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Intuition is the official undergraduate journal of the Brigham Young University psychology department. It provides an opportunity for publishing excellent student literature reviews, essays, and original research in psychological science. Through doing so, Intuition strives to create experiential learning opportunities for student authors and editors, promote scientific literacy, and share high-quality, relevant science. For submission guidelines and instructions, see the verso.
Editor’s Note

Intuition: Where We Are and Where We Are Going

Over the past year since Intuition was first published online, its content has been viewed and downloaded thousands of times and has reached readers throughout the world. As Intuition continues to grow, the journal will continue to be composed of high-quality content that enrichens and enlightens its readers. The current state of psychological science is exciting, and our students have caught the wave in publishing on some of the most innovative and relevant topics across the field. More and more submissions are coming into our journal and more and more people across the world are viewing and using the research done by our students.

As the new editor-in-chief of Intuition, I, along with my editorial staff, am committed more than ever to sharing science, giving students opportunities, and bringing together those with related interests to expand their knowledge and find ways to better address the issues we face in psychological science today. We are excited for what the future holds for psychological science, and we look forward to engaging in that future through the production of Intuition.

Acknowledgements and Contributions

The publication of this journal, however, would not be possible without the efforts and contributions of the editorial staff and faculty reviewers. Our editors volunteer their time to collect content for this journal and help the authors produce manuscripts that are engaging, enlightening, contribute to the conversation in psychology, and share meaningful progressions in science with others. They give of their time to contribute to something bigger than themselves; I am thankful to them for that.

I am also thankful to each of the faculty from the Department of Psychology and the School of Family Life who have given of their time to help students prepare their manuscripts for publication in this issue. Their willingness to guide and instruct students’ writing helps the students learn, grow, and produce their best work.

Finally, I feel sincerely grateful for Intuition’s faculty advisor, Dr. Hal Miller. His careful concern for the affairs of the journal, as well as thoughtful mentoring, advice, and suggestions make it possible for us to take this journal where we would not be able to ourselves.

Joining the Intuition Community

Intuition is a journal, but it is also a community. If you would like to become involved with the Intuition community by joining our editorial team, submitting manuscripts, or become involved in any other way, please contact us at byupsychjournal@gmail.com. Though the journal is centered around undergraduate submissions, we welcome graduate students, faculty, and members of the community to become involved with Intuition. To find ways in which you can become involved with Intuition, visit our website at intuition.byu.edu.

This Issue: What’s Inside

This issue of Intuition includes articles from nine authors on topics ranging from the influence of gratitude on marriage relationships to the cognitive effects of learning a second language. I encourage you to browse the articles and find topics and issues that interest you. Our student authors have valuable insights into the research they have conducted; they have spent many hours familiarizing themselves with and collecting research, and organizing their efforts into thoughtful work that provides further insight into the research literature. The articles within this issue, as well as those in past issues of the journal, can be viewed online at scholarsarchive.byu.edu/intuition.

If you have any comments or questions about our journal or any of our published articles, please email us at byupsychjournal@gmail.com.

Chayce Baldwin
Editor-in-Chief
Healthy Habits to Reduce Sleep Deprivation in College Students

Jenna Bair
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Abstract

Sleep can affect many regular functions in the body. Consequently, the physiological and psychological effects of sleep deprivation have many ramifications, including long-term health issues, depression, and eating disorders (Alhola & Polo-Kantola, 2007; Beiter et al., 2015; Jarcho, Slavich, Tylova-Stein, Wolkowitz, & Burke, 2013; Ozsoy, Besirli, Unal, Abdulrezzak, & Orhan, 2015). Despite the importance of sleep for regulative processes, studies indicate that the general population does not receive adequate sleep quality (Watson et al., 2017). College students represent a large demographic and often do not obtain enough sleep (Gaultney, 2010). Thus, it is proposed that collegiate institutions and students work together to combat the increasing issue of sleep deprivation. Universities should provide assistance by utilizing their resources to implement informative presentations and applicable course curriculum on the dangers of sleep deprivation. When taught, students are enabled to implement healthy habits. Healthy habits may include consistent sleep schedules and proper sleep length. Research suggests that as students implement these habits, both academic performance and overall quality of life will improve (Alhola & Polo-Kantola, 2007; Thomas, 2015).

Keywords: sleep deprivation, college students, depression, eating disorder
Scientists have conducted extensive research on sleep, but findings have been somewhat ambiguous, especially concerning the amount of sleep needed. Some studies claim college-aged students should be getting approximately seven hours of sleep, while others claim students need as much as eight or nine hours (Alhola & Polo-Kantola, 2007; Wang, Y. Jiang, Zhang, Liu, & F. Jiang, 2016). It is difficult to determine a universal standard for sleep, because sleep quality involves many components and is influenced by both genetics and social factors (Luyster et al., 2012; Önder, Beşoluk, Iskender, Masal, & Demirhan, 2014; Watson et al., 2017). Despite the countless studies that have been done on sleep, the general public does not seem to be informed of or hold much regard for the findings. Thus, it is necessary to provide a synthesis of available information so that students can make informed decisions concerning their sleep habits.

Today’s society has reduced sleep to an afterthought rather than making it a priority. In the last 100 years, the average amount of sleep adults obtain has dropped about two hours per night while their responsibilities have remained constant, if not increased (Watson et al., 2017). Maladaptive sleep habits can begin at any stage of life, but commonly start in college (Buboltz et al., 2006). Once routines are set, poor habits are frequently sustained beyond college, as graduates enter the workforce (Watson et al., 2017). As substandard patterns of sleep are perpetuated, lack of sleep may start to affect performance in professional settings, as well. Academic performance in college can be a significant predictor of future success, because it can project students’ chances of obtaining internships and may also impact annual earning potential after graduation (Taylor, Vatthauer, Bramoweth, Ruggero, & Roane, 2013). Due to its extensive ramifications, sleep deprivation should be remedied immediately. Although sleep deprivation in college students can be largely attributed to personal choices, which impact both quantity and quality of sleep, collegiate institutions should promote healthier sleep habits, because lack of sleep in college students negatively impacts long-term health, cognitive functioning, and academic performance.
Effects of Sleep Deprivation

Students and collegiate institutions should work to remedy the growing epidemic of sleep deprivation. Studies have made connections between sleep and many different health issues (Alhola & Polo-Kantola, 2007; Pejovic et al., 2013). Proper sleep is imperative for both mental and physical aspects of long-term health (Helvig, Wade, & Hunter-Eades, 2016). Sleep loss can affect a surprising number of both physiological and psychological functions such as energy, hormone levels, and memory. Thus, it is important to address both the physiological and psychological effects, specifically pertaining to college students. The impairment of regular functions can affect mental health and academic performance (Khalasa et al., 2016). Universities should recognize the importance of academic performance and general well-being in their students and provide proper education on the detrimental effects of sleep deprivation. Perhaps, if students gain a clearer understanding of how sleep loss affects the body, they will be more inclined to make healthier choices.

Physiological Health

Sleep deprivation affects a vast number of physiological factors, including energy conservation, tissue recovery, fatigue, amount of plasma in blood, and hormone levels (Alhola & Polo-Kantola, 2007; Pejovic et al., 2013). Hormones are important for regulating the body’s response to various situations and stimuli (Garcia-Garcia, Juárez-Aguilar, Santiago-Garcia, & Cardinali, 2014; Jarcho, Slavich, Tylova-Stein, Wolkowitz, & Burke, 2013; Jaremka et al., 2014). Cortisol, leptin, and ghrelin are a few of the major hormones that can be affected by sleep (Jarcho et al., 2013; Ozsoy, Besirli, Unal, Abdulrezzak, & Orhan, 2015). These hormones regulate functions related to stress, emotion, hunger, and satiety (Garcia-Garcia et al., 2014; Jarcho et al., 2013; Jaremka et al., 2014). Extended periods of unbalanced hormones can lead to other major health issues such as depression and eating disorders (Beiter et al., 2015; Jarcho et al., 2013; Ozsoy et al., 2015). Cortisol, leptin, and ghrelin are only a few of the hormones that can be affected by sleep loss. Given the crucial role of hormones in the body, it is imperative that students get the proper amount and quality of sleep needed to maintain proper hormone regulation and other physiological functions.

Cortisol levels. When presented with a stressor, the body’s hypothalamic pituitary adrenal (HPA) axis works to produce a hormone called cortisol (Jarcho et al., 2013). Cortisol helps the body respond to various kinds of stress. Under regular conditions, a large amount of cortisol is released upon waking and steadily declines throughout the day (Jarcho et al., 2013). Sleep reduction can disrupt the regulation of cortisol, inflating typical levels, which often produces adverse effects in the body (Engert, Smallwood, & Singer, 2014; Jarcho et al., 2013; Luyster et al., 2012; Romero-Martinez & Moya-Albiol, 2016). Research has shown that cortisol plays a key role in mood regulation; individuals with high levels of cortisol often report increased negative mood states and display greater levels of anger (Engert et al., 2014; Romero-Martinez & Moya-Albiol, 2016). Deviations from natural cortisol levels can also lead to breast cancer, cardiovascular disease, post-traumatic stress disorder (PTSD), depression, and eating disorders (Jarcho et al., 2013). Elevated cortisol levels are directly correlated with both depression and suicidal tendencies (Gerber et al., 2013; D. O’Connor, Ferguson, Green, O’Carroll, & R. O’Connor, 2016). Approximately 20% of all individuals will have depression at some point in their life (Jarcho et al., 2013). This number increases significantly in college students (Gress-Smith, Roubinov, Andreotti, & Luecken, 2015). For example, in one study at a large southwestern university in the United States, almost 40% of students reported depressive symptoms (Gress-Smith et al., 2015). Research indicates that depression is a growing issue among college students. As students get proper sleep, they will have less risk of elevated cortisol levels, which may decrease their chances of experiencing depression.

Leptin and ghrelin levels. Leptin and ghrelin are other hormones that can be strongly linked to depression (Ozsoy et al., 2015). Studies show that sleep loss leads to an imbalance of both hormones (Broussard et al., 2016; Jaremka et al., 2014). When an individual does not receive a necessary amount of sleep, their leptin
levels drop and their ghrelin levels rise (Broussard et al., 2016; Jaremka et al., 2014). These hormones work in conjunction with one another to regulate both hunger and satiety (Garcia-Garcia et al., 2014; Jaremka et al., 2014). Thus, skewed levels of leptin and ghrelin are strongly connected with weight gain and obesity (Jaremka et al., 2014). Increased weight gain can lead to emotional discontent, often causing body distortion and eating disorders (Beiter et al., 2015). Body image is a significant stressor for college students, especially females (Beiter et al., 2015). Between 13% and 22% of female college students suffer from some form of disordered eating (Eisenberg, Nicklett, Roeder, & Kirz, 2011; Gan, Mohd Nasir, Zalilah, & Hazizi, 2011). Eating disorders have also been shown to be significantly correlated with depression (Beiter et al., 2015). The aim of all collegiate institutions should be to provide proper sleep education as a preventative measure for their students. As students learn and take the initiative to change their habits, their risk for eating disorders and depression may decrease.

Cognitive Functioning

In addition to numerous physiological effects, sleep deprivation also affects many psychological aspects. The less sleep that an individual obtains, the more cognitive functioning and performance are impaired, which can in turn affect academic performance (Khalsa et al., 2016). Particularly concerning for college students, sleep loss can increase fatigue and hinder memory processes (Alhola & Polo-Kantola, 2007; Doerr et al., 2015).

Fatigue. College schedules can include a variety of activities and obligations, including class, work, clubs, service opportunities, and social activities. Most college students are aware of the amount of energy necessary to keep up with their often-busy schedules (Buboltz et al., 2006). But, in order to maintain the energy levels they require, students need to obtain the proper amount of sleep (Doerr et al., 2015; Lund, Reider, Whiting, & Prichard, 2010). Poor sleep quality can lead to depression and fatigue which can, in turn, negatively impact an individual’s response to stress (Doerr et al., 2015; Valpiani, Brown, Thorsteinsson, & Hine, 2011). High levels of stress then have an adverse effect on sleep, which perpetuates the negative cycle (Lund et al., 2010). Increased fatigue can also lead to reduced motivation, which negatively impacts the ability to process information and to achieve goals (Stover, de la Iglesia, Boubeta, & Liporace, 2012). Valpiani et al. (2011) determined that better sleep reduces fatigue in depressed students. More research is necessary to make a clear connection, but it can be theorized that improved sleep may also reduce fatigue in sleep-deprived students who are not depressed.

Memory. A large concern for college students should be the effect that sleep deprivation has on memory. Extensive research shows a direct correlation between sleep deprivation and memory impairment (Alhola & Polo-Kantola, 2007). Memory impairment has been shown to impact performance on memory tasks, such as midterms and other memory-type tests that are administered in college. Tests can be a large portion of a student’s college grades, and thus, reduced performance on those tests can subsequently affect overall academic performance. Reduced sleep can affect both working and long-term memory (Alhola & Polo-Kantola, 2007). Students are often expected to recall large amounts of information for exams throughout the semester. Generally, professors will administer cumulative finals at the end of the semester, so students must be able to remember information for an extended period of time. The negative effects of sleep loss on memory should motivate students to make the necessary changes to prevent sleep deprivation.

Working memory. Sleep is especially important for working memory (Alhola & Polo-Kantola, 2007; Frenda & Fenn, 2016). Reduced sleep affects the frontal and parietal cortices of the brain, which are vital for working memory (Frenda & Fenn, 2016). Working, or short-term, memory is characterized by its four systems: the phonological loop, visuospatial sketchpad, episodic buffer, and central executive (Alhola & Polo-Kantola, 2007). The phonological loop stores audio information, the visuospatial sketchpad stores visual and spatial information, the episodic buffer integrates information, and the central executive controls them all.
Short-term memory is closely related to attention, so when one is affected, the other is, as well (Alhola & Polo-Kantola, 2007). Studies have shown that when sleep deprivation affects working memory, participants display both reduced speed and accuracy when completing memory tasks (Alhola & Polo-Kantola, 2007). College students are frequently required to recount information during timed tests. If their speed and accuracy are impaired, it is reasonable to suggest that they may not perform as well on timed exams. Thus, students should be aware of healthy habits and implement them to improve test performance.

Long-term memory. Sleep deprivation also affects long-term memory processes. These can be divided into two categories: declarative and non-declarative memory (Alhola & Polo-Kantola, 2007). Declarative memory utilizes accrued knowledge of the world as well as information concerning one’s own life. This information can be stored in audio or visual form and recalled at will. Reduced sleep negatively impacts the ability to recall information but does not seem to affect recognition of information. Non-declarative memory handles the knowledge required to perform everyday tasks. These may include functions such as motor and perceptual skills. Sleep deprivation can impair normal behaviors dependent on non-declarative memory, including language and other functions that are performed without explicit awareness (Alhola & Polo-Kantola, 2007). In a collegiate setting, it is important that students can perform at peak capacity and retain course information well. Thus, it is important that the processes involving memory are functioning correctly. If students create healthier habits, their academics and quality of life are likely to improve.

Healthy Sleep Habits

It is important that students are made aware of proper sleep habits, especially considering the rigorous schedule that college life requires. Additionally, students should be informed of the warning signs and risks associated with intrinsic sleeping disorders—disorders that arise within the body, as opposed to disorders that arise due to external factors. This will enable them to be aware of any risk factors so that they can contact a professional when they have concerns. Due to the numerous physiological and psychological effects discussed previously, it is imperative that students implement healthy habits to prevent sleep deprivation and sleeping disorders. One of the greatest predictors of sleep health is sleep quality (Alhola & Polo-Kantola, 2007; Önder et al., 2014). There are many aspects of sleep health that ultimately contribute to sleep quality. These factors include consistency, sleep/wake times, and sleep length (Alhola & Polo-Kantola, 2007; D. Kay, personal communication, February 21, 2017; Önder et al., 2014; Watson, 2017). In addition to healthy habits, many tools are used to measure and evaluate sleep. For students to create better habits, they must know what healthy habits to implement. Once students are aware of the recommendations and begin to follow them, their school performance and overall quality of life will likely improve.

Identifying Sleep Disorders

The associated features of a sleep disorder can vary greatly, but students should be informed of factors associated with intrinsic sleeping disorders such as insomnia, narcolepsy, hypersomnia, sleep apnea, and restless leg syndrome. This becomes important in that 27% of college students may be at risk for at least one sleeping disorder (American Academy of Sleep Medicine, 2001; Gaultney, 2010). These can sometimes be prevented through proper sleep hygiene, but students and university faculty members should be aware of the symptoms of serious disorders (Centers for Disease Control and Prevention, 2016). The third edition of the International Classification of Sleep Disorders (ICSD) provides detailed information on various sleep disorders and the process of diagnosis (American Academy of Sleep Medicine, 2001). The diagnostic criteria in the ICSD include a principal complaint, a pathophysiological abnormality, an associated feature, objective documentation, the presence of medical or mental disorders, and the presence of another sleep disorder (American Academy of Sleep Medicine, 2001). Warning signs may include frequently taking more than 30 minutes to fall asleep; long naps during the day;
falling asleep at inappropriate moments (usually while sitting still); constant fatigue; negative mood states; interrupted sleep; a tingling sensation in the legs at bedtime; loud snoring, breathing, or gasping while sleeping; or difficulty focusing throughout the day (American Academy of Sleep Medicine, 2001; Watson, 2017). If a student displays any of these symptoms three or more nights per week for more than a month, it is recommended that they keep a daily sleep journal for approximately two weeks and consult a professional for help (D. Kay, personal communication, February 21, 2017). Grimes (2013) reported in one study that students with sleeping disorders were 1.28 times more likely to receive a lower GPA than other students. Thus, it is important that sleep disorders are addressed as soon as possible to improve academic performance and overall quality of life.

**Sleep Quality**

Sleep quality is arguably the ultimate indicator of sleep health. Despite its importance, only 11% of college students typically meet the criteria for good sleep quality (Gilbert & Weaver, 2010). This is a major concern, because students with poor sleep quality often report an elevated number of issues with both physical and psychological health, which can subsequently affect academic performance (Lund et al., 2010). Many aspects of sleep quality must be addressed. Sleep quality can be affected by consistency, sleep and wake times, and sleep length (Alhola & Polo-Kantola, 2007; D. Kay, personal communication, February 21, 2017; Önder et al., 2014; Watson, 2017). Each of these elements affects sleep in a different way. Students should implement healthy habits in order to improve each factor of sleep quality. Due to the practical significance of sleep quality, numerous measurement tools have been developed. Students should be aware of the common tools and understand how they are used. As students gain more knowledge concerning sleep, they will be enabled to take responsibility for their personal choices and to make the necessary changes to prevent sleep deprivation.

**Factors of sleep and healthy habits.** The many different aspects of sleep are important on an individual level, but together they contribute to overall sleep quality, as well. The goal should be to achieve what Dr. Kay, a sleep researcher and professor at Brigham Young University (BYU), calls the “sweet spot” for sleep. This sweet spot is where “an individual does not have to think about sleep; they must neither chase it nor is it chasing them” (D. Kay, personal communication, February 21, 2017). To progress toward this state, an individual should correct poor habits in each area that affects sleep quality (D. Kay, personal communication, February 21, 2017). The main contributing factors include consistency, sleep and wake times, and sleep length. Due to the individual effects of each aspect influencing sleep quality, there are specific habit recommendations for each of these, as well.

**Consistency.** The principal recommendation from Dr. Kay (personal communication, February 21, 2017) is to be consistent when it comes to sleep schedules. Each morning, the body’s circadian clock is reset, and when an individual’s sleep schedule is not consistent, the natural phase is disrupted (D. Kay, personal communication, February 21, 2017). It is common practice for college students to stay up late and wake up early on weekdays and then to sleep in on the weekends to “make up” for lost sleep, but this does not satisfy the sleep debt accrued throughout the week (D. Kay, personal communication, February 21, 2017). Instead, students should try to develop a consistent pattern of going to sleep and waking up at the same time every day (D. Kay, personal communication, February 21, 2017). Although this may be one of the most difficult adjustments for college students, it could also be one of the most beneficial changes.

**Sleep/wake times.** When setting a consistent schedule, students should determine what will work best for them. Some studies have shown that earlier wake times lead to improved performance, but no definitive guidelines currently exist, which is likely due to the genetic factors involved (Önder et al., 2014). Current society operates on a morning-based schedule, wherein work and classes are often in early in the morning, and individuals are encouraged to rise early. Despite the prevalence of morning responsibilities and deadlines, some individuals with nighttime preferences...
may perform better when on a later schedule (D. Kay, personal communication, February 21, 2017). Unfortunately, the research regarding sleep/wake times and the effects of morning/nighttime preferences is somewhat lacking. Thus, it is up to the discretion of the individual to set and to maintain a schedule that will be most beneficial.

