The Photovoice Process in Stress-Induced Depression: How Giving a Voice to the Unheard Through Pictures May Reduce Stress

Adedayo Okubadejo, Bard College
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*Bard College*
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Senior Project submitted to
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of Bard College
by
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Acknowledgements

This project is dedicated to anyone who suffers from chronic stress and/or depression, but does not have access to treatment for it. The unheard voices of young adults around the world.

Also, dedicated to my parents, my siblings, my extended family members from Nigeria, USA, and London and around the globe.

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Abstract

Depression has been predicted to be the second leading cause of disease worldwide by the World Health Organization. However, many people in low socioeconomic status communities do not have access to the many expensive and inaccessible treatments of depression, such as cognitive behavioral therapy (CBT), antidepressant drugs, electroconvulsive therapy and deep brain stimulation (DBS). Photovoice is a process that provides substantial social support from community members and can increase self-awareness through self-reflection, which both have been shown to reduce stress. Thus, I propose that the Photovoice process can help to reduce levels of stress through increases in social support and self-awareness in untreated patients with stress-induced depression aged 18-25 in low SES communities who do not have access to treatments for depression. A single-blind randomized controlled trial is proposed where the control group will only use the Photovoice technique for a day while the experimental group will undergo the entire Photovoice process over the course of six weeks. It is predicted that participants from low SES communities who undergo the entire Photovoice process through a six week process will yield reduced stress levels associated with stress-induced depression in comparison to the control group. Stress will be measured through cortisol levels from saliva samples along with blood pressure, skin conductance responses to traumatic material and a stress symptom scale. The Photovoice process will be tested as a stress-reduction method for untreated participants from low SES communities dealing with symptoms associated with stress-induced depression until depression treatments become readily available in these communities.
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“Of all of our inventions for mass communication, pictures still speak the most universally understood language.”

~Walt Disney
Introduction

Low Socioeconomic Status Communities

In the modern age of technology, scientists from around the world are making truly great discoveries in a vast number of areas. In the area of clinical depression, there are many treatments that have been discovered to relieve symptoms of depression on both neurological and cognitive levels that have allowed for people to return to the normalcy of their lives. These treatments include anti-depressants, deep brain stimulation, electro-convulsive therapy, cognitive behavior therapy, SSRI's (Selective Serotonin Receptor Inhibitors), MAO's (Monoamine oxidase inhibitors), anti-psychotics, and more. However, there are two major problems, two problems that are greatly undermined in today’s society. One problem is that these treatments are expensive, and the other problem is that they are extremely exclusive to a specific class meaning that they are available in only certain types of communities.

These communities are either high or middle socioeconomic status communities, also referred to as the upper and middle classes. According to the American Psychological Association, socioeconomic status (SES) is the social standing or class of an individual or group, it is often measured as a combination of education, income and occupation, and examinations of socioeconomic status often reveal inequities in access to resources plus issues related to privilege, power and control (American Psychological Association, 2013). Even though some people may say that the problem that I have recently described is only one problem meaning that if something is expensive for someone wouldn’t that mean that it is unavailable to that person? In response to such a question, I would indicate that it is not that simple. The problem described here entails both an economic and geographical problem where the prices of treatments are high because of where certain people live their availability to those treatments are low.
Limited Access to Depression Treatment for Patients from Low SES Communities

Now, at this point, one may ask exactly how expensive are treatments for depression. Are they really that expensive? Well, the truth is depression treatment is expensive even for most middle SES community members in North America. Unlike most developed countries, the United States does not have universal health care. A new study by NAMI (The National Alliance on Mental Illness) has found that the cost for treating depression is three times higher in U.S. citizens with limited access to treatment (Honberg et. al, 2011). In 2011, the annual "out-of-pocket costs" for medication, psychotherapy and other treatment costs averaged $4,312 for those with restricted access versus $1,496 for those with good health insurance (Honberg et. al, 2011). The ironic aspect of this is that those with limited access to treatment are often those with lower incomes. As a result, lower income people pay more for their depression treatment. The study also made several interesting observations involving the population of clinically depressed patients in America depicted in Table 1.
The table presents the findings of the study by the National Alliance on Mental Illness regarding common observations of the depression population in America (Honberg et. al, 2011).

