitude journals and/or those for day-to-day recording will show a higher mental health than those that use journaling habits for negative emotional expression or who do not journal at all.

METHOD

Participants

A random sample of 100 students was chosen from the undergraduate population of John Brown University (JBU). A power analysis indicated that a sample size of 52 would provide an 80% power to detect a significant large effect. Out of the 100 students invited through campus email to take the anonymous online survey, 51 actually completed the survey. The age range of respondents to the survey was between 18 and 36 years old, with an average age of 20.5 years.

Materials

The participants completed an [online survey](#) consisting of questions created by the researcher covering journaling frequency, mental health rating, and health habits. The test was developed to be a reliable and valid measure of mental health correlation to journaling habits; however, the trial run showed high validity and low reliability and adjustments were made to compensate for the low reliability. More questions were added to the mental health section to increase the test's reliability. The instrument posed 29 questions and contained demographic items sufficient to describe the sample.

Procedure

The random sample of college students received an email explaining the survey and providing a link to it. The students read the informed consent that explained that they would indicate their consent by completing the survey.

RESULTS

In order to test the hypothesis, the supplemental questions on the survey regarding mental health rating were compiled to provide a sum of mental health rating. The mental health rating questions were all interval scales of 1 to 7, with 1 being a low score for mental health and 7 being a high score for mental health.

Fifty-one students responded to all questions on the survey. A simple ANOVA compared the overall mental health scores of the three groups: gratitude/day-to-day journaling, negative emotional expression journaling, and those who do not journal. The simple ANOVA revealed a significant difference between the gratitude/day-to-day journaling, negative emotional expression journaling, and those who do not journal, $F(2,48) = 5.1, p < .01$. The Tukey HSD test conducted after the significant ANOVA revealed no significant difference between the individual groups so the only significant difference was between the gratitude/day-to-day journaling and negative journaling groups. This indicates that the largest difference between the positive and negative groups of journaling is significant (See Fig. 1).

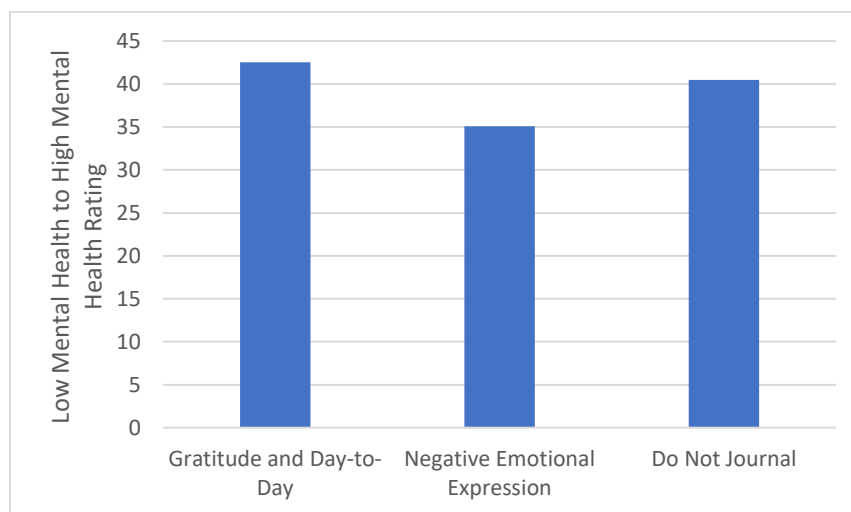


Figure 1. Significant difference in mental health rating between the three groups of the most frequent purpose of journaling.

DISCUSSION

A significant difference was found between the various types of journals and the mental health rating. These results are supported by the previous research done in this area.

Emmons and McCullough (2003) found that positive journaling—those categorized in gratitude, day-to-day, and/or devotional for this project—improved mental health ratings. This study was different in that they had groups practicing the different methods of journaling and had a control group with which to compare mental health rating scores. The current study only asked for the method and purpose of journaling and then related it to a self-reported mental health rating, but the results were similar and this current study supports the previous study.

Ullrich and Lutgendorf's (2002) finding that negative emotional expression journaling decreased a person's mental health was replicated by this study. Their study compared strictly emotional, to cognitive and emotional, and strictly cognitive journaling. While the current study was *ex post facto* instead of a true experiment, the results are in line with previous research. In fact, this study provides evidence that there is a significant difference between the journaling groups. The fact that the Tukey multiple comparison showed no significant differences can be explained by the conservatism that the Tukey HSD test uses when identifying significant differences. The difference in means for mental health ratings may not have been large enough for the Tukey HSD, but they were clearly different by at least 5 points.

The research supporting the conclusions may come from studies conducted over a decade ago but the results still align allowing for support of the theory that negative emotional journaling is related to a lower mental health rating in comparison to positive journaling. However, those that do not journal appear to be in the middle of these two groups, which was not hypothesized in this study. In previous research like that of Ullrich and Lutgendorf (2002), negative emotional expression journaling was related to lower mental health, but Ullrich and Lutgendorf did use a control group of non-journalers. Emmons and McCullough (2003) did have a control group of non-journalers, but without a negative emotional expression group in their study, there was no evidence showing that non-journalers would be higher in mental health than negative emotional expressive journalers. Their research only supports the conclusion that non-journalers had a lower mental health rating than those that positively journaled.

Considering the most recent research on this topic was done over 10 years ago, future researchers should continue to investigate the group difference between different methods of journaling. The push for higher mental health care is on the rise, and journaling as a part of treatment programs could be an effective low impact, low side effect treatment to be used by psychologists/psychiatrists. This research also has the capacity to be expanded to secular campuses to see if the religious environment had any influence on the significant difference found between journaling methods. It could also be studied in older generations in a more professional setting instead of an educational setting. The typical life stage of college can be a time of varying emotions, and that could also have played a role in the results related to mental health rating. Looking at those in a professional setting, or even a relaxed setting with

higher age average, might produce different results—or it would further solidify the current evidence as to the benefits of positive journaling in being related to a higher mental health rating than negative emotional expression journaling.

The practical application of this research is the support for the benefits of journaling as a self-care technique. Not only does the research support evidence for the effects of positive journaling, it also supports the evidence found against negative journaling, and it sheds new light on where not journaling falls into the spectrum. Something as simple as writing down gratuitous thoughts can increase mental health and can easily be applied to almost every individual's life to help improve it, while something equally as simple as writing down negative thoughts can be detrimental to an individual's mental health. These results call for the promotion of positive journaling as a healthy life habit.

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