**Sleep length.** The number of hours of sleep adults need to function optimally is largely up for debate in the scientific community. The literature available is not always consistent, although recommendations do tend to fall within a range of 7-8.5 hours per night (Alhola & Polo-Kantola, 2007; Luyster et al., 2012; Wang et al., 2016). Discrepancies in the findings could be attributed to the fact that both social and genetic factors affect how much sleep individuals need (Önder et al., 2014; Watson et al., 2017). Due to the genetic and social factors affecting sleep, a student may find their personal sleep needs to be different from the recommended amount. Individual needs can be determined by keeping a detailed sleep journal averaging the amount of time spent in bed and napping and including added factors such as nighttime sleep quality and daytime sleepiness (D. Kay, personal communication, February 21, 2017). It is imperative that students strive to obtain the optimal amount of sleep, because restricted sleep, both short-term and long-term, has been linked with negative mood states and mental health problems (Beï, Manber, Allen, Trinder, & Wiley, 2017). Chronic reduction of sleep also affects the immune and inflammatory systems, which can increase susceptibility to the common cold and other illnesses (Watson et al., 2017). Despite these correlations and numerous other negative health effects of sleep restriction, approximately one-third of adults only sleep for six hours or less each night (Watson et al., 2017). Although there are no definitive guidelines, students should try to get an average of seven or eight hours of sleep per night. If this does not seem adequate, it may be helpful to start a sleep diary to determine personal sleep needs.

**Measurement tools.** Scientists have developed many different measurement tools to evaluate the various aspects of sleep and diagnose sleeping disorders. Two of these tools that appear frequently in sleep studies are the Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale (ESS) (Gilbert & Weaver, 2010; Khalsa et al., 2016). Both are self-reported questionnaires that allow professionals to assess sleep, but they cover different aspects of sleep (Gilbert & Weaver, 2010; Khalsa et al., 2016). While noting that official tests should be administered by a professional, it may be beneficial for students to become aware of these tests. If students understand how these measurement tools work, they may have a better idea of how to interpret warning signs they observe in themselves and their classmates. If students suspect a sleeping disorder, they should consult a professional as soon as possible. Doing so may help to improve academic performance and quality of life.

**The Pittsburgh Sleep Quality Index (PSQI).** It may be advantageous for students to become familiar with this tool (see Figure 1). The PSQI assesses sleep quality over the prior month (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). The self-reported questionnaire contains 19 items that are combined to create seven component scores (Buysse et al., 1989). These scores include subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction (Buysse et al., 1989). When added together, these scores generate a global score which can be used to determine the difference between “good” and “poor” sleepers (Buysse et al., 1989). This can be an effective tool for professionals in the process of diagnosing sleep disorders, and it may be beneficial for students to be familiar with the content of the questionnaire and how scores are calculated. Being familiar with the questionnaire would allow students to be more aware of warning signs and seek help sooner.

**The Epworth Sleepiness Scale (ESS).** It may also be valuable for students to be aware of the usage and purpose behind the ESS (see Figure 2). The ESS is used to evaluate daytime sleepiness as a predictor for certain sleeping disorders (Johns, 1991). The questionnaire assesses the individual’s likelihood of falling asleep in several everyday situations involving little movement. Asking the likelihood rather than the incidence of falling asleep in each
situation is meant to control for the variance in an individual’s daily schedule. The composite scores fall between 0 and 24 and denote overall sleepiness. A sleep score of 16 signifies a high level of daytime sleepiness and can be used in the process of diagnosing narcolepsy, hypersomnia, and severe sleep apnea. ESS scores alone are not strong enough to give a certain diagnosis, but they can be used as indicators (Johns, 1991). Due to the usefulness of the ESS in addressing daytime sleepiness, it may be helpful for students to understand and evaluate the situations that can be predictors of sleep disorders. This may encourage them to ask a professional to administer the questionnaire when they suspect any form of disordered sleep.

Promoting Healthy Habits

Proper sleep education could greatly improve both academic success and overall quality of life in college students (Thomas, 2015). It is the responsibility of the student to develop and maintain healthy habits, but that can be difficult when they are not educated on the matter. Although the public’s lack of knowledge or acknowledgment of the sleep issue in current society is distressing to consider, it presents the opportunity for collegiate institutions to fill the educational gap. Universities are not encouraged to make large-scale policy or curriculum changes that would affect class times or deadlines, as this may not be useful for every student (D. Kay, personal communication, February 21, 2017). Alternatively, institutions should focus on enlightening students; students should be made aware of the dangers of sleep deprivation and how to prevent it. Once students have been provided with the necessary information, it becomes their responsibility to implement changes on an individual level.

Conclusion

Sleep deprivation is a growing epidemic that is plaguing society, and yet lacking sufficient recognition. Reduced sleep negatively affects physical growth and recovery, and cognitive functioning (Alhola & Polo-Kantola, 2007). It can lead to serious physical and mental health issues, including breast cancer, cardiovascular disease, PTSD, depression, and eating disorders (Jarcho et al., 2013). Collegiate settings usually represent the first opportunity for students to have full control of a lifestyle fraught with responsibilities, and given the current society, it is no surprise that college students often view sleep as unimportant: it is viewed as less important than work, school, or extracurricular activities. This view is counter-productive, because sleep loss impairs an individual’s ability to perform at full capacity in any setting. Individuals who get the proper sleep quality and amount will tend to perform better in all endeavors.

Students and universities can address the growing issue of sleep deprivation by working together to spread awareness of proper sleeping habits and then implementing them on an individual level. Institutions across the nation, and even worldwide, should not be encouraged to make changes in schedule or policy such as earlier/ later class times or deadlines, because it would be difficult to make an adjustment that would be beneficial for all students (D. Kay, personal communication, February 21, 2017). Instead, universities should implement and encourage proper education on healthy sleep habits. For example, BYU has numerous resources that can be utilized to educate students and to set an example for other institutions to follow. BYU has a wealth of knowledge contained in its library, online databases, and faculty. If students and faculty members at BYU make a collective effort, they could greatly impact the growing epidemic of sleep loss at BYU.

In addition, the Counseling and Psychological Services (CAPS) office at BYU houses a Student Outreach Council that works to promote the services offered and to provide training presentations on various issues that college students face such as depression, anxiety, eating disorders, and stress. BYU should utilize this council to spread proper sleep education through smaller trainings or formal classes. The Outreach Committee on the council has compiled many presentations from visiting professors and university faculty that they can present to students. Many of the faculty members at BYU have a long history of research and
could assist in creating a sleep presentation or training that could be distributed on a large scale by the outreach committee. It is worthwhile to educate students, as it could improve academic performance and quality of life. This could be the start of a necessary revolution in the way society views the importance of sleep.

References


Appendix

Pittsburgh Sleep Quality Index (PSQI)
Name_______________________ ID # __________________
Date __________ Age _______

Instructions:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed at night?
   USUAL BED TIME __________________

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
   NUMBER OF MINUTES _________________

3. During the past month, when have you usually gotten up in the morning?
   USUAL GETTING UP TIME _________________

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)
   HOURS OF SLEEP PER NIGHT _________________

   For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you...
   (a) Cannot get to sleep within 30 minutes
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (b) Wake up in the middle of the night or early morning
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (c) Have to get up to use the bathroom
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (d) Cannot breathe comfortably
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (e) Cough or snore loudly
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (f) Feel too cold
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (g) Feel too hot
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (h) Had bad dreams
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (i) Have pain
       Not during the past month ___ Less than once a week ___
       Once or twice a week ___ Three or more times a week ___
   (j) Other reason(s), please describe _____________________

   How often during the past month have you had trouble sleeping because of this?
   Not during the past month ___ Less than once a week ___
   Once or twice a week ___ Three or more times a week ___

6. During the past month, how would you rate your sleep quality overall?
   Very good _____
   Fairly good _____
   Fairly bad _____
   Very bad _____
7. During the past month, how often have you taken medicine (prescribed or “over the counter”) to help you sleep?
   - Not during the past month ___  Less than once a week ___
   - Once or twice a week ___  Three or more times a week ___

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
   - Not during the past month ___  Less than once a week ___
   - Once or twice a week ___  Three or more times a week ___

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
   - No problem at all _____
   - Only a very slight problem _____
   - Somewhat of a problem _____
   - A very big problem _____

10. Do you have a bed partner or roommate?
    - No bed partner or roommate _____
    - Partner/roommate in other room _____
    - Partner in same room, but not same bed _____
    - Partner in same bed _____
    - If you have a roommate or bed partner, ask him/her how often in the past month you have had...

   (a) Loud snoring
    - Not during the past month ___  Less than once a week ___
    - Once or twice a week ___  Three or more times a week ___

   (b) Long pauses between breaths while asleep
    - Not during the past month ___  Less than once a week ___
    - Once or twice a week ___  Three or more times a week ___

   (c) Legs twitching or jerking while you sleep
    - Not during the past month ___  Less than once a week ___
    - Once or twice a week ___  Three or more times a week ___

   (d) Episodes of disorientation or confusion during sleep
    - Not during the past month ___  Less than once a week ___
    - Once or twice a week ___  Three or more times a week ___

   (e) Other restlessness while you sleep: please describe
    ______________________________
    - Not during the past month ___  Less than once a week ___
    - Once or twice a week ___  Three or more times a week ___

Figure 1. This is the Pittsburgh Sleep Quality Index (PSQI) which can be used to evaluate overall sleep quality. This table was retrieved from the questionnaire given in “The Pittsburgh Sleep Quality Index: A New Instrument for Psychiatric Practice and Research,” by D. J. Buysse, C. F. Reynolds, T. H. Monk, S. R. Berman, and D. J. Kupfer, 1989, Psychiatry Research, 28(2), 193-213.
The Cognitive Effects of Late Bilingualism on Executive Functions: Lifelong Benefits

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Abstract

Late bilinguals, those who learn a language past the age of six (the critical period for learning a language), are often thought not to benefit much from their language learning in comparison to their early bilingual counterparts (Bialystok, Craik, Green, & Gollan, 2009). A large body of recent research suggests otherwise. Late bilinguals receive the same cognitive benefits as early bilinguals, such as higher levels of executive functions, specifically, benefits in inhibitory control and attentional switching (Grundy, Chung-Fat-Yim, Friesen, Mak, & Bialystok, 2017; Vega-Mendoza, West, Sorace, & Bak, 2015). Higher levels of executive functions also assist learners in improving their mental processing and cognitive health over the course of their lifetime. Aging bilinguals have greater cognitive health due to more white and gray matter density (Abutalebi et al., 2015). Highly proficient bilinguals also have more white and gray matter, further suppressing aging (Abutalebi et al., 2015). These processes protect the brain from normal, cognitive aging and lead to later onset of age-related illnesses. These and all other advantages from bilingualism are mediated through the learner’s proficiency and frequent use of the language (Bialystok, Craik, & Luk, 2008). Bilinguals with higher levels of inhibitory control overcome the bilingual disadvantage of decreased lexical access speeds (Vega-Mendoza et al., 2015). The advantages bilinguals have over monolinguals in executive functions develop quite early in language training and then continue to evolve and benefit bilinguals throughout language learning (Bak, Long, Vega-Mendoza, & Sorace, 2016). The continuum of the effects of bilingualism benefits both late and early learners the same (Costa & Gallés, 2014). These conclusions demonstrate the universal advantage of this cognitive exercise.

The Epworth Sleepiness Scale (ESS)

Name: _________________________________________
Date: ________________   Age: ________________   Sex: ________

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation:

0 = would never doze
1 = slight chance of dozing
2 = moderate chance of dozing
3 = high chance of dozing

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chance of dozing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td></td>
</tr>
<tr>
<td>Watching TV</td>
<td></td>
</tr>
<tr>
<td>Sitting inactive in a public place (e.g. a theater or a meeting)</td>
<td></td>
</tr>
<tr>
<td>As a passenger in a car for an hour without a break</td>
<td></td>
</tr>
<tr>
<td>Lying down to rest in the afternoon when circumstances permit</td>
<td></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td></td>
</tr>
<tr>
<td>Sitting quietly after a lunch without alcohol</td>
<td></td>
</tr>
<tr>
<td>In a car, while stopped for a few minutes in the traffic</td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your cooperation.

Figure 2. This is The Epworth Sleepiness Scale Questionnaire which can be used to evaluate daytime sleepiness. This table was retrieved from the questionnaire given in “A New Method for Measuring Daytime Sleepiness: The Epworth Sleepiness Scale”, by M. W. Johns, 1991, Sleep, 14(6), 540-545.
In the past two decades, the scientific community has done extensive research on the effects of bilingualism on the neurological makeup of the brain and cognitive processes (Costa & Gallés, 2014). Since then, the effects of early bilingualism—where both languages are learned before the age of six (the critical period for language learning)—have been well researched (Bialystok, Craik, Green, & Gollan, 2009). Current studies of childhood bilingualism have moved into the area of comparison with other cognitively beneficial activities (Janus, Lee, Moreno, & Bialystok, 2016), while research on late bilingual groups has just started to develop (Cox et al., 2016). In recent years, researchers have increasingly focused on the larger population of late bilinguals, or those who have learned a second language past the critical period. While research has produced some differing opinions, taken as a whole, the research has identified several conclusive advantages and disadvantages of late bilingualism (Costa & Gallés, 2014; Hilchey & Klein, 2011).

Early research into bilingualism proposes that there is an advantageous difference in the executive functions of bilinguals (Green, 1998), and due to this, delays in natural cognitive aging (Abutalebi et al., 2015; Li et al., 2017). Some studies have since countered Green’s (1998) findings, showing that these advantages in executive functions are either inconsistent (Hilchey & Klein, 2011), disadvantageous (Costa & Gallés, 2014), or nonexistent (Paap & Greenberg, 2013). These researchers argue that studies that have proposed a bilingual advantage have overlooked factors other than bilingualism that would lead to increased executive functions (Costa & Gallés, 2014; Paap & Greenberg, 2013). Due to the near impossibility of completely controlling variables such as second-language (L2) proficiency and age of acquisition, Paap and Greenberg (2013) acknowledge the difficulties with bilingual research that would lead to inaccurate results. They further suggest that researchers’ conjecture that the advantages are due to bilingualism may be due to the researchers’ lack of controlling for outside variables, individual differences among test subjects, and the researchers’ disregard of the fact that all interactions require monitoring, switching, and inhibitory control (Paap & Greenberg, 2013). Paap and Greenberg (2013) argue that individual differences such as processing speed, working memory capacity, and cultural differences can produce drastic effects on executive processing. While these studies have introduced important weaknesses in the argument of bilingual advantages, they have not addressed the rather consistent findings in studies that used their same procedures, used imaging technologies, and controlled for individual differences.

Other studies demonstrate that there is an advantage for late bilinguals in executive functions, inhibitory control, and attentional switching, due to constant dual language activation, inhibition, and disengagement (e.g., Bak, Long, Vega-Mendoza, & Sorace, 2016; Fernandez, Tartar, Padron, & Acosta, 2013; Grundy, Chung-Fat-Yim, Friesen, Mak, & Bialystok, 2017). These studies offer consistent evidence for a bilingual advantage in the late bilingual population by using many of the same tests and measures: the Simon task (Cox et al., 2016), flanker task (Grundy et al., 2017), picture naming tasks (Janus et al., 2016; Misra, Guo, Bobb, & Kroll, 2012; Vega-Mendoza, West, Sorace, & Bak, 2015), verbal fluency tasks (Janus et al., 2016; Vega-Mendoza et al., 2015), Stroop task (Heidlmayr et al., 2014), Test of Everyday Attention (Grundy et al., 2017; Vega-Mendoza et al., 2015), and go-no-go trials (Fernandez et al., 2013; Sullivan, Janus, Moreno, Astheimer, & Bialystok, 2014). These tests and tasks present behavioral evidence of a bilingual advantage not limited to linguistic tasks, and even more pronounced in non-linguistic tasks, suggesting further benefits for bilinguals (Sullivan et al., 2014).

In addition, new imaging technologies offer neurophysiological evidence for their claims. Researchers again have replicated and substantiated each other’s claims using electroencephalograms (EEGs) (Fernandez et al., 2013; Grundy et al., 2017; Misra et al., 2012; Sullivan et al., 2014). To control for extraneous variables and discover a causal relationship between increased executive functions and bilingualism, researchers use methods such as pre- and post-tests (Bak et al., 2016; Janus et al., 2016; Sullivan et al., 2014), longitudinal follow-up tests (Bak et al., 2016), and varied treatment and control groups in studies where participants received...
Cognitive Effects of Late Bilingualism

Researchers have pinpointed two areas of bilingual advantage in executive functions: inhibitory control and attentional switching. Bilinguals have an advantage in inhibitory control and attentional switching because one language often has to be consistently ignored in favor of another (Grundy et al., 2017). Those who are more proficient in their second language show higher levels of inhibitory control and attentional switching (Fernandez et al., 2013; Grundy et al., 2017; Vega-Mendoza et al., 2015). In later years, bilinguals show increased cognitive health and white and gray matter volume in the brain, leading to later onset of age-related illness than monolinguals (Abutalebi et al., 2015). Although an early age has been considered to be the factor by which the benefits of bilingualism are accessible, learning a second language has been shown to give late bilinguals similar benefits to those of early bilinguals (Vega-Mendoza et al., 2015). Improvements are seen in executive functions, such as higher levels of inhibitory control and attentional switching due to the need to inhibit the non-target language during language usage. These benefits affect the bilingual throughout their lifetime, from when they start learning a second language and into their cognitive aging. This literature review will discuss the effect of bilingualism on executive functions, including inhibitory control and attentional switching, the timeline of these benefits, and its effect on the aging mind.

Executive Functions

Executive functions are the mental processes by which we sort through information from our interactions and environment. Of executive functions, Fernandez et al. (2013) say, “Successful interaction with the environment depends on flexible behaviors which require shifting attention, inhibiting primed responses, ignoring distracting information, and withholding motor responses” (p. 330). Bilingualism bears certain advantages and disadvantages for executive functions (Fernandez et al., 2013; Vega-Mendoza et al., 2015). Specifically, the effects of better executive language training (Bak et al., 2016; Grundy et al., 2017, Vega-Mendoza et al., 2015).

Inhibitory Control

Inhibitory control, the mechanism by which our brain ignores irrelevant information, is especially active in bilinguals (Fernandez et al., 2013). Because both languages are always activated in a bilingual’s brain, bilinguals use this mechanism to concurrently speak in one language and ignore the other. This allows for consistent communication in one language while still exercising the ability to switch into the other at any time (Misra et al., 2012).

Due to both languages’ constant activation, a bilingual’s inhibitory control improves as language proficiency increases (Sullivan et al., 2014). Much like a muscle, proficiency in a second language increases inhibitory control. A study on bilinguals in their L2 environment showed that duration of stay in an L2 environment predicted inhibitory control levels (Heidlmayr et al., 2014). More opportunities presented to the bilingual to speak their L2 leads to increased inhibitory control. A study on Spanish learners at a four-year university found that the more advanced fourth year students exhibited higher levels of inhibitory control than the first year Spanish learners due to their higher proficiency and increased opportunities to switch between languages (Vega-Mendoza et al., 2015). Also, as bilinguals’ languages become more balanced, they compete more often for usage. Because more proficient bilinguals can express themselves in both languages equally as well, they develop better inhibitory control (Fernandez et al., 2013). Thus, proficiency and frequency of use influence and increase with each other. As bilinguals use their language more, their proficiency will increase and that in turn will increase their inhibitory control. As their proficiency grows, their languages will become more equal and compete for more usage, increasing inhibitory control during the lifelong process of language training.

Increased inhibitory control seems to moderate decreased
lexical retrieval speeds compared to monolinguals, a common disadvantage for bilinguals (Costa & Gallés, 2014; Bialystok et al., 2008). Slower lexical retrieval speed in bilinguals is thought to be due to their smaller vocabulary sizes (Bialystok et al., 2008; Giezen & Emmorey, 2017). Early bilinguals split their vocabulary during development between their languages, consequently having a smaller vocabulary in both languages than would a monolingual in their one language. This smaller vocabulary size slows the retrieval of words in verbal tasks (Bialystok et al., 2008; Giezen & Emmorey, 2017). However, a recent experiment on ASL-English bilinguals suggests another reason for this disadvantage. As ASL-English bilinguals (bimodal bilinguals) have the same vocabulary size and consistently use both languages at the same time and in the same environment, there must be another reason why even bimodal bilinguals perform poorly on verbal fluency tasks in their dominant language compared to the monolingual counterparts (Giezen & Emmorey, 2017).