Table 1 displays observations made by the National Alliance on Mental Illness regarding depression. The observations represent the common problems that are associated with clinically depressed patients, such as a shortage of mental health professionals, the incomplete diagnosis of people with depression and a possible increase of self-reported depression by minorities. However, the most crucial observation is that people with depression in states with no mental health equality may have limited access to treatment for depression. This is the predicament that I propose that the Photovoice process will help to address by providing a stress-reduction method for patients who meet the criteria for major depressive disorder and score moderate or high on the stress symptom scale indicating stress-induced depression (Elkin, 1999). Thus, although the depression treatments, such as SSRI’s, MAO’s and deep brain stimulation are great achievements that have been made in the areas of psychology, pharmacology and science in
general, the access of these medications and therapies is an area that has been overlooked and under-assessed. There are few studies that investigate the problem of a lack of access to treat for low socioeconomic status communities, also referred to as low SES communities. And by very few, it is implied that there is little to no research in this area. Little research has focused on the relationship between the SES of communities and geographic access to prescription medications at community pharmacies (Honberg et. al, 2011). People in low SES communities, especially young adults who are just entering into the workforce simply cannot afford the medication and/or treatment options for depression that are available in higher class communities.

The Stress Process in Neighborhood Context:

a. Displays the association between SES and health
b. Individual SES indirectly affects mental and physical health through stressors
c. Stressors move to resources
d. Stressors directly affect mental and physical health
e. Resources, in turn, affect mental and physical health not explained by stressors or individual SES
f. Neighborhood context that affects mental and physical health effects of stressors
g. And of resources

(Amstislavski et al., 2012)
In fact, considering that in modern society a college degree becoming more and more common, a college education is becoming more and more expensive, and the fact that graduate degrees are becoming more competitive; people from low SES communities are at a great disadvantage because they are unable to receive the proper levels of education that lead to well-paying jobs that are necessary to afford such expensive treatment. Low SES communities are commonly associated with lower education. And the lower the educational background the more menial the occupation type and the lower income. Figure 1 shows the stress process in the context of a socioeconomic status neighborhood. The first point (a) depicts that individual socioeconomic status can determine an individual’s health. The lower the individual SES the greater the amount of stressors that an individual experiences. The second point (b) shows that individual SES leads to certain stressors such as mental, physical, and environmental stressors. The lower the SES, the more likely it is for a person’s health status to be lower. The third point (c) illustrates that stressors move to the available resources currently present the neighborhood. Low SES communities are more likely to have fewer resources than higher SES communities.

The fourth point (d) indicates that stressors directly impact an individual’s health. Due to the fact there is a greater likelihood for there to be a greater amount of stressors in low SES communities as compared to higher SES communities; people from low SES communities are more likely to have poorer health. As a result, as shown at the fifth point (e), the resources that are available within a community affect an individual’s health, but this cannot be explained by stressors and individual SES. Lastly, it is shown that in the neighborhood context (f) that can affect mental and physical effects of stressors and of resources (g). Thus, it can be seen how stress travels among both individual SES and neighborhood SES where one can experience stress
on an individual level and also experience “shared stress” with their community members. Both affect low SES community members.

According to one study, many low SES communities are referred to as medication deserts, which are defined as low availability and access to nutrition, medication and health benefits in the statement below:

The community pharmacy is a critical source of medications, health services and health information to residents, and pharmacies are especially critical in socio-economically disadvantaged communities, where access to prescription medications via online pharmacies and to health information and resources is often impaired. The barriers to medication and pharmacy access can be differentiated into two principal groups: economic and geographic. Economic barriers may prevent individuals from procuring prescribed medication or adhering to the provider-prescribed medication regimen due to its high cost and/or lack of medication coverage. Previous studies show that socio-economic factors, such as lack of health insurance and prescription coverage are associated with decreased access to medications, lower prescription medication use, and higher out-of-pocket spending (Amstislavski et al., 2012).