However, rather than vocabulary size, inhibitory control and proficiency levels are more predictive of lexical retrieval speeds. Bialystok et al. (2008) propose this idea in their study of unimodal bilinguals. Bilinguals with a large vocabulary size had faster lexical retrieval speeds than smaller vocabulary size bilinguals (Bialystok et al., 2008). However, once vocabulary size was controlled, the highly proficient bilinguals outperformed both of the other populations, monolinguals and less proficient bilinguals, on the letter fluency task which required more inhibitory control (Bialystok et al., 2008). This was attributed to the higher inhibitory control and better executive functions seen in more proficient bilinguals (Bialystok et al., 2008). Thus, lexical retrieval speeds can be improved as proficiency is improved due to higher levels of inhibitory control.

**Attentional Switching**

Related to inhibitory control is the mechanism of attentional switching. Attentional switching is the disengaging of attention from one stimulus to the next (Grundy et al., 2017). The differences between bilinguals and monolinguals in attentional switching are seen as early as infancy (Costa & Gallés, 2014; Grundy et al., 2017). While 8-month old infants raised in bilingual settings outperform monolingual infants on executive function tasks, through rapid attentional switching, they accrue increased executive functions, such as tracking relevant information and inhibiting responses to non-relevant information (Costa & Gallés, 2014; Grundy et al., 2017). Much the same as the other benefits of bilingualism, this increased attentional switching is seen in older bilingual populations as well (Grundy et al., 2017).

In adults, more efficient processing is the evidence of attentional switching. Bilinguals are able to disengage from previous information to perform better on behavioral tasks (Bak et al., 2016; Grundy et al., 2017; Vega-Mendoza et al., 2015). In response to Paap and Greenberg’s (2013) claim of no advantageous benefits of bilingualism, Grundy et al. (2017) provide electrophysiological evidence of an advantage in attentional switching. Compared to bilinguals, monolinguals had a delay in their processing of tasks due to neural activity still concentrated on the previous task (Grundy et al., 2017). Learning a second language allows bilinguals to disengage from previous information faster, leading to more efficient processing than monolinguals. This is thought to be because bilinguals develop better attentional switching and processing due to consistent language exposure and filtering (Grundy et al., 2017). Further, Vega-Mendoza et al. (2015) propose that higher performance on attentional switching behavior tasks could be mediated by language proficiency levels. Thus, bilinguals develop increased attentional switching with proficiency and frequency of language exposure.

**Timeline of Effects**

Recent research has demonstrated that the effects of bilingualism on executive functions may be more widespread in their influence on different age groups (Vega-Mendoza et al., 2015) and earlier in their onset in language training than previously believed (Bak et al., 2016; Janus et al., 2016; Sullivan et al., 2014).
The effects of bilingualism are much the same in childhood as they are in adulthood—decreased lexical access speed and improved executive functions (Costa & Gallés, 2014; Vega-Mendoza et al., 2015)—and they pose to benefit the language learners throughout their life (Sullivan et al., 2014). These discoveries have led to a series of studies focusing on the onset of the effects of bilingualism and the effects of bilingualism on the aging mind.

Onset of Effects

The effects of bilingualism on executive functions are visible early in the language learner’s training. Studies of early language learning find that even a small period of language training leads to benefits that can become lasting improvements if maintained (Bak et al., 2016; Sullivan et al., 2014). Improvements in inhibitory control in the adult populations have been shown to appear after 6 months of starting to learn a new language (Sullivan et al., 2014). After completing a first-year Spanish course, students performed better than control students and increased their original scores on tasks requiring inhibitory control (Sullivan et al., 2014). These effects were seen on linguistic and non-linguistic tasks, demonstrating the domain-general application of bilingualism. Sullivan et al. (2014) suggest that bilingualism involves a continuum upon which the effects are accessed by learners at different stages of development and proficiency in the language. Thus, as learners become more proficient bilinguals, they will show more benefits in their executive functions.

For attentional switching, increased performances have been seen after even shorter periods of time than 6 months. In a study on children, researchers investigated a proposed similarity drawn between the early stages of learning a language and music (Janus et al., 2016). While both populations improved their executive functions, after just 20 days, the children learning French showed improvements in attentional switching over the children receiving music lessons (Janus et al., 2016). This study suggests that language learning can be a powerful promoter of higher level cognitive processes within a short time frame. In another study, after just one week of an intensive Gaelic course, participants demonstrated improved attention switching on a clinical attention test and other attentional tasks (Bak et al., 2016). Additionally, Bak et al. (2016) found that participants who practiced the language even after the course showed still-increasing improvement after nine months. This corroborates Sullivan et al.’s (2014) perception of the continuum of the effects of bilingualism. Together these studies suggest that the effects of bilingualism can begin quite soon after starting to learn a language and continue to grow as learners increase in proficiency.

Benefits in Cognitive Aging

The effects of bilingualism, namely improved executive control, lead to better cognitive health (Abutalebi et al., 2015; Anderson, Saleemi, & Bialystok, 2017; Bak et al., 2016; Costa & Gallés, 2014; Kousaie & Phillips, 2017; Li et al., 2017). While these benefits are seen concurrent with language learning, they also appear to affect the brain after language learning has stopped in the later years of life. Bilingualism is a form of mental exercise that staves off cognitive aging by performing a neuroprotective function (Li et al., 2017) and increasing white (Costa & Gallés, 2014) and gray matter density (Abutalebi et al., 2015).

In maintaining cognitive youth, consistently doing new and difficult cognitive activities promotes the formation of new neural pathways (Bak et al. 2016). The novelty associated with the activity forges more neural connections and the practice will extend and increase the benefits of the activity (Bak et al., 2016). Bilingualism proves to provide all the necessary steps to delay cognitive aging. In their study on aging bilingual adults, Kousaie and Phillips (2017) found that, compared to their previous studies involving young adult bilinguals, aging bilinguals significant differences from their monolingual counterparts. Electrophysiological results show bilinguals had faster reaction times and quicker conflict resolution (Kousaie & Phillips, 2017). Therefore, as bilinguals age, their cognitive abilities diverge and increase from those of monolinguals of the same age, economic, and educational circumstances. This is due to a cognitive defense built up in bilinguals; their language
practice and abilities protect against natural aging. By participating in the challenge of learning a language, bilinguals decrease the effects of aging. They create a cognitive reserve, a resistance to damage and aging that protects cerebral structures. Across all populations there are certain factors that create this cognitive reserve and therefore decrease cognitive aging, which include educational and occupational levels and avocations (Abutalebi et al., 2015). Abutalebi et al. (2015) advocate that bilingualism also contributes to one’s cognitive reserve. Constantly exercising control over two languages increases executive functions, which in turn decreases the onset of aging (Abutalebi et al., 2015; Li et al., 2017). Aging bilingual adults experience slower cognitive decline, which delays dementia, Alzheimer’s disease, and other cognitive impairments (Abutalebi et al., 2015; Anderson et al., 2017; Li et al., 2017). Bilinguals were also shown to develop dementia symptoms 4 years later than monolinguals (Li et al., 2017). This delay in age-related illness is due to increased white and gray matter density in bilinguals. In highly proficient bilinguals, white matter tracts are more intact than in monolinguals (Costa & Gallés, 2014). Additionally, two separate studies using imaging technologies demonstrate that in bilinguals, gray matter volume is significantly greater than in monolinguals due to improved executive functions (Abutalebi et al., 2015; Li et al., 2017). As the proficiency level and frequency of language usage increases in bilinguals, they become more efficient at inhibiting and switching between their languages. This experience over a bilingual’s lifespan leads to higher white and gray matter density and protects against aging.

**Conclusion**

The effects of bilingualism on cognition, seen in executive functions, onset early in language learning and combat the effects of cognitive aging. These effects are mostly advantageous for bilinguals, with the common disadvantages being easily minimized with increased proficiency (Bialystok et al., 2008). Proficiency and frequency of use cooperatively influence each other and the effects of bilingualism on cognition (Fernandez et al., 2013; Grundy et al., 2017; Vega-Mendoza et al., 2015). As late bilinguals develop language proficiency and use the language more often, they increase their capacity of executive functions, reduce disadvantages, and delay the onset of aging (Abutalebi et al., 2015; Li et al., 2017). These effects are quite similar to those of early or balanced bilinguals (Vega-Mendoza et al., 2015). Like early bilinguals, late bilinguals develop increased executive functions—which begins early in language acquisition—and experience slower cognitive aging. Despite previous criticism (Paap & Greenberg, 2013), recent studies consistently show that the influence of bilingualism continues to benefit learners in increasingly diverse ways that researchers are only now beginning to comprehend. Further longitudinal research is needed to better provide evidence of the benefits along the lifelong process of learning a language. Coupled with experiments using imaging technologies, longitudinal research could assess how the cognitive benefits of bilingualism affect the daily life of bilinguals and their eventual aging process.

**References**


School of Rock: The Relationship of Music Training on Academic Achievement

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Abstract

Music education has been a key part of human culture for thousands of years (Cartwright, 2013). As children often begin to receive musical education during grade school, many researchers have begun to investigate whether musical training may benefit other areas of academics. This literature review evaluates the overall effectiveness of musical training on academic performance for three different age groups: pre- and elementary school children under 12 years old; middle and high school-age adolescents between 12 and 18 years old; and college and university students over 18 years old. Musical training here includes instrumental and vocal training, as well as instruction in musical theory. Various studies indicated that children and adolescents who received music training had higher academic achievement (Wetter, Koerner, & Schwaninger, 2009). In addition, college-age adults who had received music training in college exhibited better memory, which in turn can bring about better academic achievement (George & Koch, 2011). Being able to show that musical training does in fact correlate with an increase in academic performance would be useful for governments in deciding how much emphasis to place on music programs. In addition, parents would be able to better evaluate the benefits of enrolling their children in private music lessons.

Although much research has been conducted on musical training and academic performance, these studies have tended to focus on specific age groups and their performance in specific subjects (e.g. how piano lessons affect math scores of second-graders). This paper will address the effects of musical training on a broader scale by analyzing how musical training affects academic achievement for different age groups. Studying how musical training relates to the academic performance of different age groups...
sheds light on the timing and magnitude of these effects. This literature review will evaluate the overall effectiveness of musical training on academic performance for three different groups of people: young and elementary school-age children, middle and high school-age adolescents, and college and university students.

Literature Review

For the purposes of this literature review, young and elementary school-age children will be anyone under the age of 12, middle and high school-age children will be anyone between the ages of 12 to 18, and adults will be anyone 18 years of age or older. The studies referenced in this review examine groups from different countries around the world.

Elementary School-age Children

Children often have their first encounters with music training in a formal private setting or in elementary school. As most children in the United States are capable of receiving some form of formal music training by age five, formal private lessons are often initiated by parents who desire that their children learn to play an instrument from a young age (Cutietta, 2016). Many parents believe that placing children in music lessons may help them develop positive characteristics, one of which is improved academic performance (Dai & Schader, 2001). If a child can begin receiving music training at such a young age, then the academic benefits of such training may be present early in the child’s life as well.

Multiple studies have found that when controlling for differences in intelligence, as well as parents’ income and educational level, there was an increase in overall academic performance in musically trained elementary school-age children (Schellenberg, 2006; Wetter et al., 2009). Comparatively, other nonmusical out-of-class activities, such as sports and clubs, did not have similar associations with academic performance (Schellenberg, 2006). These studies demonstrate that there is something special about musical training that is may be more beneficial for academic performance than other extracurricular activities. When this training is continuous, the child’s levels of academic achievement tend to remain high over time (Wetter et al., 2009). It can therefore be advantageous to place one’s child in music education programs early on.

Although music training clearly has general benefits to children’s academic success, music training may also advantageously affect specific subjects. For example, whether music training leads to better math scores in young children has been widely debated. Costa-Giomi (2004) found that piano instruction in fourth-graders did not affect academic achievement in math, but a course in non-instrumental music training (NIMT)—including vocal training and music theory—did help children improve their math scores (Ribeiro & Santos, 2017).

What might account for this difference is that Costa-Giomi (2006) studied low-income children with no piano at home. Although the study was conducted over an extended period of time (three years), the fact that these children did not have a means to practice and develop their abilities outside of a classroom setting could have inhibited their musical development. This lack of musical development could have, in turn, prevented them from experiencing the academic benefits of continuous musical training (Wetter et al., 2009). The children, in this case, may have been taught memorization, instead of musical principles. In contrast, the study conducted by Ribeiro and Santos (2017) had more immediate effects. The children in the study were divided into two groups: those with low achievement in math (Group 1) and those with normal math scores (Group 2). By the end of the NMIT, the number of students in Group 1 decreased drastically. The researchers hypothesized that this difference resulted from students having to become conscious of musical principles and not just memorize movements (Ribeiro & Santos, 2017). This study provides an interesting comparison with the study performed by Costa-Giomi (2006). The piano instruction in Costa-Giomi’s study may not have been as effective at teaching musical principles, whereas the NMIT training emphasizes only those principles and not how to play an instrument. The
Music training and academic achievement vary across different age groups. Childhood music lessons can improve academic achievement. Schellenberg (2006) found that concurrent student engagement in academic and musical courses helps students gain the tools to succeed in other areas. In other words, children who come to school with musical experience and training before entering grade school may do better at school. Students who continue musical learning beyond their pre-K-12 schooling will continue to grow and succeed academically.

Middle and High School-age Adolescents

As previously established, it is possible that the skills developed in music classes may be evident and even increase as a child learns and grows. Adolescents who are musically active have significantly higher grades than their counterparts (Hille & Schupp, 2015). In addition, adolescents who also study music tend to maintain higher and more consistent levels of academic achievement (dos Santos-Luiz, Mônico, Almeida, & Coimbra, 2016). This study demonstrates that the correlation between music training and better academic performance may persist even as children get older.

It is important to consider that as children enter middle and high school, they are permitted to choose from a variety of classes instead of having schedules assigned to them. One study found that students who elected to take music courses performed better in most school subjects than those who did not take music courses (Cabanac, Perlovsky, Bonnot-Cabanac, & Cabanac, 2013). Although the relationship between choosing music courses and earning better grades is not necessarily a causal one, it can indicate an important connection between musical students and high academic achievement. Additionally, music classes provide a group atmosphere where social networks can be created, giving the students a more positive school experience.

Besides scholastic K-12 school music education, many adolescents are involved in private music lessons. Private lessons may have an even greater effect on adolescents because of their more individual and specialized nature. A study by Cheek and Smith (1999) indicated that eighth-grade students who took private lessons performed better in math than eighth-graders who had music instruction in school. Because one-on-one instruction can be more focused than group instruction, students who take private lessons could advance further in their music education. Deg, Wehrum, Stark, and Schwarzer (2014) observed that private lessons may allow adolescents to become more confident in their newfound musical knowledge, and in turn, develop an improved academic self-concept. Given that a positive academic self-concept may be a predictor of academic success (Ghazvini, 2011), private music lessons may help students perform better academically.

College and University Students

A continuing examination of music training for college students and their previous musical experiences may give further insight into how extensive long-term music training can facilitate academic success. Very little has been done, however, to study the direct relationship between music training and academic success for this population. Despite the lack of research in this respect, much has been written about how cognitive abilities affect academic achievement in college students. Since better cognitive abilities are associated with increased academic performance (Rohde & Thompson, 2007), measuring the cognitive abilities of musicians versus non-musicians can help in the analysis of the relationship between music training and academic success.

Cognitive abilities can be measured in many ways, but one of the most common forms is by examining memory. Brandler and
Rammsayer (2003) found that musicians (all of whom had academic degrees in music and had been studying music for 14 years or more) scored higher on verbal memory tests than their counterparts who did not have musical experience. In an academic setting, verbal memory would be useful to a college student trying to recall historical facts from a textbook or something that a professor said in a lecture. Increased verbal memory resulting from long-term musical training could potentially lead to greater ability to recall learned information, which in turn can lead to higher academic performance (Rhode & Thompson, 2007).

Music training may be associated not only with verbal memory, but also working memory. Since a greater working memory capacity can help people stay focused for longer periods of time (De Dreu, Nijstad, Baas, Wolsink, & Roskes, 2012), a strong working memory could prove to be especially useful in an academic setting. One study by George and Coch (2011) of undergraduate students at a college in the Northeast United States researched working memory in musicians and non-musicians. In the study, “musicians” were considered people who had played an instrument since they were 10 years of age or younger, and had continued playing the instrument consistently until the time of the experiment. The researchers found that musicians had better auditory and visual working memory than non-musicians. Musical training over the course of a student’s life can positively affect the student’s cognitive abilities, and these cognitive abilities contribute to the academic success of college students in the forms of memory recall and attention span.

**Conclusion**

This literature review analyzed the relationship between music training and academic performance. The analysis of the literature was presented in three groups: elementary school-age children, middle and high school-age adolescents, and college-age adults. In younger children, music training contributed to an increase in academic performance (Schellenburg, 2006). Music lessons place children in an academic setting that is familiar, enjoyable, and entertaining early in their lives, which could increase their desire to learn other subjects in school. In addition, the skills acquired in music training programs may transfer over to other school subjects. When children grow into adolescents, the relationship between music training and important aspects of academic performance (such as memory and comprehension) is also present (Cabanac et al., 2013). Private music lessons may also magnify this effect in adolescents. Finally, as students reach the college and university stage of their lives, music lessons have been correlated with an increase in memory, which is related to higher academic achievement (Brandler & Rammsayer, 2003).

Since there seems to be a positive relationship between music training and academic performance, research on more specific aspects of this idea would be useful to the academic community. Studies that examine which instruments or types of music training have the greatest effect on academic performance would be especially impactful. In addition, how long one must receive musical training in order for the training to influence academic performance would contribute to the knowledge of this field.

This literature review provides support for the argument that music training does strengthen students in nonmusical subjects. It is important for parents, teachers, and government officials to be aware of this association. If music education programs are sacrificed to elevate other subjects, there may be a negative effect on children’s performance in those other subjects. Encouraging children to study music, both inside and outside of a school setting, is an important part of education at all levels of schooling.

**References**


Brandler, S., & Rammsayer, T. H. (2003). Differences in mental abilities...


Rohde, T. E., & Thompson, L. A. (2007). Predicting academic achievement with cognitive ability. *Intelligence, 35*(1), 83–92. doi://dx.doi.org/10.1016/j.intell.2006.05.004


Cultural Influence on Regulating Emotion

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Abstract

Emotional regulation is an important aspect of our social lives that can build or weaken relationships. Regulating emotion is influenced by many important factors, one of which, culture, has a striking influence on how people regulate their emotion. The world can be divided into two major types of cultures: independent and interdependent culture. Most Western countries show characteristics of independent culture while most Eastern countries show the characteristics of interdependent culture. Depending on what culture we are from, we will exhibit differences in emotion regulation on behavior and emotional coping strategies. Thus, understanding cultural differences is especially crucial when delivering or communicating thought and emotions, so the audience will interpret them correctly. How we regulate emotion will ultimately vary between individuals, but culture can help predict the norms of how a group of people perceives their environment as it pertains to regulating emotion.

Keywords: emotional regulation, independent culture, interdependent culture

Being conscious of oneself, or knowing how one controls and expresses his or her emotions, is essential in an individual’s life (Tugade & Fredrickson, 2007; Vandervoort, 2006). Regulating emotion is one of the most important tasks individuals have when engaging in social interaction. For example, being understanding of others can help develop a relationship, while an inappropriate outburst can weaken it (Lopes, Salovey, Côté, Beers, & Petty, 2005). Thus, emotion regulation plays an important role in how individuals function in society, especially in acts such as communicating and connecting with others (Lopes et al., 2005). However, because each person’s perceived experience with emotion is different, each individual might respond differently to the same situation. Religious backgrounds, social expectation, cultural influence, and many other factors can affect how one responds (Hochschild, 1979).

Among many factors that can influence emotion regulation is culture. Different types of cultures, such as independent and interdependent cultures, carry different definitions of the self and of others; these definitions are also known as self-construals (Markus & Kitayama, 1991). Therefore, culture influences individuals’ experience, including cognition, emotion, and motivation, by providing meaning to the individual themselves, and also by providing necessary coordination and organization to its community (Markus & Kitayama, 1991; Matsumoto, 2007). Thus, culture shapes how people perceive events in their life and guides expression of one’s emotion (Matsumoto, 1993; Soto, Levenson, & Ebling, 2005). Herein, understanding one’s own culture and others may be able to reduce conflicts and help regulation of emotion.

Despite differences in culture, people from most cultures generally agree on what is morally right or wrong. However, people’s perception of an event’s significance, as well as what is proper emotional behavior at such an event, differs depending on their backgrounds (Parrott, 1993; Tamir, 2009). Different cultures result in different sets of emotional control methods and different schools of thought as to how one should perceive their experience (Mesquita & Ellsworth, 2001; Miyamoto & Ryff, 2011).
While individuals may express their emotions slightly different from the cultural expectation, culture is a good indicator for evaluating people within the culture (Allen, Diefendorff & Ma, 2014).

This literature review will discuss theories of why and how culture shapes people, and specifically, how people from independent and interdependent cultures regulate their own emotions; it will seek to do so by comparing and contrasting Eastern and Western societies. Additionally, gender differences in regulating emotion across cultures will be discussed. Synthesizing the research on cultural causes of emotional regulation is needed to broaden our understanding of how people regulate emotions differently. This article will seek to do so, while also highlighting variations of emotional control schemes and methods between cultures.

Cultural Influence in Our Lives

Evolutionary psychology and the environment of evolutionary adaptiveness give a brief view on how culture developed over time to fulfill basic human needs, such as eating, drinking, breathing, sleeping, shelter, sex, and other elements that keep the human race alive and reproducing (Matsumoto, 2007; Sheldon, 2004). To achieve these needs, people started to form groups to protect themselves from danger, find a mate, and raise children safely (Buss, 2001). The population of these groups started to grow as the group was able to successfully protect themselves from other forces. Soon, systems and rules were needed to prevent chaos and to allow society to function more efficiently. As they organized their own society, their systems—or their culture—were passed down or shared from generation to generation, giving a meaning to the system that provides all basic needs and meaning in life (Matsumoto, 2007).

As a person is raised in a specific culture, he or she learns how to act and express his or herself according to each situation, relationship, or context, and this can start to be learned at as soon as 16 months old (Bell & Calkins, 2000; Volling, McElwain, & Miller, 2002). Thus, a person from one culture can have an entirely different understanding of what is expected from another’s point of view. For example, one of the common medical practices in Eastern culture, acupuncture, may seem threatening to a Western patient, while it is a completely normal medicinal practice for an Eastern patient. In a similar manner, culture—or the creation of social order, rules, and guidelines—motivates people to regulate their emotion and behave as they should (Hochschild, 1979; Keltner, Ekman, Gonzaga, & Beer, 2003; Markus & Kitayama, 1991; Matsumoto, 2007). This makes culture a key factor in studying how people regulate emotion.

Independent vs. Interdependent

Markus and Kitayama (1991) proposed that there are two types of cultures throughout the world: independent cultures and interdependent cultures. A sizable segment of the United States and many Western European cultures fall into independent cultural systems, while most of Asian, African, Latin American, and many southern European cultures fall under interdependent cultural systems. Even though these two cultural systems are exhibited in many countries, this article will compare and contrast the United States and European independent countries to Eastern Asian interdependent countries.

Independent culture, also known as individualism, comes from the idea that individuals are independent from each other (Oyserman, Coon, & Kemmelmeier, 2002). Independent culture maintains that an individual’s unique inner attributes and values have distinctive, personal opinions and attitudes. Individuals feel less responsibility, duty, or loyalty for the group in this kind of culture. In contrast, interdependent culture, also known as collectivism, values connection between individuals by emphasizing attendance, focus towards others, fitting in, and being harmonious with the people in the community (Oyserman et al., 2002).

These systems can be found in everyday life, even in situations such as parents having dinner with their children. A typical parent from the United States, or a parent from any other primarily individualistic culture, might say, “Think of the starving kids in Ethiopia, and appreciate how lucky you are to be able to eat this
Cultural Influence on Regulating Emotion

When deep acting was used, there was a negative correlation in the U.S. population, while no significant increase was shown in the Chinese sample. As a result, this study showed how people perceive and understand their circumstances differently, and how that understanding ultimately resulted in different behaviors. An extensive study that included 6,048 responses from 33 countries also found a positive association of individualistic countries with negative emotions toward being in groups. However, people in independent culture countries were also positively correlated with happiness and surprise (Matsumoto, Yoo, & Foontaine, 2008). These results suggest that people’s stress levels and efficiency can increase and decrease in different situations, depending on their culture.

Cause of Emotional Regulations

Culture influences how people perceive the self and others, resulting in different perspectives and behaviors (Markus & Kitayama, 1991). Thus, individualistic and collectivistic cultures have different reasons for why they would regulate their emotion in certain situations or places. People generally enjoy feeling positive emotions, but, depending on an individuals’ situation, they sometimes dampen their positive emotions (Miyamoto & Ma, 2011; Tugade & Fredickson, 2007). Seventy-eight European American undergraduates and 108 Japanese undergraduates were studied to see what caused them to dampen positive emotions. Social concerns, dialectical beliefs, self-efficient tendencies, self-improvement motivation, and interpersonal tactics were each found to influence a person’s emotional dampening (Miyamoto & Ma, 2011).
Cultural Influence on Regulating Emotion

Emotion Regulation Strategies

As mentioned before, regulating emotion is an essential part of our lives (Tugade & Fredrickson, 2007; Vandervoort, 2006). Engagement factors and disengagement factors are some of the basic coping strategies that have been found to regulate one’s emotion, either to be more engaged with or to create distance from others (Tobin, Holroyd, Reynolds, & Wigal, 1989; Carver & Connor-Smith, 2010). In regard to engagement strategies, crafting a background and thinking about victims are two ways that people seem to be encouraged to become engaged emotionally. On the other hand, disengagement strategies have been associated with distancing, denial, deliberate shallow processing, shifting focus, and expressive suppression and masking (Davis et al., 2012; Matsumoto, Yoo, Hirayama & Petrova, 2005).

Not many cross-cultural studies have been done on this topic, but Davis et al. (2012) conducted one of the first cross-national examinations empirically examining whether Eastern and Western cultures differ in emotional intensity and emotion regulation. Over 400 participants from China, Europe, and the United States (including Chinese Americans, Vietnamese Americans, Korean Americans, and Japanese Americans) were studied. As a result, Chinese samples reported higher use of disengagement tactics with less emotional intensity than Americans (Davis et al., 2012).

As we move forward in the study, gender difference is also something that the paper would just touch on but not go in deeply. There are also gender differences in how people regulate emotion across cultures. It is also one of the elements that impacted emotion regulation between female and male. The social norm for men in Asia is to keep their emotion to themselves and to stay calm. For that reason, research has shown that Chinese men use more disengagement strategies to keep them from being too emotionally engaged; likewise, expressing more emotions was the social norm for U.S. women, so they used more engagement strategies (Davis et al., 2012). Eastern Asian Americans show similar results to other Americans; this is important to note in that it supports the idea that culture, not race, seems to have the greatest influence on shaping emotion regulation.
Conclusion

Culture is needed to increase survival and reproduction and to keep the order of a society. Because it is passed down from generation to generation, what people do based on their culture is accepted as a norm. Today, people have started to create personal cultures by having their own Christmas or wedding anniversary traditions, etc., to strengthen relationships with those around them. People learn how to act, feel, and behave through culture, whether it is found in a nation or in a family.

Among the many cultures that around the world, the two major types of culture are called independent culture and interdependent culture. Independent culture is found mostly in Western countries while interdependent culture is mostly found in Eastern countries. Comparing and contrasting people from these two different cultures has yielded very interesting results as to how people regulate emotions. Using reports of individuals’ emotions and how they regulate their emotions, studies have demonstrated significant differences in how people regulate their emotion and behavior depending on which culture they were raised in.

The studies examined in this review acknowledge differences in cultures and how and why people behave differently. They provide general knowledge and brief insights into how individuals from foreign cultures can act, feel, and think differently than what one is used to. Culture is ingrained deeply in everyday life in such a way that individuals often do not recognize it until interacting with someone of a culture different than their own. Understanding what kind of environment an individual grew up in may be able to increase positive relationships and efficiency. This is especially crucial today, since businesses and governments operate globally. However, not enough research has been conducted about how this knowledge can be applied in individuals’ lives. Additionally, cross-cultural studies are sparse, making it difficult to compare and contrast to have a comprehensive understanding. In future investigations, researchers should study how this knowledge can be used to improve the quality of social relationships between people of different nations.

References


Pornography’s Effect on the Brain: A Review of Modifications in the Prefrontal Cortex

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Abstract

Pornography use has exponentially increased in the past 10 years. Most believe pornography use is largely a harmless behavior. Although sexuality is innate, hyper-sexual behavior, such as pornography use, has become increasingly commonplace. Addiction research has found that long-term substance addiction contributes to changes in brain volume (Hong et al., 2013; Zhou et al., 2011). Moreover, recent studies have shown that behavioral addictions promote similar brain volume loss as substance abuse (Hong et al., 2013). Research has shown that the particular area most affected is the prefrontal cortex (Hong et al., 2013). The prefrontal cortex, which oversees regulating self-control, decreases in size when exhibiting addictive behaviors (Hong et al., 2013). The cause of behavioral addictions like pornography addiction comes from prefrontal cortex areas such as the DLPFC, vlPFC, and vmPFC (Zhou et al., 2011). This effect on the prefrontal cortex has been shown to be particularly marked in participants with pornography addiction (Kühn & Gallinat, 2014). Pornography use has been shown to decrease the gray matter of the prefrontal cortex compared to baseline, thereby decreasing decision-making. This impact on the cortices dedicated to decision-making and self-control may contribute to ways in which pornography use can be addictive.

Pornography has gained an ever-increasing influence as society has seen exponential expansion towards the accessibility of sexual content. A developing online community and continuing Internet growth have contributed to a significant increase in access to sexual images, causing sexual images and other forms of media to become ubiquitous (Hilton & Watts, 2011; Sirianni & Vishwanath, 2016). The increase of accessibility to sexual media has led to an increase of sex consumption, creating an environment where pornography is commonplace, and in some cases, addictive (Hilton & Watts, 2011; Sirianni & Vishwanath, 2016). Although sex/pornography addiction is not currently a diagnosis in the DSM-5 (Krueger, 2016), the present review will discuss the research in this domain thus far, primarily discussing the physical brain changes that happen when viewing pornography.

The brain is motivated to seek reward through multiple neurotransmitters, the most prominent being dopamine (DA). However, when addiction takes hold, the brain is rewired to crave the particular behavior instead of natural rewards (Kim et al., 2017). Independent of the individual’s conscious cognitive self-control, addiction routes the part of the brain that is likely to contain self-control, affecting the individual’s power to correctly choose the most beneficial behavior for their life (Hald & Malamuth, 2008; Kühn & Gallinat, 2014). Though an addiction to pornography is rare, considering the millions who have viewed sexual images (Ybarra & Mitchell, 2005), it can be classified as an addictive behavior in which participants have binging and withdrawal cycles and feel out-of-control in their behavior towards cybersex because they are abstaining and then indulging excessively (Ko et al., 2009; Snagowski, Laier, Duka, & Brand, 2016). There are a wide variety of different aspects of Internet sex addiction. These include viewing online pornography, petitioning escorts, videoing webcam sex, and engaging in prostitution (Snagowski et al., 2016). Although all are considered forms of cybersex, the focus of this review will be the behavioral addiction of viewing online pornography.

Although the adverse psychological consequences of pornography addiction have been documented (Bothe, Toth-Kiraly, Demetrovics, & Orosz, 2017; Perry & Davis, 2017; Perry & Snawder, 2017), the physiological effects have been far less researched. Saturation of pornography in society has led many to ignore the negative effects of the addiction (Hald & Malamuth, 2008). Some believe pornography has no long-term physiological effects on the individual, and today’s culture facilitates this belief with the increase of mainstream sexual images in the news, media, and entertainment. The physiological effects of pornography include decrease in brain matter, which may lead to depression and low self-esteem (Brand, Snagowski, Laier, & Maderwald, 2016). Despite documentation of these effects, pornography use continues to increase (Owens, Behun, Manning, & Reid, 2012).

Behavioral addictions, such as pornography addiction, have been studied less than substance addictions (Kühn & Gallinat, 2014; Laier & Brand, 2014). These types of addictions do not involve ingesting a physical substance that affects the body’s natural functions. Nonetheless, recent research shows that behavioral addictions such as viewing pornography and gambling are more similar to substance addictions than previously thought (Kühn & Gallinat, 2014; Love, Laier, Brand, Hatch, & Hajela, 2015). Scientists have researched the physical side effects of pornography consumption and have helped researchers to gain insight into the long-term changes the brain undergoes when looking at pornography (Laier & Brand, 2014; Love et al., 2015). Similarities between pornography and substance addictions are vital to understand to begin to apply substance addiction methods to pornography addiction.

Several studies have shown that behavioral addiction is comparable to substance addictions such as cocaine, methamphetamine, and tobacco use (Goudriaan, De Ruiter, Van Den Brink, Oosterlaan, & Veltman, 2010; Ko et al., 2009). Behavioral addiction has similarities to substance addiction in several ways. One way is that pleasure chemicals in the brain are released in excessive amounts in comparison to natural stimuli. This is akin to the consumption of a physical substance. As more of the substance is consumed, the brain begins to rely on these abnormal amounts...
of neuron-firing to receive the same sensation (Bostwick & Bucci, 2008; Hilton & Watts, 2011). Additionally, individuals who use pornography have shown significant tissue decrease in several parts of the PFC compared with the individual’s baseline, similar to decreases observed in substance abuse (Feil et al., 2010; Zhou et al., 2011). Moreover, the brain becomes rewired to seek reward from the harmful behavioral substance just as it would from a physical substance (Garavan et al., 2000). The individual also does not usually comprehend the magnitude of the effect on his or her lifestyle and behavior when addicted (Hald & Malamuth, 2008).

In evaluating the studies of the areas of the brain affected by addiction, researchers have found the prefrontal cortex to be most affected (Dong, Lin, & Potenza, 2015; Hald & Malamuth 2008; Volkow et al., 2005). The prefrontal cortex (PFC) contributes to several vital functions for an individual. The PFC gray matter correlates with higher operating functions, such as planning complex behaviors, exhibiting self-control, and moderating decision-making, all of which are altered in both substance and behavioral addictions (Dong et al., 2015; Hald & Malamuth 2008; Volkow et al., 2005). Addiction research on the PFC has associated the gray matter of the PFC with the self-control and preference attribution of an individual (Volkow et al., 2005). This research has been highly beneficial in understanding why participants become and stay addicted. In line with this research, the PFC can be affected when watching pornography; the behavior becomes addicting as the part of the brain operating the person’s self-control slowly deteriorates (Sutterer, Koscik, & Tranel, 2015).

Deterioration of the PFC can cause a vicious cycle: the more pornography is viewed, the more the PFC gray matter deteriorates, leading self-control to decay (Kim et al., 2017; Kühn & Gallinat, 2014). This loss of self-control could be why pornography seems to be an addictive behavior. Studies have shown that pornography may be as hard to overcome as any other substance or behavioral addiction (Goudriaan et al., 2010; Kühn & Gallant, 2014). Some research has also been done concerning the brain matter changes that occur before the formation of addiction, but the present article will focus primarily on an individual’s baseline gray matter and gray matter after addiction (Ersche et al., 2012; Kühn & Gallinat, 2014). The decay of gray matter is critical when considering brain changes from viewing pornography. Although some consider frequent pornography use a harmless form of entertainment, pornography addiction can result in physical changes, specifically the shrinking of gray matter, causing a loss of healthy neurons, which diminishes the executive function critical to effective decision-making and self-control. This paper will discuss in detail the similarities between substance and behavioral addictions such as pornography, including the parallels of the addiction cycle, the changes made to the PFC, and loss of self-control as a result of these changes.

The Cycle of Addiction and Its Effect on Substance and Behavioral Addictions

DA is the neurohormone chemical central to addiction: DA increases the rate of neuron firing when a pleasurable stimulus is offered. DA is known as the pleasure neurotransmitter, helping the body receive satisfaction for rewarding activities (Groman & Jentsch, 2012). Natural releases of DA in the brain follow after stimuli such as exercise, consumption of food, and sexual behavior (Groman & Jentsch, 2012; Kim et al., 2017). The chemical DA starts the cycle of addiction by flooding the brain with the feeling of pleasure in response to the addictive behavior. Pornography is a heavily exaggerated version of natural sexual activity and, as such, the brain both outpours more DA than a normal stimulant and creates changes in the neural receptors (Brand et al., 2016; Dong et al., 2015).

The cycle of addiction begins with the PFC craving the desired substance or behavior. Although the brain receives DA from certain natural functions such as food, water, and sex, the manifestation of an addict starts with DA flooding the limbic system with an unnaturally high amount, not allowing the addict to think about much else other than the substance or behavior (Fattore, Melis, Fadda, Pistis, & Fratta, 2010; Georgiadis & Kringelbach, 2012).
This creates a strong motivation for the stimuli and the addict learns to binge on the substance or behavior. When an addict engages in viewing pornography, this may mean that they are in the intoxication phase of the addiction cycle, impairing the addict’s brain from choosing other options (Berridge & Robinson, 2016; Goldstein & Volkow, 2011; see Figure 1).

Loss of self-control has been shown to come from the PFC becoming deactivated when watching pornography (Kim et al., 2017; Kühn & Gallinat, 2014). Following binging behavior, the limbic, or most primitive part of the brain, is satisfied and the PFC is stimulated (Berridge & Robinson, 2016; Hald & Malamuth, 2008). After an individual has gone through this cycle, the PFC will associate this period of withdrawal with increased psychological and physiological stress because of lowered levels of DA (Brand et al., 2016; Dong et al., 2015). This stress can contribute to many side effects, such as depression, grief, feelings of inadequacy, and low self-esteem, leading the participant’s brain to desire an escape from these feelings and to participate in the substance or behavior again (Berridge & Robinson, 2016; Hald & Malamuth, 2008). The cycle of craving, intoxication, binging, and withdrawal indicate reduced self-control (Kühn & Gallinat, 2014; Owens et al., 2012). Pornography users may be disadvantaged when trying to quit because they have lost many synapses in the cortical area of the PFC associated with self-control.

Notably, behavioral addictions such as pornography and gambling addictions generally do not include ingesting physical substances which can be held responsible in determining why the body craves the behavior. Although some uncommon situations can result in pornography addiction, such as when individuals who ingest dopaminergic agonists become more prone to addictive behaviors, a behavioral addiction in an otherwise healthy adult usually is not caused by ingestion of substances (Imamura, Uitti, & Wszolek, 2007). Behavioral addiction is similar to substance addiction, but defined as any behavior, not involving ingestion of a drug, in which an individual compulsively seeks out the stimuli or feeling that arises from that stimuli (Alavi et al., 2012; Owens et al., 2012; Peter & Valkenburg, 2016). Individuals who are addicted to pornography physically crave the behavior, as shown in their cortical changes and their DA levels, and they experience negative consequences from the frequency of the activity overriding other important aspects in their lives (Owens et al., 2012; Price, Patterson, Regnerus, & Walley, 2016).

For substance addictions, such as nicotine, cocaine, and methamphetamine addiction, the literature has shown the potential for the substance to alter gray matter in the brain modules associated with self-control (Goldstein & Volkow, 2011; Goudriaan et al., 2010; Zubieta et al., 2005). Physical substances increase blood flow to the PFC, leading the brain to crave more of the substance (Feil et al., 2010; Voon et al., 2014; Zubieta et al., 2005). Similarly, a surge of regional cerebral blood flow (rCBF) and decrease in gray matter occurs right after the consumption or binging of pornography as well. This continues each time the individual engages in pornography, as the PFC becomes accustomed to the abnormal amounts of rCBF (Goldstein & Volkow, 2011; Zubieta al., 2005). Thus, when the PFC grows accustomed to this abnormal amount of rCBF, it needs the increased amount of rCBF, associated with watching pornography, to satisfy the craving. The individual viewing pornography will rely on this behavior to receive the most blood flow, and can no longer receive the same heightened blood flow from natural activities, such as sexual intercourse (Park et al., 2016; Voon et al., 2014).

Habituation familiarizes the PFC to the drug, causing it to demand more of the addictive behavior in order to achieve the same increased amount of rCBF and to increase chemicals such as DA, the chemical compound thought to be responsible for the propitiation of pleasure (Groman & Jentsch, 2012; Kim et al., 2017). Pleasure is naturally wired to reward biologically necessary functions such as food consumption and sexual activities, but when addictive behaviors increase the DA more than the extent to which the PFC is
When the part of the brain responsible for speech production is lesioned, causing an individual to have full mental capabilities of speech, but speech becomes labored (Fridriksson, Fillmore, Guo, & Rorden, 2015). Thus, certain modules of the brain focus on specific tasks. The specific functioning of brain areas has assisted research surrounding behavioral addictions like pornography. Pornography addiction could affect parts of the brain exclusively responsible for decision-making.