Moreover, healthcare policies are a major concern in low SES communities, but are not always as regarded as priority status by local and national government. There are a number of resources that low SES communities lack in order to ensure members of these communities quality healthcare, which if these resources were readily available, then it could begin a trend towards a higher functioning economy through increased labor and job opportunities. Thus, there is a domino effect where a scarcity of resources results in the amplification of the intensity of stressful situations experienced by community members. The stress from those situations can induce depression, as a result of stress, and depressed workers result in poor performances at work, and poor performances at work result in a lower functioning economy.

Furthermore, certain demographics within low SES communities reveal that there are certain ethnicities that are more susceptible to illnesses than others and, as a result, are more affected by the domino effect mentioned earlier. As Bruce McEwen, the author of The End of
Stress as We Know It, ethnic minorities are more vulnerable to the illnesses associated with allostatic load (2002, p.180). Low SES communities usually are comprised of large demographics of ethnic minorities. For example, McEwen states that, “African-Americans have higher levels of heart disease, obesity, diabetes, and stroke and are also more likely than whites to die of these illnesses;” and in addition, McEwen specifically notes that, “attention must be paid to the daily presence of allostatic load in the lives of many minorities” (2002, p. 180). The term allostatic load was coined by McEwen, which describes the physiological results of a build-up of repeated exposure to chronic stress, and, as a result, activates the body stress response systems particularly in the cardiovascular system (2002). The most important aspect to note concerning allostatic load is the damaging effects that it can have on the body, which lead to disease, and can even accelerate the disease process, which will be explained in greater detail later in the current proposal.

In these low SES communities, there are numerous sources of stress that, as a result, become depression experienced by most of the community members if not all. One of those sources, which are also one of the biggest sources of stress in these communities, is disease within the community. When discussing the disparity of levels of the diagnosis of infectious diseases among ethnic groups McEwen states that:

By the 1970s there were 12 to 17 times as many deaths from infectious diseases among so-called colored people than among whites in South Africa, with up to 85 percent of the colored people’s deaths attributed to tuberculosis (2002, p. 181).

Thus, it is clearly seen that diseases within the community and other health concerns are large sources of stress in their communities, but more importantly the fact that little is done about it makes it even more distressing to members of these communities. In regard to stress-induced
Diathesis-stress models (Slater & Cowie, 1971) of psychiatric condition such as depression suggests that no one factor can account for the apparent complexity of the disorder. Nevertheless, few studies to date have managed to examine the co-action and interaction of multiple determinants such as cognitive vulnerability, environmental stressors and genetic endowment in the development of depressive disorders. It is important for the development of a systematic theory of depression to identify the relative contributions of cognition, social factors, and biological propensity in the genesis of depression (Ingram, 1990, p.18).

Therefore, we can see that in any normal situation with middle and upper SES communities there are multiple contributors to depression and stress, as mentioned in the quote environmental stressors, have large contributions that cause depression. This implies, in the simplest terms, that people in low SES communities, especially young adults and children, must be going through elevated amounts of stress in comparison to the general public. Their levels of stress are “sky high” to put it in common terms, and they cannot do anything about it because they lack the access to the resources that are available elsewhere at a price that they cannot afford as explained earlier. Figure 2 illustrates the many factors specifically, socioeconomic, cultural and environmental, that contribute to stress for all social classes.
In Figure 2, in the center of the diagram it is show that age, sex and hereditary factors, which are all apart of genetics, are the centerpiece of contribution to stress indicating that undergoing there can be a genetic predisposition for undergoing stress. Then after a genetic contribution to stress the second most influential factor are individual lifestyle factors that can either strengthen or deteriorate a person’s health. This is mainly how one chooses to live his or her life. Afterwards, one’s living and working conditions come into play including aspects of where one is located or geographical factors, such as work environment, education, agriculture, unemployment and housing. At this point, the factors that contribute to stress are beyond a person’s control. And lastly, there are the socioeconomic, cultural and environmental factors that are the outside factors that increase one’s accumulation of stress depending on the people and the place that surrounds them in their society.
After considering the complex interactions depicted in Figure 2, one can imagine how much stress the average person from a middle class neighborhood might accumulate stress. However, it is more difficult to imagine the amount of stress that a person in a low SES community accumulates and continues to accumulate stress on a daily basis from stress factors, such as financial insecurity, domestic violence, lack of transportation, food insecurity, homelessness, substance abuse, lack of health care, crime, depression, joblessness, etc. And what is even worse is that poverty tends to continue in a cycle identified as a “poverty cycle” where the socioeconomic, cultural and environmental stressors are passed down to the next generation.