To enumerate, specific tasks dedicated to each area of the brain have been studied extensively in the brains of addicted individuals. Behavioral addiction alters brain functions in several areas. First, addiction tends to decrease gray matter in the PFC—gray matter which is primarily in charge of the self-control and awareness of behavior (Dong et al., 2015; Goldstein & Volkow, 2011). This explains why the addicted individual’s particular behavior is prioritized over all other activities in his or her life (Hong et al., 2013; Volkow & Morales, 2015). Prioritizing an addictive behavior can create harmful situations for the addict. Instead of participating in the most beneficial choice for oneself, the individual will continue to turn to his or her addiction (Groman & Jentsch, 2012; Hong et al., 2013; Kim et al., 2017). In a healthy, un-addicted brain, the individual will choose the most comfortable and pleasurable choice for their lives (Cabanac et al., 2002). Behavioral addiction twists this natural tendency into desiring the addicted behavior instead of desiring vital behaviors (Garavan et al., 2000).

Above all addiction affects the PFC by creating the release of chemical neurohormones, produced by nerve cells and then released into the rCBF (Groman, & Jentsch, 2012; Kim et al., 2017). The brain releases DA when an individual accomplishes instinctively pleasurable actions (Groman, & Jentsch, 2012; Kim et al., 2017). When stimuli that can cause this release of DA are intensified, the brain directs larger quantities of DA towards the addictive behavior (Kim et al., 2017; Kühn & Gallinat, 2014). Over time, the more one consumes amplified, intensified views of sexual activity, the less the brain disperses DA to natural sexual responses found in the physical world (Berridge & Robinson, 2016; Kühn & Gallinat, 2014).
Pornography’s Effect on the Brain

Regions Affected by Pornography Addiction

The PFC has many different regions that may play a role in pornography addiction. Self-control has been shown to stem from the dorsolateral PFC (DLPFC) and the ventrolateral PFC (vLPFC) (Goldstein & Volkow, 2011; Dong et al., 2015). Once the behavioral addiction of pornography has stimulated both the DLPFC and the vLPFC repeatedly, they are more activated by viewing pornography than physical sexual intercourse (Berridge & Robinson, 2016; Kühn & Gallinat, 2014). Once the binge is over, the gray matter in the DLPFC and the vLPFC decrease due to overstimulation wearing on brain structure and deregulation of the PFC (Berridge & Robinson, 2016; Kühn & Gallinat, 2014). This deregulation may affect decision-making and self-discipline, provoking individuals viewing pornography to stay in a cycle of binging and craving because of the decreased gray matter in the PFC (Fecteau, Fregni, Boggio, Camprodon, & Pascual-Leone, 2010; Goldstein & Volkow, 2011).

At the onset, the DLPFC becomes much more activated when an individual views a picture of sexual behavior, as shown in Figure 2 (Brand et al., 2016; Dong et al., 2015; Fecteau et al., 2010). Individuals who do not have an addiction to the behavior have no such activation in the DLPFC; addicts show significant increases. The DLPFC is likely to control the decisions made on a day-to-day basis (Brand et al., 2016; Dong et al., 2015; Fecteau et al., 2010). Thus, when the addiction has significantly rerouted the decision-making DLPFC, participants with addiction have been shown to have substantial increases of attention only when looking at pornography (Dong et al., 2015; Fecteau et al., 2010). The behavior does not have to enter the body or reach the bloodstream, like ingesting a substance, to chemically alter the brain. Accordingly, the behavioral addiction of pornography may be addicting in the same way as a substance addiction. According to studies on the brain, even if the substance does not enter physically into the body, it may have similar effects on the PFC to ingesting the drug (Brand et al., 2016; Dong et al., 2015; Fecteau et al., 2010). For example, cocaine addicts can achieve the same arousal in the brain by viewing pictures of cocaine (Fecteau et al., 2010). This calls for researchers to look deeper into behavioral addiction originating from decreases in gray matter instead of attributing behavioral addictions to a lack of willpower.

When the PFC part of the brain is not fully activated or aware during the phase of intoxication, the body is no longer able to continue to choose the regulation of beneficial behaviors and pursuit of goals (Goldstein & Volkow, 2011). Intoxication increases the likelihood that the participant of the pornography addiction will return to viewing pornography, even if he or she does not have a desire to (Berridge & Robinson, 2016). Their self-control and discipline are more and more inhibited each time they view pornography, leading them to have less control in stopping the pornography addiction (Goldstein & Volkow, 2011).

Gray Matter Decreases in Pornography Addicts

The ventromedial PFC (vmPFC) has been studied extensively in literature and is thought to be related to decision-making (Brand et al., 2016). The vmPFC could contribute to the addiction cycle by becoming dependent on pornography use. When an individual views pornography, decreases in the gray matter of the vmPFC lead to lower self-control (Kim et al., 2017; Kühn & Gallinat, 2014). This, in turn, conditions the vmPFC to respond with high alertness to the viewing of pornography, as seen in Table 1. When the behavioral addiction of pornography use affects the vmPFC, it may lead to impaired thinking, starting the intoxication stage of addiction, where the brain is stimulated by the thought of watching pornography, and the absence of pornography increases this thought until the participant can recognize the viewing of pornography as the logical response to the stimulus (Brand et al., 2016; Yamamoto, Woo, Wager, Regner, & Tanabe, 2015). This conditioning of the vmPFC triggers an undesirable emotion when the participant experiences a stressful situation in which the conditioned response would be to view pornography to ease stress (Yamamoto et al., 2015). The vmPFC has been shown to become narrowly focused on the behavior, allowing the individual to gain DA only from that amplified natural DA-initiating behavior,
interfering with the more subdued environment humans have lived in for millions of years (Cabanac et al., 2002). In our ancestral heritage, human beings had no access to amplified sexual content, and were only stimulated through committing the act of copulation with another human, one of many ways to release DA. Under these circumstances of the vmPFC, the PFC becomes trained to seek out the reward of pornography, as it is now wired to deliver DA to reward centers in the PFC (Hyman, Malenka, & Nestler, 2006).

Having received the increased amount of DA the addictive behavior triggers, the PFC is subdued, but only for a short time until the vmPFC craves the behavior again (Berridge & Robinson, 2016; Fattore et al., 2010). The participant may be able to recognize the impaired impulsivity of their actions at this point, until the decreased brain tissue signals for more stimulation (Hald & Malamuth, 2008). The medial PFC (mPFC) has also been shown to be activated with the vmPFC in other addictions, such as cocaine addiction, to trigger activation when the drug is used, creating the craving effect seen in pornography addiction (Sutterer, Koscik, & Tranel, 2015; Volkow et al., 2005). Increased activation of the mPFC demonstrates that when the mPFC becomes addicted, it has a much higher response to the addicted behavior, showing a link between the craving and the addictive behavior the individual prioritized.

The vlPFC is likely the area of the brain most responsible for regulating adverse risks and stopping high-risk behavior (Hyman et al., 2006; Seok, Lee, Sohn, & Sohn, 2015). The vlPFC exhibits decreased tissue volume and function when participants engage in viewing pornography and does not regulate the risky behavior as it should (Feil et al., 2010; Goldstein & Volkow, 2011; Kühn & Gallinat, 2014). When the regional brain of the vlPFC is deactivated, participants engage in more activities that could be harmful (Seok et al., 2015). In pornography usage over time, the vlPFC decreases in physical size, reducing alertness when engaging in risky activities (Feil et al., 2010; Goldstein & Volkow, 2011; Kühn & Gallinat, 2014). In some studies, decrease of vlPFC gray matter has significantly lessened awareness of the risk involved with pornography (Goldstein & Volkow, 2011; Kühn & Gallinat, 2014); an individual may believe that he or she has control over the addiction and that the adverse side effects are small (Hald & Malamuth, 2008; Yamamoto et al., 2015). The decrease of gray matter in the vlPFC caused by pornography use hinders the ability of the executive functions of the brain to realize the potential adverse consequences and puts the individual into an intoxicated phase (Kühn & Gallinat, 2014).

**Conclusion**

Pornography use affects the executive functions of the brain by rewiring its structure and decreasing gray matter volume (Kim et al., 2017; Kühn & Gallinat, 2014). Societal responses have been less than satisfactory concerning the view of behavioral addictions such as pornography, but research has now shown large correlations between the effects of substance abuse and behavioral addictions (Brand et al., 2016; Dong et al., 2015; Fecteau et al., 2010). Both substance use and behavioral actions create the same reactions in the brain, increasing DA when the addictive substance is encountered; decreasing tissue in the vlPFC, mPFC, and DLPFC; and deactivating tissue likely responsible for the self-control and awareness of the individual (Fecteau et al., 2010; Goldstein & Volkow, 2011).

Regions of the PFC, including the vlPFC, mPFC, and DLPFC have been shown to physically decrease in size with pornography addiction (Fecteau et al., 2010; Goldstein & Volkow, 2011). The decrease in gray matter has been shown to have no long-term effect when a pornography individual breaks the cycle of addiction, and the gray matter of all brain areas increases back to an individual’s baseline gray matter size (Kim et al., 2017; Kühn & Gallinat, 2014). These findings lends hope to individuals with pornography addictions, as the gray matter plasticity can recover and revive its functions strongly. An individual with pornography addiction can have their PFC gray matter increase, albeit slowly, and recover fully.

The increase of pornography use interferes with the brain by altering years of biological and evolutionary characteristics that
have kept humans alive (Fattore et al., 2010; Zhou et al., 2011). The release of DA in the PFC during sexual activities have helped individuals to procreate, but the overstimulation of this process may result in a pornography addiction epidemic in today’s modern society. Thus, what is a natural biological response to stimuli has created an interesting occurrence in the 21st century, as individuals are oversupplied with biological stimuli.

As scientists continue to explore the consequences that behavioral addictions have on the brain, research into pornography and other addictions will be critical to understanding how one handles the addictions and how doctors and psychologists can best treat the individual that is in the grasp of a behavioral cycle that self-discipline alone cannot help. As the similarities between behavioral and substance addictions in the brain are mostly indistinguishable, behavioral addictions may be further treated with substance addiction recovery procedures such as group therapy, medications, and rehabilitation. More research into how pornography affects the vIPFC, DLPFC, and mPFC will help to achieve breakthroughs in how the brain functions when self-control is inhibited and how individuals with behavioral addictions, such a pornography use, become addicted and stay addicted. The more scientists research pornography addiction effects on the brain, the more success the medical world may achieve in helping individuals affected by the societal stigmas associated with behavioral addictions.

References


Krueger, R. B. (2016). Diagnosis of hypersexual or compulsive sexual behavior can be made using ICD-10 and DSM-5 despite rejection of this diagnosis by the American psychiatric association. *Addiction, 111*(12), 2110-2111. doi:10.1111/add.13366


The Expression of Gratitude as a Contributor to Marital Strength

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Abstract

Gratitude is an important positive emotion for personal and social growth; its expression enhances interpersonal connections by fulfilling innate human needs to receive security, support, and merit from others (Carnegie, 1936/1981; Johnson, 2008; Lamberti & Fincham, 2011). In light of more recent research on the expression of gratitude in dyadic relationships, gratitude is considered to be a paramount emotion for communicating “responsiveness” and for marriage survival (Algoe, Fredrickson, & Gable, 2013; Algoe, Kurtz, & Hilaire, 2016; Algoe & Zhaoyang, 2016). When spouses express appreciation, sincerity is necessary for gratitude to strengthen a marriage (Gordon, Arnette, & Smith, 2011; Leong, 2012). Furthermore, insincere gratitude, or a belief that gratitude is not genuine, can be detrimental to already suffering relationships (Leong, 2012). As truly appreciative feelings and expressions increase in a marriage, the relationship will be improved because grateful feelings often influence partners to invest more time and energy in favor of the relationship (Gordon, Impett, Kogan, Oveis, & Keltner, 2012; Lambert & Fincham, 2011). These studies on gratitude and marriage demonstrate that feeling and expressing gratitude can be an important aspect of positive marital development and connection.
Susanna placed the last plate on the dish rack, dried her hands, and crossed into the living room to sit on the couch next to Carter. It was his birthday and she had been working hard to make it special. As she rested a moment, she realized how much it would mean to know that he appreciated her efforts, yet she was unsure how to ask for the recognition she needed. A little while later, Carter approached her saying, “Thank you for making my birthday special. I want to tell you that I appreciate you and what you’ve done for me.” She perked up at his words and immediately felt grateful toward him for letting her know that her hard work had not gone unnoticed. These feelings prompted her to wonder how a simple, sincere expression of thanks from her husband could lead her to feel more than willing to sacrifice for him. She said, “Thank you for telling me that,” and thought to herself: For him, I would gladly do it again.

Researchers have studied gratitude for many years, but only more recently have they begun to examine the unique and important influence it may have on marriage relationships. Empirical studies promote the idea that the expression of gratitude in marriages instigates behaviors that notably improve relationships and sustain long-term connections (Algoe, Kurtz, & Hilaire, 2016; Bartlett, Condon, Cruz, Baumann, & Desteno, 2012). Some view gratitude as an adhesive that assists a couple in strengthening their relationship because it motivates both partners to participate in and perform uplifting behaviors (Algoe & Way, 2014; Algoe & Zhaoyang, 2016). Though it may seem intuitive to give thanks, the explanations for why it improves a relationship are deeper than cultural norms and expectations.

Human beings feel the need to be appreciated by one another. Several authors have stated that the desire to be esteemed and valued is as common as the need to breathe (Carnegie, 1936/1981; Lambert & Fincham, 2011). Lambert and Fincham (2011) explained, “Given all the documented benefits of receiving appreciation, it is not surprising that psychologist William James…stated that ‘the deepest principle in human nature is the craving to be appreciated’” (p. 53). Furthermore, giving gratitude and praise is as important as receiving them. Higher levels of happiness in relationships are associated with higher levels of gratitude expression (Lambert & Fincham, 2011). Refraining from expressing or receiving appreciation lowers self-esteem and satisfaction in many types of relationships (Kleinman, Kuenne, Kuhr, & Thyne, 2007). Consequently, an attitude of gratitude is not merely a catchphrase for the optimistic, but rather a valuable part of self- and relational development.

In fact, gratitude is a necessary emotion. It assists in the evolutionary process of finding a stable partner and consistently reminding oneself of the value of that partner (Algoe & Way, 2014; Bartlett et al., 2012). However, the positive benefits of expressing gratitude are often dependent on the sincerity of one’s perceived responsiveness, which is a critical characteristic of all relationship-strengthening practices (Algoe & Zhaoyang, 2016). A partner who is responsive shows care, concern, and awareness for the other person’s needs, which helps the receiver to understand the intent behind the giver’s actions (Algoe & Zhaoyang, 2016). In other words, spouses must feel and express gratitude genuinely, like with other positive behaviors, for it to have the full positive effect that helps to heal and reinforce bonding.

Gratitude powerfully connects couples, so it may be important to consider what leads one to experience gratitude and then express it. Positive change come from looking for things to be grateful for, not necessarily having things to be grateful for (Barker, 2015). In relationships, experiencing a little gratitude goes a long way to affect one’s own perspective, yet it can be difficult to remember to sincerely express it and inform the other person of one’s thankfulness. Although the expression of sincere gratitude is a commonly neglected relational practice, the cultivation of such feelings enhances positive interactions that are vital for maintaining successful marital relationships because couples who acquire and
express gratitude experience greater conflict resolution, foster enhanced appreciation for one another, and develop a heightened sense that personal efforts are valued. These functions of gratitude in marriage help to fulfill the human need to be valued, the desire to be connected to loved ones, and the motivation to maintain one’s relationship.

**Innate Desire to Be Valued**

The short film titled “Validation” emphasizes the depth with which most people desire to feel important (Kleinman et al., 2007). In the film, a man unexpectedly offers uplifting comments to anyone who approaches him, and the number of people who flock to hear his compliments exponentially increases as they experience the satisfaction of being appreciated and valued (Kleinman et al., 2007). All individuals want to receive love and appreciation in some way, and this is most significant in marital relationships (Carnegie, 1936/1981; Gordon, Impett, Kogan, Oveis, & Keltner, 2012; Lambert & Fincham, 2011; Leong, 2012). Thus, experiencing gratitude is beneficial to the self and others, specifically one’s marriage partner (Chang, Li, Teng, Berki, & Chen, 2013). When two people commit to fulfilling one another’s needs in marriage, it becomes even more important for them to satisfy their partner’s need to be valued. In one study on marriage and divorce, many divorced participants indicated that feeling undervalued and unloved was the central cause of their divorce (Gordon et al., 2012). A person will lose the desire to promote the relationship if it does not meet their innate human needs (Gordon et al., 2012). As humans, each person needs to be esteemed and appreciated, especially in close relationships.

Sharing one’s gratitude is a principal means of refining these feelings of esteem and appreciation within a relationship. Gratitude instigates positive feelings and interactions that help partners to feel loved. Making the effort to express gratitude to one’s partner demonstrates to them that they are valued for their contributions and for who they are as an individual (Lambert & Fincham, 2011). As one longitudinal study showed, the expression of gratitude benefits relationships by helping couples to feel appreciated, adjusted, and confident in their relationships (Lambert & Fincham, 2011). When one partner is required to sacrifice for the relationship, appreciation (or gratitude) acts as a mediator. This helps the person feel that their partner is contributing with equal effort. In fact, researchers found that receiving acknowledgement for contributions to the relationship positively correlated with satisfaction in the relationship (Lambert & Fincham, 2011). Experiencing and expressing gratitude is a critical element in marital relationships because it allows for relationship stability that comes when both partners feel appreciated.

**Gratitude as an Evolutionary Emotion**

From an evolutionary perspective, gratitude plays a unique role in relationship success. Many researchers have studied the influence of emotions on human survival and have found that emotions influence important survival decisions (Algoe, Fredrickson, & Gable, 2013). Feeling and expressing gratitude evolved as an emotional cue that helps in selecting a prime potential partner. As an emotion, gratitude draws attention to another person who is helpful and kind, which assists in the process of choosing a fit mate. It also increases feelings of contentment with one’s partner after they are chosen. Experimental studies demonstrate that these phenomena lengthen the survival of the couple and their offspring (Algoe et al., 2016; Bartlett et al., 2012). Feeling gratitude allows a person to appreciate helpful behaviors in specific circumstances, as well as to appreciate their partner for their cumulative good (Lambert & Fincham, 2011). Gratitude has helped humans to form stronger relationships for centuries, and it is an important element to any successful marriage.

**Emotional Connection**

In like manner, the positive emotions that accompany grateful feelings affect both partners in a marriage, and one spouse’s feelings of gratitude positively correlate with the other spouse’s feelings of gratitude (Gordon et al., 2012). Gordon et al. (2012) conducted a longitudinal study and determined that gratitude between marriage
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Deal with their deep emotional needs in a variety of ways, these needs are central to marital relationships. By expressing gratitude in words and actions, married couples can achieve greater connection because they trust that their spouse will continue to meet their important needs.

Insincere Gratitude

Even though it may be easy to conclude that increasing expressions of gratitude is always beneficial, gratitude is best expressed with sincerity. In a longitudinal study on grateful exchanges between spouses, Leong (2012) found that greater amounts of grateful expressions did not consistently lead to increased marital satisfaction. The findings indicate that sensing that one’s partner is truly grateful benefits a marriage; however, if an individual feels that the gratitude expressed is not genuine, it will harm the connection between two people more than help it (Leong, 2012). Especially when existing problems are weakening a relationship, increasing the number of gratitude expressions does not help and may be somewhat destructive, if insincere (Leong, 2012). Applying gratitude to a relationship is simple, yet it requires meaningful intent and awareness of the other person’s feelings in order for it to benefit the relationship.

There are times when a sudden increase in expressions of gratitude may not be the ideal approach to improving a relationship. Another study on spousal gratitude expression indicated that increased expressions of gratitude did not influence relationships as the researchers expected it would (Gordon et al., 2011). During this research, participants of the study achieved higher levels of contentment in their marriage when they felt gratitude but did not express it (Gordon et al., 2011). The researchers determined possible explanations for these results and proposed that gratitude felt is more influential than gratitude expressed when spouses imagine their partner to have alternative motives for the expression, when the expression goes unnoticed for its simplicity, or when the relationship is in need of more healing than an expression of gratitude can satisfy (Gordon et al., 2011).

Attachment

The emotional human needs discussed previously, which involve being valued, loved, and cared for, are closely related to certain theories of child development and interpersonal progression. Attachment needs, the fulfillment of which are considered critical to child development (Solom, Watkins, McCurrrach, & Scheibe, 2017), continue into adulthood, affecting a person’s romantic or marital connections (Johnson, 2008). These inherent needs make emotional closeness invaluable for spouses, and each spouse needs to be assured that their partner supports and esteems them (Johnson, 2008). Spouse’s solidify this reassurance when one partner’s behavior demonstrates concern for the other (Algoe & Zhaoyang, 2016; Johnson, 2008). In the literature on gratitude and relationships, “perceived partner responsiveness” is an essential ingredient for relationship improvement and satisfaction and it accompanies behaviors that communicate awareness and affection for the other person’s experiences (Algoe et al., 2013; Algoe et al., 2016; Algoe & Zhaoyang, 2016). Expressions of gratitude can be one means of effectively communicating appreciation and mindfulness within couples. Although individuals
Therefore, being able to apply gratitude in a helpful manner may require sensitivity to the needs of one’s relationship and a genuine and meaningful approach. As O’Connell, O’Shea, and Gallagher (2016) found, sincere gratitude expressed over a period of time has the potential of significantly improving a person’s attitude toward a relationship. Accordingly, as one uses genuine gratitude to acknowledge their partner, happiness in the relationship increases.