Thus, the question that arises from this is how can stress be reduced in communities where stress is frequent, has a long duration and a great intensity? Even more so, a more economic question arises which is if a relatively inexpensive, alternative method of stress-reduction can be used specifically for untreated patients with stress-induced depression in low SES communities? I propose that there is an unlikely and unheard of stress-reduction method that may be able to yield lower levels of stress after its process has been undergone. A novel technique that was recently developed near the end of the 20th century in which untreated patients with symptoms associated with stress-induced depression can use to identify specific stressors in their lives through photography and lessen the number of stressors through the use of their own voice until treatments are widely available. This technique and more specifically this process is called Photovoice

**Chapter 1: Photovoice, Stress and Depression**

**What is Photovoice?**

Throughout, the process of my proposal, I found it quite challenging to specifically define Photovoice because there are so many definitions and the variety of definition often
confuses people who I have told about Photovoice and how it works. Thus, I have come to the
point where I have chosen to define Photovoice specifically in the context of my grant proposal
and also to illustrate the distinction between Photovoice as a technique and Photovoice as a
process. Photovoice, as described by the creators of the technique and process, Caroline Wang
and Mary Ann Burris, is a process by which people can identify, represent and enhance their
community and themselves through a specific photographic technique (Hamilton, 2012).

Thus, through the definition provided by the creators of Photovoice, the difference
between the Photovoice process and the Photovoice technique is that the Photovoice technique is
a small, but fundamental part of the much larger and more beneficial Photovoice process. It
should be noted that the primary focus in the current proposal is Photovoice as a process, and it
is the process that I will soon describe that I predict will help reduce stress in untreated patients
with stress-induced depression. As a result, the two elements provided by Photovoice that I
predict that will be responsible for the stress-reduction in the patients are social support and self-
awareness. These are the two elements that will, as I predict, help to significantly reduce stress
over time during and after the Photovoice process due to the fact that previous research has
shown both social support and self-awareness as essential components in stress-reduction,
especially social support. Photovoice provides social support through community participation
from members of the participant’s own community, and it also provides an increase of self-
awareness through identifying stressors and through self-reflection techniques during the
Photovoice process. Thus, I propose that the Photovoice process can be used as a stress-reduction
method for young adults in low SES communities who are diagnosed with stress-induced
depression, but who do not have access to typical treatments of depression until these treatments
are widely available in their communities.
Example of Photovoice and How it Identifies Stressors (Neighborhood Stressors): The following is another example of how Photovoice can be used to capture stressors through pictures and how the participant expresses his or her stress (this is a specific example of an individual stressor (this is a specific example of an environmental stressor that is commonly found in low SES communities) (Ritsher, J. B., Ottingam, P. G., & Grajales, M. (2003).
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

In order to investigate deeper into understanding Photovoice, it must be described how it works. Photovoice works as a combination of photography and grassroots social action used in public health, community development and education where photography is used as a communication tool. A more general description of Photovoice is that it is “talking with pictures” whereas there is a collaborative combination of text and images. Furthermore, Photovoice includes photo-elicitation, inserting a photograph into a research interview for self-reflection, and it involves that providing a unique perspective from each participant in the process of data collection and research gathering.

As shown Figures 3 and 4, Photovoice has built a good track record of increasing allowing people with diseases to deal with the stigma of their disease allowing a process of stress relief. In Figure 3, an example of how Photovoice is used for stigma is provided where a participant who was a part of the psychiatric research on the internalization stigma of mental illness takes a photo of a water drain in order to convey the amount of stress he has undergone. This is mainly an example of how Photovoice is used for individual stressors. However, Figure 4 depicts how Photovoice is used for neighborhood stressors that are shared by the entire community. In figure 4, the photograph was taken by the community members of Lincoln County in Southern West Virginia during a Photovoice project. The text underneath the image describes the amount of stress that the community members have to undergo almost every time it rains where there is an accumulation of trash, a lack of water sanitation, and a lack of a bottle deposit in the state of Virginia. Thus, by looking at Figures 3 and 4, it is now apparent how Photovoice can be used to identify stressors both on an individual and neighborhood level where stress is shared. Also, note that community stigma against one person can lead to individual stress as depicted in Figure 3.
How Photovoice Has Been Used Around the World

In order to truly grasp the origins of Photovoice it must be stated exactly where Photovoice came from and how it was invented. According to the Photovoice Hamilton website, created by the Community Centre for Media Arts, Photovoice is described as a participatory photography for social change which was, as stated in the article, “originally developed in China in 1992 by Caroline C. Wang of the University of Michigan and Mary Ann Burris, program officer for women’s health at the Ford Foundation” (Hamilton, 2012). Also, according to Photovoice Hamilton, it was created as tool for women in the rural areas of the Yunnan Province of China to directly influence the policies and programs that affected their communities (Hamilton, 2012).

Thus, Photovoice is typically used as a community effort to help make changes in the communities of its users through social support and self-reflection. In the current grant proposal, Photovoice will be used to stress-reduction rather than for influencing policies and programs concerning public health. The first Photovoice project was conducted in China, and now it is conducted throughout the world. Since its inception, Photovoice has been a successful model that has been globally expanded with techniques such as, photo-elicitation and digital storytelling, which allow for often overlooked and underprivileged individuals to provide an insight into their communities through visuals that promote social change and health care reform. Once again, this is how it is typically used, and, in the current grant proposal, the focus is stress-reduction. It is what Photovoice provides, as self-reflection and social support, provides a basis for stress-reduction.

Now, it will be explained in further detail of Photovoice works and exactly how one would use Photovoice as a tool for stress-reduction for people experiencing individual stressors.
or community stressors. Photovoice has many objectives, such as increasing self-awareness through self-reflection, increasing social support through community participation, spreading the awareness of a disease, capturing the stories of community members, and providing better insight into more informed decisions regarding healthcare. However, in the current grant proposal the main objective is stress-reduction through an increase of both social support and self-awareness. However, it is important to know what Photovoice is typically used for. In order to understand just that, a Photovoice mission statement is provided to give a clear description of Photovoice’s use in the world in the following statement:

Photovoice’s vision is for a world in which no one is denied the opportunity to speak out and be heard. Photovoice’s mission is to build skills within disadvantaged and marginalized communities using innovative participatory photography and digital storytelling methods so that they have the opportunity to represent themselves and create tools for advocacy and communications to achieve positive social change. Working in partnerships with other charities, NGOs and community organizations Photovoice designs and delivers tailor-made participatory photography, digital storytelling and self-advocacy projects for socially excluded groups. Our pioneering approach brings together the arts, media, development and social change agendas to work with hard-to-reach groups on projects that give voice, build skills, provide platforms for advocacy and work towards sustainable change (Daw, 2003).