**Motivation to Perpetuate the Relationship**

In a society of give-and-take, anyone may interpret a person’s expression of gratitude as a request for reciprocity and appreciation. Researchers on gratitude do not entirely disagree with this idea, particularly because feeling grateful encourages a person to respond with another kind deed (Bartlett et al., 2012), and feeling appreciated is necessary for relationships to last (Joel, Gordon, Impett, MacDonald, & Keltner, 2013). Feeling grateful motivates individuals to continue promoting whatever it is that gave them something to be grateful for; couples will sacrifice more for a relationship when they feel grateful for it (Joel et al., 2013). Therefore, a small feeling or expression of gratitude can facilitate great acts of selflessness (Bartlett et al., 2012) and reinforced commitment in marriage (Joel et al., 2013). An experiment conducted by Bartlett et al. (2012) exemplified that in long-term relationships, high levels of commitment did not necessarily relate to increased gratitude, but more gratitude in the relationship positively correlated with greater commitment. Because the influence of gratitude extends to the strengthening of a close, mutual relationship, it is more than a momentary act of payment and repayment (Joel et al., 2013). Receiving and experiencing gratitude initiates behaviors beyond simple reciprocity such as continual acknowledgment of the other person’s efforts and sacrifices, resolution of relationship issues, and motivation to meet the needs of the relationship.

**Continual Acknowledgement of Effort**

One of the valuable consequences of expressing gratitude in relationships is that it encourages partners to develop a perspective of recognition for the other person’s sacrifices. Many researchers have stated that feeling and expressing gratitude in relationships is a critical factor in sustaining a healthy relationship (Bartlett et al., 2012; Joel et al., 2013; Lambert & Fincham, 2011). Increased gratitude leads to a greater capacity to recognize the good in one’s partner and feel gratitude toward them as well (Gordon et al., 2011). As marriage partners give gratitude and improve in acknowledgment of one another’s contributions to the relationship, both partners also increase in gratitude.

Learning to recognize another’s efforts is essential to fostering gratitude within a marriage: a person will more frequently feel grateful toward their spouse if the person learns to see the good that their spouse does. After one invests in the relationship, receiving gratitude is vital for commitment to continue (Gordon et al., 2012; Joel et al., 2013). Joel et al. (2013) performed a study in which participants reflected daily on contributions their romantic partners had made in the relationship; they found that gratitude and trust increased after doing so, much more than in the control group. In a later part of the study, participants who voiced their gratitude felt a stronger sense of stewardship or care for their partners (Joel et al., 2013). In other words, expressing gratitude to a marriage companion strengthens the other person’s tendency to feel grateful as well as one’s own level of concern for the other.

**Resolution of Relationship Issues**

An individual’s improved care and concern for their companion accompanies a desire to promote a healthy and beneficial relationship. One characteristic of a healthy relationship is the ability of both members to take care of problems as they arise and solve disagreements (Lambert & Fincham, 2011). After conducting a study on gratitude and relationship predicaments, researchers concluded that expressing gratitude initiates an increase in favorable feelings toward one’s partner along with a willingness to
discuss and resolve issues in the relationship (Lambert & Fincham, 2011). Increasing feelings of gratitude and appreciation in both parties of a relationship can enhance a couple’s positive perception of and commitment to the unit.

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Gordon et al. (2012) explain how gratitude expression increases commitment in relationships with a simple cycle (see Figure 1). When one person feels valued in a dyadic relationship or marriage, they tend to value the other person in return. They act on these feelings with behaviors that sustain the relationship, whether by reaching out when the other is in need or by sacrificing time and energy to strengthen their connection (Gordon et al., 2012). Additionally, this research suggests an interesting idea: spouses can express appreciation through positive behaviors or with uplifting words, although both have the potential to benefit a marriage (Gordon et al., 2012). Other studies support the findings that investing in a relationship often results in the other person sacrificing as well (Bartlett et al., 2012; Joel et al., 2013). Therefore, gratitude serves as a type of mediator between positive contributions from each partner; a person usually feels grateful after recognizing a sacrifice another made for them, and this feeling motivates them to appreciate the other person and sacrifice for them too (Bartlett et al., 2012; Gordon et al., 2012; Joel et al., 2013). The elements of this proposed cycle often interconnect as each partner feels valued for various reasons (Gordon et al., 2012). Ultimately, sincere gratitude is a reliable relationship builder when it is cultivated between two partners.

**Gratitude Applied**

With these things in mind, couples may develop grateful perspectives as one of many possible relationship-strengthening approaches. Married couples will see most effects of gratitude on their relationship when they cultivate a personal ability to experience gratitude, a willingness to share it, and an awareness of when it is given (Gordon et al., 2012; Gordon et al., 2011; Joel et al., 2013; Leong, 2012). If the act of searching for a reason to feel grateful increases happiness (Barker, 2015), then it seems possible that this searching for gratitude and expressing it often also increases levels of relationship happiness (O’Connell et al., 2016). Researchers who have conducted studies on gratitude recommend that romantic couples strive to develop a deep sense of appreciation for their partner and to learn to recognize the good in them (Gordon et al., 2012; Gordon et al., 2011). In particular, one set of researchers proposed that gratitude might have the greatest positive influence if marriage partners seek to consider the good in their spouse and learn to focus on the positive aspects of their marriage, rather than trying to force improvement by expressing more gratitude (Gordon et al., 2011). A person will not express gratitude unless they have learned to feel it first (Gordon et al., 2011). If accumulating feelings of gratitude is difficult, researchers suggest that partners look for evidence of the investments that their spouses have made in the relationship; doing so will encourage feelings of appreciation for the other person (Joel et al., 2013). If accumulating feelings of gratitude is difficult, researchers suggest that partners look for evidence of the investments that their spouses have made in the relationship; doing so will encourage feelings of appreciation for the other person (Joel et al., 2013). Choosing to increase one’s own gratitude brings twice as many benefits as expected because increasing one’s own gratitude will often influence one’s partner to do the same (Gordon et al., 2012; Gordon et al., 2011; Leong, 2012). The influence of gratitude is powerful, and the cultivation of this simple emotion in relationships is invaluable.

As an individual increases the amount of gratitude they feel, their relationships grow in countless positive ways. Gordon et al. (2012) stated that a person ought to allow greater feelings of gratitude to motivate healthy relationship behaviors, which allows them to improve the relationship and behaviorally express appreciation for their partner. Important relationship practices include forming and strengthening positive attachment habits, which allow for equal levels of trust, commitment, and compassion between both partners (Johnson, 2008). Additionally, while cultivating gratitude and appreciation, couples can feel greater affection for their partner and choose to address relationship problems with a positive attitude that helps them to avoid unnecessary complaints and accusations (Lambert & Fincham,
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2011). These positive contributions to the marriage are important in assisting one’s partner to experience and then express gratitude consistently (Joel et al., 2013). Continually developing and expressing gratitude may serve as a positive interaction between couples that potentially instigates further positive behaviors, helping a marriage relationship to grow stronger in commitment and appreciation.

Conclusion

In the existing literature on gratitude in relationships, several important observations have been made about the influence that grateful expressions may have on a person. Primarily, expressing gratitude is a potential means of meeting a partner’s desire to feel valued, a feeling that has been considered to be significant in the selection of a long-term companion (Chang et al. 2013; Gordon et al., 2011; Lambert & Fincham, 2011). Experiencing gratitude and hearing it given by one’s partner strengthen a relationship by fortifying feelings of security and trust, as long as the expressions are sincere (Gordon et al., 2011; Lambert & Fincham, 2011; Leong 2012). This emotional connection is one of the most prevalent effects of gratitude in marriage or long-term relationships because grateful emotions and expressions are two ways of encouraging healthy attachment styles (Algoe et al., 2013; Algoe et al., 2016; Algoe & Zhaoyang, 2016; Johnson, 2008). Additionally, the cycle of receiving, experiencing, and expressing gratitude continually perpetuates the relationship by making one aware of another’s helpful actions, motivating participation in mutual forgiveness, and initiating actions that fulfill interpersonal needs (Bartlett et al., 2012; Gordon et al., 2012; Joel et al., 2013; Lambert & Fincham, 2011). As depicted above, gratitude is a unique way of positively contributing to marriage relationships.

A few of the aforementioned studies have indicated that there is room for further research on gratitude and its implications for marital connections. Namely, Gordon et al. (2011) suggested that more studies need to be conducted on when gratitude expressions are most helpful or most harmful, so individuals can understand how to best to demonstrate their appreciation. Further research focused on expressions of gratitude would help increase understanding about how such expressions might benefit a marriage. Relationship education researchers who are concerned with these subjects could consider studying sentiments and expressions of gratitude and their effects on marriage relationships. Because relationship-strengthening programs often include an increase in positive couple interaction such as expressing gratitude, it might be possible to take knowledge gained about gratitude and create practical application programs for couples to apply in their own lives. A system that would help individuals to be more grateful could yield positive results, as seen with other relationship-building practices. Among these benefits would be the improvement of marriages with simple gratitude experiences and expressions, which will allow couples to more deeply value each other and successfully sustain their relationship.

References

Figure 1. The interaction of gratitude and dyadic relationship improvement as partners receive appreciation, feel appreciative, and participate in behaviors that strengthen the relationship. Adapted from “To Have and to Hold: Gratitude Promotes Relationship Maintenance in Intimate Bonds,” by A.M. Gordon, E.A. Impett, A. Kogan, C. Oveis, and D. Keltner, 2012, *Journal of Personality and Social Psychology, 103*(2).
Treating Comorbid PTSD and BPD: A Dialectical Approach

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Abstract

According to the biosocial developmental model for borderline personality disorder (BPD), individuals with a biological vulnerability (i.e., heightened emotional sensitivity and impulsive tendencies), plus an invalidating environment may develop BPD (Crowell, Beauchaine, & Linehan, 2009). Individuals with BPD are especially difficult to treat, because of their “extreme emotional, behavioral, and cognitive dysregulation” (Crowell et al., 2009). Though challenging to treat, BPD can be successfully treated using dialectical behavior therapy (DBT) (Linehan, 1993; Linehan 2015). Similarly, posttraumatic stress disorder (PTSD) is complex and often difficult to treat, because of the intensity of the emotional content related to traumatic events and high symptom severity including flashbacks, dissociation, and nightmares (Foa, 1993). PTSD can be adequately treated using exposure-based interventions, such as prolonged exposure (Foa, Chrestman, & Gilboa-Schechtman, 2009). However, when BPD is comorbid with PTSD, symptom severity is often heightened to such a degree that neither DBT nor exposure-based therapy are sufficient treatments. This literature review discusses the problems related to treating individuals with comorbid BPD and PTSD, and the benefits of the current treatment protocol, dialectical behavior therapy prolonged exposure.
personality disorder (BPD) and subsequent suicidal behavior are often short-changed of treatment, resulting in poorer overall symptom reduction.

BPD is a highly misunderstood and stigmatized disorder, perhaps, in part due to the intensity of characteristic symptoms, such as unstable interpersonal relationships, distorted self-image, volatile affect, and extreme impulsivity (Linehan, Cochran, Mar, Levensky, & Comtois, 2000). The biosocial developmental model for BPD explains that individuals with a biological vulnerability (i.e., heightened emotional sensitivity and impulsive tendencies) plus an invalidating environment tend to develop BPD (Crowell, Beauchaine, & Linehan, 2009). Individuals with BPD are notorious for severe non-suicidal self-injury as well as frequent suicide attempts (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Linehan et al., 2006; Linehan et al., 2015). The acuity of these symptoms makes treatment arduous and often strains the attending therapist leading to therapist burnout.

BPD is most commonly treated with dialectical behavior therapy (DBT) (Linehan, 1993; Linehan, 2015). This treatment targets many of the common symptoms, and specifically, the self-injurious behavior. The DBT protocol suggests a year of rigorous treatment (Linehan, 1993; Linehan, 2015). Though time in treatment is longer for this approach, DBT has proven more effective than other manualized treatments.

DBT is a useful and successful treatment approach for individuals with BPD, as well as many other diagnoses, because it combines skills from many types of therapies, including mindfulness, acceptance commitment therapy, and cognitive behavior therapy (Federici, Wisniewski, & Ben-Porath, 2012). It integrates these approaches using four critical skill sets: mindfulness, emotion regulation, interpersonal effectiveness, and distress tolerance. All four skills are centered around the core goal of DBT: to help chronically ill individuals deal with the pains of their lives and ultimately build a life that they feel is worth living (Linehan, 1993; Linehan, 2015).

Though DBT provides efficacious treatment of BPD, individuals with BPD often also have a trauma history. Researchers estimate that between 30-50% of individuals with BPD meet full criteria for PTSD (Granato, Wilks, Miga, Korsland, & Linehan, 2015; Harned, Risvi, & Linehan, 2010). Co-occurring BPD and PTSD is complicated to treat. When therapists use traditional DBT, the symptoms of PTSD make remission from borderline symptoms far less likely and DBT treatment much longer (Linehan et al., 2006). Additionally, the use of traditional PTSD treatment can be dangerous, because it often exacerbates existing self-injurious behavior (Harned, Tkachuck, & Youngberg, 2013). Some evidence has suggested that exposure-based treatment for individuals with BPD can be harmful or even potentially fatal (Foa, 1993; Foa et al., 2009; van Minnen et al., 2012).

Recent research has suggested use of DBT as a precursor and subsequent structure for undergoing traditional trauma treatment, specifically prolonged exposure (Harned, Jackson, Comtois, & Linehan, 2010; Harned, Korslund, Foa, & Linehan, 2012; Harned, Korslund, & Linehan, 2014; Harned & Linehan 2008; Harned et al., 2010; Harned, Ruork, Liu, & Tkachuck, 2015). Using DBT as a foundation for traditional treatment of individuals with co-occurring PTSD and BPD could lead to more effective, safer, and quicker outcomes in treatment. The first section of this paper will discuss the structure of DBT and how it functions to treat individuals with BPD. The second section will discuss problems of treating individuals with comorbid BPD and PTSD, followed by an analysis of the suggested treatment model: dialectical behavior therapy prolonged exposure (DBT PE).

Structure and Function of DBT

DBT is a brand of cognitive behavioral therapy initially developed by Marsha Linehan (1993) for adult women with BPD and chronic suicidal behavior. It was the first treatment of its kind to demonstrate its success in a randomized controlled trial (Linehan et al., 1991). In its early stages, Linehan encountered many problems with the treatment of BPD and chronic suicidal behavior. Clients
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were often non-collaborative in session, did not practice agreed upon homework assignments, and often did not return for follow-up sessions. These behaviors are termed “therapy interfering” and are thought to develop from clients believing that they are incapable of change. This subsequently causes them to interpret change-focused treatment as invalidating and unimportant (Linehan 1993, Linehan et al., 1991; Linehan et al., 2006; Linehan 2015). Linehan decided to incorporate principles of Zen mindfulness, acceptance, and validation into DBT’s change-based cognitive behavior therapy structure in order to help clients tolerate the exceptional difficulty of change (Linehan, 1993; Swann, Stein-Seroussi, & Giesler, 1992). Thus, at its core, DBT embodies the central dialectic of acceptance and change, and it uses traditional behavior therapy techniques to reduce symptom severity and orient a client toward recovery (Swales, 2009).

DBT is highly comprehensive and multi-modal. It uses many processes to deal with various symptoms related to clients with BPD. As an overall treatment, DBT structures the therapeutic process into stages, and then a hierarchy within those stages. This section will first address the various modes of DBT, and then explain the stages of treatment and treatment hierarchy, followed by the current research evidence related to using DBT to address BPD.

Modes of Treatment

DBT combines several modes of therapy including skills training group, individual psychotherapy, telephone coaching, and a DBT consultation team (Linehan, 1993; Linehan, 2015). Each mode of therapy is designed to target a specific challenge related to BPD treatment.

Skills training group. DBT uses a skills training group that teaches four critical skills: mindfulness, distress tolerance, interpersonal effectiveness, and emotional regulation (Linehan, 1993; Linehan, 2015). While mindfulness and distress tolerance skills focus more on the acceptance aspect of the dialectic, interpersonal effectiveness and emotion regulation are more change-oriented. Linehan developed these skills for individuals with BPD. According to the biosocial model of BPD, biological vulnerability and an invalidating environment result in self-management skill deficits and sustaining motivation to change in client’s that is commonly associated with BPD (Linehan et al., 1991; Linehan et al., 2006; Linehan, Heard, & Armstrong 1993). Self-management skill deficits then lead to difficulties in treatment, which DBT skills aim to address. These four critical skills, learned in a group therapy setting, help clients to acquire the skills they lack and to strengthen their existing skills.

Individual psychotherapy. In addition to group psychotherapy, clients also participate in individual DBT psychotherapy. The goal of individual therapy sessions in DBT is to work on motivational problems, determine skill deficits, and assist clients in skill generalization (Linehan, 2015). Skill generalization is defined as helping clients to transition the skills they learn in therapy to non-therapeutic environments (Swales, 2009). A common tool used in both individual and group DBT psychotherapy is the DBT Diary Card (Linehan, 2015). The purpose of the Diary Card is to keep track of target thoughts, feelings, and behaviors. Clients keep track of thoughts, feelings, and behaviors that are both effective (e.g., skill usage) and ineffective (e.g., suicidal and self-injury ideation and behavior) (Linehan, 2015). The Diary Card is then used to guide session content. After identifying problem behaviors, the therapist and client work on chain analyses to identify problem behaviors and solution analyses to identify and reinforce efficacious behaviors (Linehan, 2015). The process of chain analysis and solution analysis is one example of the way in which DBT acts as a behavioral therapy.

Telephone coaching. Another way to strengthen skills learned in both group and individual sessions is telephone consultation or telephone coaching. Telephone coaching is a service offered to DBT clients that allows individuals to contact their therapist between sessions to discuss problem behaviors as they are occurring. The
purpose of this mode of treatment is to strengthen skills and work on skill generalization (Swales, 2009). While this can be quite taxing for the therapist, it is very valuable regarding symptom remission for the DBT clients. 

**DBT consultation team.** Because individuals with BPD can be extremely challenging to treat, DBT uses a consultation team to lighten the burden for the therapist. Research suggests that clients with BPD often have multiple comorbidities and are at high risk for suicide and non-suicidal self-injury (Linehan et al., 2000). Between 75% and 81% of individuals with BPD have a history of at least one suicide attempt or self-injurious behavior (Dulit, Fyer, Leon, Brodsky, & Frances, 1994). Unstable patterns of behavior resulting from a diagnosis of BPD prove particularly challenging for psychotherapists and often lead to a condition called burnout, or therapeutic burnout (Linehan et al., 2000). Therapeutic burnout has been defined as a condition of emotional exhaustion, depersonalization, and a lack of feeling of personal accomplishment (Linehan et al., 2000). Burnout causes therapists to be less effective during treatment, which leads to worse outcomes for their patients (Linehan et al., 2000). DBT is a recursive therapy that requires the therapists to apply the very skills they teach their clients to themselves (Linehan et al., 2000). DBT has also been associated with an approximately one-third increase in treatment retention in abstaining from self-injurious behaviors (Bohus et al., 2004). DBT has proven successful in treating individuals with a variety of diagnoses outside of BPD, including substance abuse and drug dependence, eating disorders, and a variety of mood disorders (Courbasson, Nishikawa, & Dixon, 2012; Federici et al., 2012; Safer & Jo, 2010). Despite its effectiveness in treating individuals with BPD, until recently, DBT has not had a well-defined or empirically supported protocol for trauma treatment. Moreover, the DBT literature has not included much research about individuals with comorbid PTSD and BPD. The remainder of this literature review will examine the existing protocol for DBT PE and its efficacy in treating comorbidity of PTSD and BDP.

**Treatment Structure and Hierarchy**

DBT structures its treatment into stages. Before treatment begins, clients are in a pre-treatment stage (Linehan, 2015). In this stage, the therapist and client determine the client’s goals and link them to the therapy process (Swales, 2009). In stage one, the therapist and client approach problems related to behavioral stability such as self-injury, suicidal ideation, and therapy-interfering behaviors (Linehan, 1993; Linehan, 2015). Once these behaviors are under control, clients can move into further stages that deal with emotional processing, including resolution of trauma treatment (Linehan, 2015). This process facilitates symptom remission for clients by addressing the current needs of the client and encourages progress towards symptom remission.