In a typical case, the primary goal of Photovoice is to provide better insight into the healthcare reform of the community that uses the technique; specifically for health care policy makers and the healthcare decision making process. However, in the current grant proposal, the main goal of the Photovoice is to provide a process that promotes self-awareness through self-reflection and social support through community participation. Photovoice’s has the ability to empower participants particularly in low SES communities where the members are depressed, as a result of the stress caused by the conditions of the community itself and their perceived state of hopelessness. Thus, the fact that Photovoice has been described to lead to empowered participants may be a result of increases in social support and self-awareness.
In order to further understand how Photovoice is typically used, an example of Photovoice in a case study can be examined. In the first-ever border Binational Photovoice project, *Voice and Images: Tuberculosis Photovoice in a Binational Setting*, Photovoice is described as, “… a Participatory Action Research (PAR) strategy that provides a camera to disenfranchised populations affected by a particular health problem” (De Heer, Moya, Lacson, 2008). The TB case study is not at all a model study to represent or support the current grant proposal, but it does provides an example of how Photovoice can be used as a communication tool to increase the awareness of lack of treatment and stigma.

The TB is not a model study for the current grant proposal because the study has no statistical findings. The researchers in the TB study claim to have several important findings such as, an exposition of how each individual and organization could prevent and eradicate Tuberculosis (TB), qualitative person benefits to the participants in a local community-based organization in Ciudad Juarez and two non-governmental organizations in Tijuana and Mexico City who were apart of the Photovoice method for TB and HIV/AIDS, and claimed that the TB study improved the participants quality of life with a 100% adherence to treatment and the first-ever support group for individuals with TB. The researchers of the TB study also state that Photovoice may have contributed to healthy changes among the participants such as increases in positive attitudes, possibly reflecting positive changes in self-esteem and self-efficacy. However, the major problem is that they did not even attempt to measures any of these claims. They did not use any self-reported scales, and they did not any take quantitative measures that would indicate healthy changes, as a result of the TB participants undergoing the Photovoice process. Another prime reason why the TB study is not a model study for the current grant proposal is that the researchers based the change of perspective of one participant, as seen in Figure 5, as
support of their claims to improvements in quality of life, self-esteem and self-efficacy (De Heer, Moya, Lacson, 2008, p. 73).

In Figure 5, a Photovoice sample from a TB Photovoice participant named Rachel is shown. However, this is only one participant. The researchers did not mention any other participants who showed a change in perspective and they certainly did not measure their claims of healthy changes. Thus, the researchers based their unproved claims on the suggested positive changes of one participant and, as they continuously noted, they did not measure anything in their experiment. The purpose of mentioning the TB study is that it is an example of how Photovoice is typically used around the world to increase the awareness of TB stigma and, in this case, it was conducted in two different countries hence the term ‘binational’. And the main point of the photograph in Figure 5 for the purpose of the current grant proposal is to indicate another example of how a participant takes a photo of a stressor and then add text to the photo in order to

**Figure 5**

*Change in Attitude of Participant in TB Study:*

*“Freedom”*

“Burning this mask was very important to me. I wore it for several months and it was very painful. My peers didn’t know what my face and smile looked like. When I burned the mask, it was like getting rid of the stigma (associated with Tuberculosis). I felt free.”
convey how Photovoice can be used to identify an individual stressor and then better deal with the stressor. Another important point to the TB study is that Photovoice provided the first-ever social support group for TB patients in the local areas of Ciudad Juarez and two non-governmental organizations in Tijuana and Mexico City. Thus, if the researchers used self-esteem scales and measured stress indicators then this could have supported their claims because social support has been shown to increase oxytocin (love hormone) and self-awareness has been shown to reduce cortisol (stress hormone), as it will be addressed in great detail later in the current proposal. Although it is expected that Photovoice will increase the awareness of a lack of depression treatment in the current grant proposal, increasing awareness is not the focus of the current study, as it was in the TB study. The focus is stress-reduction through the Photovoice process that provides social support and self-awareness in which both have been shown to reduce stress, and it will be explained in further detail later in the current proposal. Thus, it has been illustrated how Photovoice is typically used.

*How the Use of Photovoice in the Current Grant Proposal will be Different*

My senior project will determine if untreated patients with stress-induced depression show signs of stress-reduction as a result of undergoing the Photovoice process using stress indicators, such as blood pressure levels, cortisol levels, and skin conduction levels, which all will be explained in great detail later on. I predict that this will occur because of two predominant elements that are available within the Photovoice process: social support and self-awareness, which have both been shown to reduce stress, as it will soon be seen. Photovoice has many components to it, and I had to filter through those components in order to focus on how Photovoice can be used for stress-reduction purposes. Thus, it is important to document which components of Photovoice will not be used in the study. This will provide a clear description of
the focus of the current grant proposal by revealing what is not the focus, and it will provide further uses of Photovoice that is used in different fields such as sociology, education and public health around the world.

Although Photovoice is primarily used to identify significant impacts on healthcare policy, I will not be using Photovoice to identify its impact on healthcare policy because it simply shows the success of lobbying efforts. Thus, the effectiveness of Photovoice in healthcare policy and lobbying efforts is not the focus of the current grant proposal. In addition, it must also be noted that due to the fact that there is a significant possibility that the final steps of the Photovoice process where the data collected is presented to a board of officials may cause a significant amount of stress for some of the participants and may skew my results, this portion of the Photovoice process will be not conducted in the current grant proposal. Additional reasons include the fact that catering will be required in order to recruit certain healthcare officials, which would add unnecessary additional costs for the current proposal.

Although the presentation portion of the Photovoice process to public health officials will be excluded from the current grant proposal, it still can be used to implement changes within low SES communities, such as increased availability of depression treatment, as a result of Photovoice’s ability to increase the awareness. It is important to note that in the typical use of Photovoice, as a visual participatory method, Photovoice’s purpose is for healthcare policymakers to better see the problems within the community through the very eyes of the people who face those problems. In the typical sense, Photovoice addresses the vital issues regarding an inaccurate representation of low SES communities, the failure of some healthcare policies, the cognitive deterioration of people within low SES communities, and issues of community development. Thus, Photovoice, in the typical case, has many applications, and it can...
do a lot for communities and its members. However, there are certain aspects that Photovoice
does not have. In order to illustrate these aspects, Table 2 categorizes the pros and cons of
Photovoice. Some of the pros are very simple and straightforward, but the most important pros of
Photovoice are that it has a tangible output, especially in low-income areas, it can be tailored to
any community, it provides a snapshot of an area and the issues and/or stressors within the area
in order to commence a positive change, it provides social support to participants with individual
stressors through community participant, and it allows participants to think differently about how
they view themselves, their family and their community.

These are many of reasons why the current grant proposal suggests that Photovoice may
be able to reduce stress in participants with stress-induced depression. However, there are some
cons to Photovoice that are significant challenges such as the facts that Photovoice is time
extensive, it requires commitment and trust from participants, it requires deep thought and self-
analysis, and that higher quality cameras are obviously more expensive. However, in the current
grant proposal, high quality cameras will not be needed because computer resources will replace
the necessity for them. Thus, stress-reduction, in the current proposal, is predicted to be
attributed to social support through community participation, and increasing self-esteem through
self-reflection and self-awareness not through the quality of the equipment.
### Table 2