**An Evidence-based Treatment**

DBT is the most empirically substantiated treatment for BPD, suicidal behavior, and non-suicidal self-injury. To date, there have been at least 15 randomized controlled trials demonstrating the efficacy of standard DBT (Swales, 2009). When compared with treatment-as-usual, evidence suggests that DBT reduces hospital admission for suicidal intent and behavior by at least half (Linehan et al., 2006). DBT has also been associated with an approximately one-third increase in treatment retention in abstaining from self-injurious behaviors (Bohus et al., 2004). DBT has proven successful in treating individuals with a variety of diagnoses outside of BPD, including substance abuse and drug dependence, eating disorders, and a variety of mood disorders (Courbasson, Nishikawa, & Dixon, 2012; Federici et al., 2012; Safer & Jo, 2010). Despite its effectiveness in treating individuals with BPD, until recently, DBT has not had a well-defined or empirically supported protocol for trauma treatment. Moreover, the DBT literature has not included much research about individuals with comorbid PTSD and BPD. The remainder of this literature review will examine the existing protocol for DBT PE and its efficacy in treating comorbidity of PTSD and BDP.

**Treatment Problems and Solutions in Comorbid BPD and PTSD**

Common among many individuals with BPD is the experience of an invalidating environment that may include childhood sexual, emotional, or physical abuse (Harned et al., 2010). Childhood abuse is considered a criterion “A” trauma. In individuals with
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Because of the exclusion of individuals with BPD from being treated with PE, most studies involving DBT and PTSD have not incorporated exposure-related therapies, and instead focus on using DBT alone. Furthermore, past research has suggested that using DBT to treat BPD with comorbid PTSD has a remission rate of only about 35% (Harned & Linehan, 2008). Recent research suggests that if DBT is used as a precursor and subsequently in combination with PE, outcomes may be far better.

DBT as a precursor. In 2010, Harned et al. published a study in which DBT was used as a precursor to traditional trauma treatment. The goal was to determine whether clients could eliminate suicidal and self-injuring behaviors that are common exclusionary factors to trauma treatment. The result of this study was that imminent suicide risk and substance dependence were eliminated in the study participants. Additionally, the study demonstrated a reduction in self-injury and dissociation. As a result, between 50% and 68% of individuals were ready to proceed with traditional exposure-based treatment after one-year of DBT (Harned et al., 2010). This study, as well as other studies, suggests that the remainder of individuals seemed to persist in self-injurious behaviors regardless of DBT treatment length (Harned et al., 2010; Harned & Linhean 2008, Harned et al., 2012).

One proposed hypothesis states that individuals with severe co-occurring BPD and PTSD might not be able to resolve all their self-injurious behaviors until PTSD is adequately treated (Harned & Linehan, 2008; Harned et al., 2013). Therefore, many studies have suggested that DBT be used in conjunction with PE to treat individuals who, after substantial DBT, are continuing to experience symptoms of BPD that would serve as exclusionary criteria to trauma treatment.

Additionally, even though DBT is quite efficacious as a preparatory treatment for PTSD, it does not appear to change outcomes for overall PTSD remission. Individuals with BPD and PTSD seem to struggle more in trauma treatment, even with adequate treatment of borderline symptoms (Harned et al., 2010). This is consistent with current research that suggests greater PTSD...
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One of the common problems associated with using PE for individuals with PTSD is treatment dropout (Foa et al., 2007). This is worrisome in context of the high prevalence of impulsive behavior and self-injurious behavior related to BPD. Traditionally, trauma treatment dropout is greatly increased with comorbid BPD; however, the use of DBT PE has been associated with greater treatment satisfaction among patients and has shown a 40% lower treatment dropout rate than standard trauma treatment (Harned et al., 2013; Harned et al., 2014). Additionally, in another study, researchers determined that clients receiving DBT PE treatment were less likely to attempt suicide and self-injury than individuals undergoing DBT or PE alone (Harned et al., 2015). These preliminary results suggest that DBT PE may be a safer and more reliable treatment model for co-occurring BPD and PTSD, because this protocol adequately addresses the concerns related to BPD and PTSD—namely, high symptom severity and therapy interfering behaviors.

Conclusion

Though BPD is frequently associated with PTSD, comorbidity of BPD with PTSD is especially challenging to treat due to the symptom severity of BPD including self-injurious behavior and lack of compliance in therapy. The severity of life-threatening behaviors related to BPD makes trauma treatment particularly risky and encourages clinicians to exclude clients from exposure-based trauma protocol. However, recent research has suggested using DBT as a preparatory treatment to DBT PE. These treatment models provide a potential for more effective treatment of individuals with BPD and a trauma history by addressing problems such as suicidal ideation, non-suicidal self-injury, therapeutic burnout, treatment dropout rate, and trauma-related symptoms. Because of promising recent research developments in this treatment model, future researchers might consider performing randomized controlled trials to solidify the efficacy of DBT PE, as well as to try applying DBT PE trauma treatment to other comorbid diagnoses beyond BPD.
References


Flavia has been seeing a therapist for the past several years to help cope with her delusions and violent behavior. As the session commences, she brings out her dream journal and tells her therapist about her latest nighttime vision, filled with intense and dark conversation between Flavia and her cousin. Immediately, the therapist sees a connection between the meaning behind the dream and his client’s current situation. The pair jumps on the opportunity and dives into a conversation through which Flavia ultimately discovers a key to controlling her aggression (Marozza, 2005).

People such as Flavia, who take note of and discuss their dreams with those trained in the field of psychoanalysis, surely recognize the potential power behind their dreams. Dreams have long been a subject of study among psychologists. Before proceeding, it is necessary to define “dream” as it will be used throughout this paper. According to Hall and Castle (1966), the operational definition of a dream is “that which a person reports when he [or she] is asked to relate a dream, excluding statements which are comments upon or interpretations of the dream” (p. 18). In other words, a dream is whatever each individual perceives it to be. Still, some commonalities exist among various definitions that have been used, such as the occurrence of dreams when the mind is in a state of unconsciousness or subconsciousness (Black, 2000).

Past research indicates that there is often a powerful connection between dreams and experiences in the “waking world”, though there is no conclusive method of analysis available today that would result in accurate interpretations of dreams. Relatively little empirical research has been done pertaining to how modern individuals in the Western world can understand their dreams (Malinowski, 2016). By considering well-known religious interpretations of dream meanings, ancient psychologists’ perspectives, and modern psychological theories, this article argues that dreams should be used more in psychotherapy as a method for helping individuals understand themselves on a deeper level. Dreams have been found to represent the issues of the waking life on which the individual is emotionally focused, sometimes even revealing specific hardships that the dreamer has a difficult time coping with.
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on the importance of dreams and the attached interpretations. He believed that dreams were ultimately a form of “wish fulfillment,” and, since that information is unruly and often disturbing, the preconscious may censor it so the individual does not fully understand the context in the waking world. Psychoanalysts still use this idea today in helping their patients understand some of their unruly desires by offering dream interpretation, reporting that this method aides the psychoanalyst in successfully diagnosing the root problem in their patients (Forrer, 2014). However, while still practiced by psychoanalytically inclined therapists, these methods are not nearly as common today as they were almost a century ago, in part due to more theoretical diversity in therapy practice (Malinowski, 2016).

Carl Jung is another example of a psychologist whose work on dream interpretation left an influential mark, but whose findings are being used much less today. He focused more on how his dreams and the interpretations he attached to them resulted in his life experiences. Jung (1965) also posited that dreams guide individuals through their lives, feeling strongly that following a single dream can offer additional input about an individual, while following a string of dreams over time can offer an increasingly accurate picture of the person’s life. This method has been noted as effective in discovering the “working” — the why, where, and how — in an individual’s development. Yet, similar to Freud, these insights have decreased in popularity as modern-day therapy has continued to evolve (Forrer, 2014; Matthews, 2016).

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Though dreams used to be of significant interest within the field of psychology, the major methods for dream interpretation today are still relatively scattered. Arguably, the most popular dream interpretation method was developed by Calvin Hall, a modern-day psychologist who based his beliefs off of Aristotle’s views (Hall & Castle, 1966). The major premise of Hall’s method is the idea that dreaming is simply thinking during sleep, but that the concepts of dreams are expressed as visual images as opposed to waking thoughts (Black, 2000). Several psychologists have built upon this idea to create their own theories. One example is Hall and Nordby

Literature Review

From a very early time period, dreams were used as a method of self-analysis. Ancient works of holy writ are rampant with examples of dreams that are followed by significant symbolic interpretations (Bar, 2001). Judges 7:13-15 (King James Version), tells the story of a man who relates his dreams of seeing a falling loaf of barley to his friend. The friend goes on to interpret the dream for him, ultimately resulting in a conversation about the individual. Additionally, in the Qur’an, a prophet, Abraham, receives a dream that he must sacrifice his son, and ends up sharing his interpretation with his son (Quran 37:102, Oxford World’s Classics edition). For Abraham and many others within these ancient religious texts, dreams were an integral part of life and carried deep meaning. Regardless of individual beliefs, these ancient texts reveal that people living thousands of years ago believed in dreams as having deep meanings, and not as simply random projections of the brain. From these examples, it is clear that these people used dreams as a method of gaining insight into their lives. Although these early forms of therapy may be considered primal, it is still significant that both dreams and the desire to understand and interpret them may have been around since the early years of the human race.

Though dreams have long been around as a source of personal insight and awareness, they became a significant topic of study just over a century ago. Sigmund Freud (1900) invented psychoanalysis, and was well known for his studies on the potential meaning behind dreams. Freud noted that some desires, such as those that are sexual or aggressive in nature, are unacceptable to the conscious awareness, so they appear instead in dreams in a disguised (symbolic) format. From a more psychological standpoint, Freud was arguably the most popular early psychologist who postulated

time managing (Jaenicke, 2008). By analyzing the various ways that dreams are used in psychoanalysis, or have been used in the past, a more effective and efficient way of analyzing dreams—and implementing them into psychotherapy—can be determined.
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(1972), who believe that during sleep, dreamers are thinking of problems and predicaments, fears and hopes. They also believe that motives behind thoughts in dreams have a common origin (wishes or fears originating from childhood). Though this idea is broadly accepted among modern psychologists (Black, 2000; Pesant & Zarda, 2004), there is little research to support it.

Another popular method among modern psychologists follows the Hill cognitive-experiential approach (Pesant & Zarda, 2004), which states that dreams can often be categorized into one of six major groups: 1) worries and emotions; 2) relationships; 3) work and studies; 4) events and situations; 5) desiring, wanting, and longing; and 6) symbolism. Hill further posits that those whose dreams are of a symbolic nature tend to have more thought suppression, aggressive behavior in dreams, and intense emotions (Malinowski, 2016). Though it is common within psychotherapy, this theory remains separate from other approaches such as Hall’s, and is therefore used sparingly in other settings. Growing out of Hill’s theory, several researchers and clinicians have postulated that dreams, especially those related to worries and emotions, are the mind’s way of modulating those moods in a controlled way. Others have taken it a step further to suggest that dreams not only help understand emotions and conflicts while sleeping, but also serve a similar role in the waking state because individuals tend to attempt to recall and analyze them, which frequently leads to problem-solving (Givrad, 2016).

In summary, perhaps the most consistent modern theory available is Hill’s cognitive-experiential model of working with dreams. Hill believes that dreams are useful therapeutic tools, which aid people in circumventing their defenses to get at their self-awareness (Hill, 2004). The cognitive-experiential model implements aspects of many other existing dream theories, such as Freudian, Gestalt, Jungian, client-centered, and behavioral. Through this mélange was developed a three-stage model where therapists aid clients explore their dreams, gain specific insights into the dreams’ meanings, and then take action to resolve the issues at which their dreams hint are present in their waking lives (Hill, 2004). This approach offers therapists and clients a structured, but flexible method that amplifies the therapeutic benefits of psychoanalysis.

Resistance to Dream Analysis

Several hypotheses exist as to why these theories of dream interpretation are slow in their progression and acceptance among the psychological world as methods of psychotherapy. Perhaps the most prominent hypothesis relates to the intense methodological problems that scientists face when studying dreams. Dreams can only be studied retrospectively and through the subjective report of the dreamer. Any attempt to study dreams must include the account of the dream from the dreamer’s own words. Moreover, because of biases and memory failure, dream reports are understandably questionable, if not entirely untrustworthy (Givrad, 2016). Another potential reason for the slowed progress of dream interpretation as a method of psychotherapy began in the twentieth century. Both psychoanalysis and behaviorism had started to grow and gain popularity, the former advocating a greater focus on the meaning attached to dreams, while the latter questioned the existence of dreams altogether. In separate ways, these theories weakened the systematic study of dreams in larger sample sizes, thus reducing the work and research done on dream therapy during this time period (Desseilles, Dang-Vu, Sterpenich, & Schwartz, 2011).

Another important and common issue among psychotherapists regarding the use of dreams is varying ideas of what dreams consist of and what they do to an individual’s mind (Givrad, 2016). Several researchers have gone into great detail on this subject, resulting in a hypothesis that is broadly accepted: dreaming causes an increase in affective arousal—which includes both physiological responses and limbic system activity (Kramer, 1993). Further studies built on this fairly recent acclaim by suggesting that dreams often produce...
parallel emotions, actions, or images (Matthews, 2016). These new ideas support the idea that dreams can be studied, analyzed, and interpreted to understand an individual on a biological, emotional, and subconscious level.

Regardless of the problems facing the growth of dream therapy for therapists and counselors, there are those who consistently use dream interpretation and achieve desired results. A recent study of dream reports from women who have been exposed to addictive behavior by a romantic partner or a close family member resulted in a strong correlation between the intensity of and themes within their dreams and their waking lives (Parker, 2015). This study found that over 90% of clients who were exposed to family members or significant others with alcoholic problems experienced significantly higher themes of violence and anger in their dreams. Another counselor recently shared the story of a client who came in with built-up anger so intense he was sure he was going to do something he would regret (Perelberg, 2016). By analyzing the man’s latest dream together, the counselor was able to help the man discover the symbolism behind what his mind had played during sleep. This ultimately led to him discovering that his anger was actually directed toward himself due to unresolved issues he had with family members and past friends. Through the process of dream sharing and interpretation, the client was ultimately able to understand the problem at hand—the breakthrough that therapists and counselors desire to have with their clients.

Moving Forward

As has been shown, dream interpretation as a form of psychoanalysis can be effective and should be used more in therapeutic settings. Much research has been done on the good that comes about from dream interpretation (Hall & Castle, 1966; Hall & Nordy, 1972; Kramer, 1993). One set of researchers, Pesant and Zarda (2004), laid out five ways in which dream interpretation within psychotherapy has helped and can help patients. Their study, which followed several hundred participants in clinical settings as they shared their dreams with professionals, produced the following list: Working through dreams can aid clients in learning powerful insights about themselves and increasing their involvement in therapeutic settings, as well as make access to important issues much easier, establish a protected and unguarded environment, and deepen the clinician’s understanding of the client’s current state and growth (Pesant & Zarda, 2004). This, accompanied by many other researchers’ findings (Hartmann, 1995) suggests that clinicians have much to gain by utilizing their clients’ dreams. Sufficient clinical and empirical information is available to surmise that dream interpretation is both useful and effective within psychotherapeutic settings.

In addition to the benefits that dream interpretation offers clinicians, there has been an increasing focus on scrutinizing the effects that it has on participants of psychotherapy within the past century. Dreams have been found to represent the issues of the waking life on which the individual is emotionally focused. In some cases, they even go as far as showing the specific hardships that dreamers struggles to accept because of the extreme difficulty of the issues (Jaenicke, 2008). Dreams seem to contain particles of conscious life and subtly show a problem or mood that is being pushed aside or subdued. Jaenicke (2008) conducted a study that takes this idea a step further by suggesting that finding mutualities between dreaming and waking experiences often lead to the base issue that is most strongly affecting an individual. The implications of this finding are incredible; if clinicians can determine what emotions and moods are being presented within a client’s dream, then they will have access to the core issue of their client’s problem. This possibility is built upon by the idea that though a single dream contains much significant information, following a series of dreams over time can expand the meaning derived from the dream to include where the dreamer perceives he or she is heading and what they most need to work on (Jaenicke, 2008; Matthews, 2016).

The research supporting the use of dream interpretation in psychotherapy are substantial, but the question of how to implement this method still remains. It is necessary, before interpretation commences, that the interpreter knows the
background of the client (Harris-McCoy, 2012). This may include occupation, health, status, habits, and age. Directly following the account of the dream, the dreamer should be asked to give a description of their feelings about each topic, allowing the interpreter a glimpse into the client’s emotional connection to the significance behind each element (Harris-McCoy, 2012). In regard to actual interpretation, and considering the fact that many varying methods of interpretation are available, integrating aspects of different approaches into one flexible and sustainable form could prove to be most beneficial to clients and clinicians alike (Pesant & Zarda, 2004). Hill’s (2004) method of dream interpretation provides one set routine to approaching interpretations that would likely cause more clinicians to use interpretation, permitting clients to experience this new and useful method of analysis.

**Conclusion**

Creating a single, specific organization to dream interpretation may seem like a lofty and unrealistic goal, but if achieved, the results would be beneficial for psychotherapy. However, the development of several varying methods is much more likely, and would still allow for creativity and client-centered decisions for clinicians. One possibility for a set method of dream interpretation is dream dictionaries. This idea, which has existed for over a century, suggests that dictionaries would be made with set interpretations to potential dream scenarios and themes, allowing clinicians to simply look up the symbolic meanings to their clients’ dreams (Szpakowska, 2002). The idea that it is possible to obtain universal meaning from dream symbols or to predict future events from them has been around at least as long as the written word, as was shown in the ancient epic, *Gilgamesh* (Harris-McCoy, 2012). Modern-day psychologists and scholars tend to agree that having such a set method would increase the use of dream interpretation, but would lower its effectiveness (Sparrow, 2013). Even though a set method such as using dream dictionaries could potentially decrease the effectiveness of dream interpretation, it would still cause an increase in its usage and would make available this unique approach to therapists who wish to use it, which, as previously discussed, can bring positive results.

There are, however, some professionals who are already comfortable with using dream interpretation within psychoanalysis and therefore do not need a set method. For such therapists, Sparrow (2013) suggests that if set methods are the future approach to working with dreams, then a co-creative approach that is aligned with a variety of themes in contemporary psychotherapy—such as choice and personal freedoms—would be the most supportive and supplementary way to go about it. Setting methods for dream interpretations with these ideas in mind will allow for the practice of dream interpretation to slide seamlessly into contemporary psychotherapy. A model such as Hill’s cognitive-experiential model meets these needs and wants, and would likely persuade more therapists to include dream interpretations in their practices. Additional research is undoubtedly necessary in order to specify set methods for dream interpretation, particularly in regard to the usage of dream dictionaries, yet once these varying methods are available, the use and effectiveness of dream interpretation will likely increase.

In conclusion, the idea of interpreting dreams as a means of learning more about individuals has been around at least since the beginning of the written word. Varying methods of interpretation have come and gone, and the use of dream work within psychotherapy has begun to wane. However, as set methods for interpretation become available, dream interpretation can become a strong and important factor in contemporary therapy. Dream interpretation may not be the set road to a perfect understanding of humans, but it is certainly an effective and useful road that can and should be pursued (Pesant & Zarda, 2004).
References


Statistics show that approximately 40 million adults living in the United States experience anxiety every year (Anxiety and Depression Association of America, 2016b). Half of these individuals, on average, experience comorbid depression, which alone affects more than six million adults (Anxiety and Depression Association of America, 2016b). Anxiety and depression levels are at an all-time high and are continuing to rise, and these disorders may contribute to the increased rate of suicide (Legg, 2016). This increase of mental illness will likely continue unless preventative methods are employed. Effective treatment of mental disorders is of primary importance to help individuals who are diagnosed with these illnesses.

The cause of mental disorders usually indicates what type of treatment a therapist employs. Many factors contribute to anxiety and depression, including brain chemistry, cognition, trauma, and genetics (Anxiety and Depression Association of America, 2016a; Anxiety and Depression Association of America, 2016b). Treatment may include behavioral, cognitive, and biological methods to combat the specific cause of the illness. Many professionals believe that mental illness is derived solely from biological components; for example, Pierre (2014) found that the act of making choices is indeed a subjective experience and the reality is that the brain ultimately decides what actions are undertaken. From a biological perspective, there is little room for agency, as this view is acquired from a belief that mental illness is deterministic, as are the choices individuals make (Pierre, 2014). If mental illness is biologically contained, prescribing medication to help manage biochemicals would seem logical and anything inconsistent with this treatment, such as free will or agency, will typically not be considered. What if, however, agency was a key contributing factor in mental illness? If this is the case, it would make sense to treat mental disturbance with a free-will-emphasized treatment.

Agency, or the ability to choose, and its relation to mental illness needs to be emphasized because of its contribution to the onset of emotional disorders. This claim is not necessarily suggesting that individuals choose mental illness; however, evidence shows that the
very ability to choose can be a primary factor in mental illness in two different ways. First, a study by LeMoyne and Buchanan (2011) suggested that helicopter parenting, or restrictive parenting, may increase the chance for children to develop depression or anxiety, with a high correlation with low self-esteem. Second, as indicated by Schwartz (2004), having a surplus of choices may induce mental illness in some cases. The influence of choice, whether restrictive or superfluous, thus may be linked to anxiety and depression. Therefore, agency should be examined with greater effort to understand its relationship with mental illness, particularly the benefit of implementing agentic treatment to help individuals with anxiety or depression.

Consequently, scientific evidence has shown that agency (the ability to choose) and autonomy-connectedness (self-governance) have been helpful in the treatment of patients who are mentally ill. According to a study conducted by Myers (2016), promoting agency or free will may have a positive impact in reducing symptoms and empowering individuals who are recovering from mental disorders. As previously mentioned, anxiety and depression affect many people and any effort to decrease their prevalence would be deemed necessary. An autonomy-focused study by Rutten et al. (2016) reported the critical connection between autonomy and anxiety/depression and the effectiveness of autonomy group therapy sessions. Implementing autonomy in therapy could be beneficial, contrary to what others in the psychological community may suggest.

Free will and choice should be emphasized in clinical treatment. Many biological and environmental factors contribute to anxiety and depression, prompting professionals to treat clients by the cause of the illnesses. However, as identified, agency may play a key role as a potential component of mental illness. Just as one may treat anxiety or depression with drugs due to the assumption of biological causes, one should treat anxiety and depression with agentic treatment. For the purpose of this review, agentic treatment is any form of treatment that explicitly regards agency as a critical component of mental illness and integrates agency-focused treatment. Agentic treatment is unique, yet is not widely accepted among the psychological community; consequently, the purpose of this review is to encourage further support and advocacy for agentic forms of treatment. Although the onset, duration, and severity of mental illness (including anxiety and depression) are influenced by a variety of biological and environmental factors, free will and choice are important contributing constructs and should be accentuated clinically, because treatment is more effective when agency is emphasized with a specific focus on autonomy-connectedness and when existentialism is considered within the context of theistic existential therapy.

**Agency**

Implementing agency in psychotherapy can provide benefit to individuals with mental disorders. Agency is defined by Myers (2016) as the ability for an individual to aspire and have resources to achieve goals. Treatment of mental disorders in traditional rehabilitation programs may not be the most effective option for recovery, because agency plays such a critical role in one’s mental health and is usually not emphasized enough in traditional treatment (Myers, 2016; Patterson et al., 2016). To preserve, prevent, or replenish one’s agency, the following therapeutic groups were found to be most effective: peer networks, family help, employment and school intervention, and church groups (Myers, 2016). Replenishing one’s agency involves self-respect, auto-biographical control over one’s life, and people opportunity (the ability to make and sustain relationships) (Myers, 2016). These ideas do not discount or disregard established therapeutic methods; in fact, therapeutic practices that integrate agency and other treatment methods (such as biological or cognitive approaches) have shown to be more beneficial than an exclusive focus on one treatment method (Shumaker, 2012). In helping the mentally ill recover, all viable options should be considered.

Slife (2004) described an example of implementing agency in treatment as used in the therapeutic interventions at a facility called Alldredge Academy. The Alldredge Academy recognizes
the importance of agency in the treatment of its clients and expects them to be accountable for their behavior and actions (Slife, 2004). It does this by encouraging its therapists to avoid persuading clients with logic while emphasizing treatment goals, so clients can incorporate and apply such goals (Slife, 2004). Instead of blaming others, they must take responsibility for their actions. A client by the name of Laura came to the facility after being diagnosed with depression. After staying at the academy for several weeks, Laura felt empowered by the unique treatment methods and experiences at the facility. She developed self-respect as she became hopeful for the future, learned how to show control over situations in her life, and began to participate in healthy relationships, specifically by empathizing with others. Two years after she left, she reported that she had had no serious depression episodes since (Slife, 2004). Slife (2004) asserted that the Alldredge Academy can be a place of reference for the psychological community to learn more about agentic psychotherapy and its effectiveness. Myers (2016) further explains that by so preserving or replenishing agency (depending on the person’s need), patients may avoid chronic illness and become empowered. As an agentic focus helps clients resolve issues they have on the inside, therapy and recovery will likely be enhanced and improved (Spillers, 2007). Reducing symptoms and empowering individuals to make choices may enhance treatment and help clients with anxiety and depression.

Many disagree that agency is a factor in mental illness. These critics argue that agency is merely a subjective sense of ownership of behavior (Pierre, 2014). As cited by Pierre (2014), Libet’s studies have shown that unconscious neural activity always occurs before simple motor movement. In addition, Salamone et al. (2016) indicated that the nucleus accumbens dopamine transmission is mostly responsible for agentic behavior because it regulates choices. This is significant for individuals with mental illness (including depression) because it is an important component involved with symptoms, suggesting that those with mental illness already may be predisposed to a lack of agency. Under this scenario, biological methods are preferable to treat the mentally ill. Soon, Brass, Heinze, and Haynes (2008) found that brain activity predicts behavior as much as 10 seconds before a choice is made, and Hallett (2007) concluded that the subjective sense of agency is mere introspection. But, is agency a subjective construct? Individuals make a wide variety of choices each day that are motivated by a subjective sense of ownership. Human beings use agency consistently in everyday life.

**Autonomy-Connectedness**

Autonomy-connectedness is similar to agency and should be scrutinized further for utilization in treatment. Autonomy-connectedness is one’s ability to govern their life, including developing and sustaining social relationships (Rutten et al., 2016). Three components of autonomy-connectedness are self-awareness, sensitivity, and a capacity for managing new situations (Rutten et al., 2016). This self-governance is important because of its relation to agency and mental disorders. For instance, high amounts of sensitivity and low levels of self-awareness (derived from agency) are correlated in individuals with anxiety and depression (Bekker & Croon, 2010). Low amounts of autonomy-connectedness are positively correlated with depression and anxiety in individuals (Bekker & Croon, 2010; Rutten et al., 2016). The relation between autonomy-connectedness and anxiety and depression raises a need for effective treatment that can strengthen autonomous qualities in individuals. Effective agentic treatment for individuals with anxiety or depression can include group treatment (called autonomy groups) or individual therapy sessions whose primary aim is to strengthen one’s autonomy, self-esteem, and self-efficacy (Bekker & Croon, 2010; Hungr, Ogrodniczuk, & Sochting, 2016; Piltch, 2016; Rutten et al., 2016). Enhanced understanding of autonomy-connectedness and its derivatives is essential to deciphering the role agency plays in effective treatment.

Autonomy within the context of the self-determination theory (SDT) has also shown to be effective. SDT presents a different
approach to psychotherapy that primarily focuses on motivating people to make goals to change behavior by exploring experiences (Ryan & Deci, 2008). Within the framework of SDT, the construct of autonomy acknowledges the relationship between one’s behavior and their sense of volition (Ryan & Deci, 2008). Ryan and Deci (2008) found that when individuals are given chances to be autonomously engaged in their therapy, therapy will more often result in positive outcomes because clients are more inclined to change their behavior. This process involves a personal, self-recognized responsibility for changing one’s behavior that includes clarification of values and goals and the facilitation of their process of growth and change (Ryan & Deci, 2008). SDT’s foundational goal is to strengthen autonomy and one’s personal sense of volition (Ryan & Deci, 2008). Ryan and Deci (2008) concluded that strengthening one’s autonomy is crucial for successful psychological treatment. Allowing clients to feel more involved and in charge of their personal treatment plan can help reduce symptoms.

Strengthening one’s autonomy can be beneficial in other ways as well. A common frustration of people who are diagnosed with mental illness (particularly depression) is a lack of motivation to be involved with things they typically enjoy. Ryan, Lynch, Vansteenkiste, and Deci (2011) found that the motivation level of a client can be heavily predictive of overall treatment effectiveness. This finding can be disconcerting for someone who is diagnosed with depression because it suggests that clients will most likely have low motivation to seek help. However, Williams, Rodin, Ryan, Grolnick, and Deci (1998) found that autonomy is correlated with a patient’s motivation; as an individual’s autonomy strengthens, their motivation increases, making treatment plans more effective (Ryan et al., 2011). Despite the research that promotes the benefits of strengthening autonomy, many therapists still ignore the benefits. Ryan and Deci (2008) posited that this is partly due to pressures therapists face from clinic directors or insurers who often compel the therapist to urge clients to change behaviors. Still, these pressures are important for therapists to overcome. As therapists seek to strengthen the autonomy of an individual, it can induce an increase in motivation, thereby making treatment more effective.

Alexithymia. Alexithymia, a term included under the umbrella of autonomy-connectedness, contributes to mental disorders. Alexithymia is characterized by the inability to describe or regulate one’s emotions, difficulty in communicating, and having an external locus of control (Hungr et al., 2016; Rutten et al., 2016). An external locus of control is defined as a belief that one’s life and circumstances are a result of mere chance and is completely out of their personal control (Hungr et al., 2016). Those with alexithymia also externalize their cognitions and their health, creating a problem for those with mental illness (Hungr et al., 2016). Alexithymia, like autonomy-connectedness, is heavily related to both anxiety and depression (Rutten et al., 2016). Individuals with these ailments lack the ability to make choices and to govern their life because of their externalized, excessive thoughts.

An individual who has alexithymia is typically impaired in their ability to self-reflect, an important ability related to agency that is critical to be aware of in clinical settings. This is because self-reflection is a primary factor of therapy (Hungr et al., 2016). Individuals confuse what they have and do not have control over, including the belief that therapy will do nothing for them, which renders such treatment ineffective (Hungr et al., 2016). A lack of awareness of agency, specifically inability to self-reflect in individuals with mental illness, results in passive participation in therapy sessions (that often require active participation), limiting what certain therapies can do (Hungr et al., 2016). Research has shown that active participation, or perceived involvement, may improve satisfaction and overall empowerment (Tambuyzer & Van Audenhove, 2015). Empowerment is defined by the World Health Organization as the level of choice and control one has over their life (as cited in Tambuyzer & Van Audenhove, 2015). Effective treatment requires empowerment through autonomy and a better acknowledgment of the inhibiting nature of alexithymia (Hungr
et al., 2016). Therapists who do these things can help clients have a greater sense of responsibility, which allows these individuals to better differentiate areas in their life that they have control over, playing an invaluable role in recovery (Hungr et al., 2016). Recognizing what empowers clients is critical in treatment and recovery.

**Existentialism**

Consideration of existentialism can also be valuable when treating mental disorders. Existentialism is an established therapeutic method based upon philosophy (Vos, Craig, & Cooper, 2015). This philosophy is fundamentally founded upon personal agency and explicitly recognizes issues of humanity, such as meaning, existence, freedom, and relationships (Bartz, 2009; Vos et al., 2015). Typically, a therapist implicitly addresses these concerns, whereas existential therapists openly acknowledge them (Craig, Vos, Cooper, & Correia, 2016). Research has demonstrated that existential thinking, thought revolved around issues mentioned above, may contribute to emotional disorders, including anxiety and depression (Lloyd, af Klinteberg, & DeMarinis, 2015; Winston, Sumathi, & Maher, 2013). If existential thinking contributes to the cause of mental illness, then it should be considered and used in treatment. Just as a biologically induced anxiety is treated with pharmacological treatment, existentialism should be taken into consideration for treatment of mental disorders.

Research of existentialism is limited due to its focus on subjective feelings of patients, making objective scientific research methods less effective (Craig et al., 2016; Walsh & McElwain, 2002). A decreased focus on the objective allows for better understanding of the human experience, but subjective accounts often differ from objective observers, resulting in unreliable data (Walsh & McElwain, 2002). Existentialism’s main goal is not necessarily to reduce an illness’s symptoms or view the symptoms as problems to be solved (which can make research on this type of treatment difficult); rather, it emphasizes helping the client find lost meaning in their lives and accepting anxiety and guilt as necessary and beautiful parts of human existence (Craig et al., 2016; Shumaker, 2012; Walsh & McElwain, 2002). Schneider (2015) argues that traditional methods that merely recondition thought patterns would not make enough of a difference, and that therapists owe it to clients to help them self-explore in a deeper manner. Compared to traditional therapeutic treatments, existentialism is more ambiguous; yet, it can still be effective.

In addition to the above benefits, existentialism has been shown to provide hope and be beneficial to clients in clinical settings utilizing the following sources: theoretical scholarship, qualitative research, case studies, and scientific findings (Walsh & McElwain, 2002). Research by Craig et al. (2016) and Schneider (2016) showed that existentialism generally yielded a decrease of psychopathology and an increase of self-efficacy. In another study, Ståalsett, Austad, Gude, and Martinsen (2010) found that existential treatment resulted in a significant change in symptoms and recovery for 40 individuals who were mentally ill, 29 of whom had major depression (see Figure 1). In addition, Craig et al. (2016) suggested that existential treatment may provide as much benefit as other common therapies, such as cognitive, biological, or humanistic therapy. A notable case study performed by Elliott (2001) involved an individual with high anxiety and depression, among other issues, who showed clinical change on all measures after receiving existential treatment. Findings such as these show great promise for the use of existential treatment in approaching anxiety and depression.

A treatment analogous to existentialism is Viktor Frankl’s logotherapy, a treatment that has also shown promise. Logotherapy focuses on individual’s meanings and values—ideas which Frankl stressed should be the fundamental nature of psychotherapy (Barnes, 2000; Wong, 2015). Rather than solely “eliminating” a disease, logotherapy teaches clients to take responsibility for their own lives, a process that emphasizes what is “right” with an individual rather than what is “wrong” while reducing symptoms of mental illness (Barnes, 2000). If meanings are suppressed or disregarded, the individual experiences inner despair, making life
not worth living (Barnes, 2000). Meaning therapy (MT), a specific subtype of logotherapy, combines logotherapy and existential therapy (Barnes, 2000). Therapists using this treatment method view their clients as agentic beings while emphasizing the importance of the spiritual selves of individuals, or the hidden meanings in the clients’ lives (Barnes, 2000). Both logotherapy and meaning therapy have shown success in treatment (Barnes, 2000). Existential therapy, logotherapy, and meaning therapy all emphasize that there is more to human beings than irregular thought patterns, bizarre behaviors, and chemical imbalances (Barnes, 2000; Wong, 2015). These therapies accentuate meanings that determine the choices we make (Barnes, 2000; Wong, 2015). Acknowledgement of these hidden qualities is what can help treatment be more successful.

Though some research findings have provided support for existentialism, there is evidence against it. One study by Vos et al. (2015) found that the effect of existential treatment for anxiety and depression was not statistically significant; however, they concluded that it was effective enough that existential therapies show promise from which clients may still benefit. One may argue that because of a lack of statistical significance this should not even be considered for anxiety and depression treatment; yet, the article also noted the subjective benefit clients received from existentialism that is almost impossible to measure (Vos et al., 2015). Until recently, instruments to measure and validate existential treatment’s effectiveness were non-existent (Vos et al., 2015). Thus, further research needs to be conducted to utilize these new tools.

**Theistic Existential Therapy**

One method which may benefit clients who consider themselves spiritual is employing a theistic approach to existential therapy. Theistic existential therapy is different from regular existential therapy in three ways: it grants explanatory power for clients who believe in God and agency, provides effective treatment for theistic individuals (specifically, by giving them more resources), and allows therapists to access divine intervention during treatment (Bartz, 2009). Theistic existential therapy also allows therapists to be open-minded toward clients’ spiritual values and helps clients view the hidden values as a benefit rather than a hindrance (Bartz, 2009).

As cited in Bartz (2009), May and Yalom discuss how this type of intervention can help treat anxiety:

> The therapist assists the patient to embark on a course of self-investigation in which the goals are to understand the unconscious conflict, to identify the maladaptive defense mechanisms to discover their destructive influence, to diminish secondary anxiety by correcting these heretofore restrictive modes of dealing with self and others, and to develop other ways of coping with primary anxiety. (p. 73)

This kind of therapy helps clients cope with mental illness by encouraging them to set goals and identify defense mechanisms.

Consequently, theistic existential therapy specifically targets religious persons or those who believe in a higher power. It considers the central aspects and events of life, such as existence, meaning, and death (Eick, 2014). The events mentioned should be important whether an individual is religious or not, as these questions are indirectly supported by empirical data (Vos et al., 2015). For instance, if meaning is disrupted in an individual’s life, anxiety and empty feelings may result (McMahon, 1974). Death of loved ones or fear of death is said to create the most substantial amount of anxiety people can face (Eick, 2014). In a theistic perspective, humans are all moral beings and as such search for a purpose, doing whatever it takes to discover what that purpose is. Because of human’s moral nature, guilt (one of the most powerful emotions) floods humanity’s psyche at the very center, and guilt is a potentially distressing symptom of depression (Bartz, 2009). The aim of a theistic approach is to integrate aspects of spirituality with modern-day therapy to treat anxiety and depression. Combining spirituality with therapy in a balanced way can have a positive effect on depression and anxiety (Eick, 2014). Anything that brings about positive change for mental health is worth considering further.
Additionally, theistic existentialism may be especially helpful in a place like the state of Utah. Utah has the highest rate of mental illness in the United States at nearly 22%, compared to the United States average of 18% (Christiansen, 2014). Many of these illnesses include anxiety and depression and are induced partly by a perfectionist culture (Christiansen, 2014). Taking into consideration all of one’s circumstances, specifically focusing on one’s spirituality, may better help treat these pervasive and prevalent illnesses in this area. Despite the amount of evidence supporting this method, Slife, Stevenson, and Wendt (2010) acknowledged that theistic existentialism is drastically different from the naturalistic counterparts of modern psychology and may be difficult for some to use. Their invitation, however, is for psychotherapists to present this branch of treatment to clients appropriately; a therapist that better understands a client’s needs can successfully treat their client (Slife et al., 2010). Application of this idea is effectively done by recognizing the explicit and implicit aspects of an individual.

**Conclusion**

Agentic treatment that accentuates agency, autonomy, and existentialism can help clients with mental illness on their road to recovery. Understanding the relationship agency has with mental illness is important in understanding individuals. Gantt, Wages, and Thayne (2014) indicated the following:

- Moral agency is not something that one can ‘take or leave’ in the quest to understand human nature and meaning . . . Moral agency is fundamental to human nature and that any psychology . . . that does not admit this fact will not only be inadequate to the task of making sense of human beings, but also profoundly misleading about them. (p. 8)

The ability to choose is part of one’s very existence and overall meaning, and is critical to better understanding human nature and behavior. Because of the lack of understanding of clients’ behaviors, therapists who do not explicitly acknowledge the importance of choice during treatment will not be as effective as therapists who do utilize choice in their practice.

Many questions remain unanswered, despite evidence showing advantages to using agentic treatment. As discussed, agentic-based treatment for anxiety and depression and other mental illnesses has a relatively small amount of evidence-based support, and is difficult to research because of its subjective quality (Craig et al., 2016; Walsh & McElwain, 2002). This creates many challenges in its implementation; however, these difficulties may be worth overcoming. Williams (1999) proclaimed: “No issue takes us closer to the center of our being… No concept in the contemporary social sciences has shown itself to be more resistant to clarity, closure, or even consensus than has the concept of human agency” (p. 117).

Agency is fundamental to who we are. Despite research limitations, this review of agency and similar constructs show that agency is central to one’s overall well-being and is vital in overcoming mental illness. Future research should continue to focus on agency as one of the causes of mental illness and how agency can be used to provide effective treatment. As the effectiveness of choice, free will, and autonomy are further explored, a greater need to utilize them will be apparent.

**References**


Appendix

Figure 1. Report of pre- and post-treatment effects of existential treatment. Existential treatment for 40 subjects with mental disorders (all of whom experience guilt and fear), which included 20 men and 20 women (ages 28-61), 29 of whom had major depressive disorder and nine having generalized anxiety disorder. Symptoms and overall health were improved after treatment (post-treatment was examined one year after). Adapted from “Existential Issues and Representations of God in Psychotherapy: A Naturalistic Study of 40 Patients in the VITA Treatment Model,” by G. Ståalsett, A. Austad, T. Gude, and E. Martinsen, 2010, *Psyche En Geloof*, 21, p. 85.