<table>
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<tr>
<th>Pros of Photovoice</th>
<th>Cons of Photovoice</th>
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<tr>
<td>- You don't need to worry about literacy issues.</td>
<td>- Getting the cameras and making sure they don't break is difficult.</td>
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<td>- Provides social support through community participant</td>
<td>- The Photovoice process is time extension and requires commitment from the participants.</td>
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<td>- Anyone can participate.</td>
<td>- Using disposable cameras is okay, but film quality isn't great and using real cameras is more accurate.</td>
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<td>- Allows community members to show how they view their community.</td>
<td>- Although Photovoice is empowering, community members must trust the process.</td>
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<td>- Can be a very powerful visual presentation.</td>
<td>- People have all different levels of experience with cameras--some might have no idea what to do while others may not need any instruction on taking photos.</td>
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<tr>
<td>- Can be used to make real changes.</td>
<td>- Getting people (especially youth) to think of pictures as concepts is really difficult. This may be easier with adults, but it takes some 'thinking outside the box' which can be hard to bring out if that is not typically part of their schooling (most of the time it is not).</td>
</tr>
<tr>
<td>- Anyone can take at least one good picture.</td>
<td>- Requires staffing and the coordination of participants.</td>
</tr>
<tr>
<td>- Allows people to think differently about how they view themselves/family/community, etc.</td>
<td>- If photos are glued onto a larger poster type presentation, it can be difficult to store and protect (may need photocopies taken for storage/distribution).</td>
</tr>
<tr>
<td>- Having a tangible output can be very exciting, especially in low-income areas.</td>
<td></td>
</tr>
<tr>
<td>- It's very empowering to be the voice of your community through photography.</td>
<td></td>
</tr>
<tr>
<td>- It can be tailored to use in any type of community.</td>
<td></td>
</tr>
<tr>
<td>- Provides an alternative means of expression which may help include those who are more visual than literate.</td>
<td></td>
</tr>
</tbody>
</table>
After considering the pros and cons of Photovoice, we can easily see what it can and cannot do. Thus, the primary and only focus of the current grant proposal is the psychological implications of Photovoice in terms of stress-reduction (something that Photovoice may be able to do, but has not been shown to do so yet). Its influence in healthcare policy has already been greatly demonstrated, but this is an unnecessary component of the grant proposal. In addition, the exhibition part of the process may actually increase stress response because of the perceived

**Pros and Cons of Photovoice:** The table above depicts the pros and cons of Photovoice by highlighting the strengths and weaknesses of both the Photovoice technique and the Photovoice process Wang, C., & Burris, M. A. (1997).

*Note: The pros of Photovoice outweigh the cons of Photovoice.*

- Allows detailed information to be collected from individual participants.
- Provides a snapshot of an area or issue from which to develop indicators and to gauge changes/responses.
- Can easily be used in the media (print/television/interactive audiovisual technologies).
added pressure to perform. Thus, this portion of the Photovoice process will be omitted in the current grant proposal.

*What is Stress?*

The terms “stressed out” and “stressors” are terms that are thrown around in modern society. We all at complain about how stressed we are, and the word stress is a part of our everyday language, but who is responsible for the word stress? Who was the first to research, examine and coin the term stress. In the 1930s, it was Hans Selye, a Hungarian scientist, who introduced the word to the English language (McEwen, 2002). Specifically, he defined stress as the nonspecific response of the body to any demand for change (McEwen, 2002). Although stress is usually negatively perceived, stress plays both a positive and negative role in our lives and stress is absolutely necessary for our survival. This is where the term eustress, a term also coined by Selye, which is used to define good stress or healthy stress that gives one a sense of fulfillment (McEwen, 2002).

After defining stress and finding that it is essential to us all, the question that arises is how much stress is good stress and how much is bad stress? In terms of exact quantifications, we do not know the exactly how much stress will be beneficial to our health; however we do know that too much stress is bad for us and that a moderate amount of stress is good. Like most properties, if not all things, too much is never a good sign; thus stress, like most properties needs to be accumulated in moderation. This is where the term allostatic load comes in, which was coined by Bruce McEwen, a neuroscientist, in 1933. The term allostatic load represents the total, combined burden of physiological stresses (such as high blood pressure) that an individual lives within and accumulates over time (McEwen, 2002). Thus, a high allostatic load increases the risk
of diseases such as a heart attack or hypertension. Thus, we know that a higher allostatic load is bad for your overall health and that a lower allostatic load is relatively good for your health.

*How Does Stress Work in the Body and the Brain?*

In order to explain how stress works in the body and brain, Selye once again has made a good contribution to the understanding of stress and how it works. This significant contribution is his general adaption syndrome (GAS), which refers to the body’s reaction to stressful situations, which goes through a series of three stages: alarm, resistance, and exhaustion that gradually increase the chances of developing psychosomatic symptoms (McEwen, 2002).

Figure 6 depicts how Selye’s framework for general adaption syndrome works in context of a stressor. In Figure 6, stress-response pattern that was proposed by Hans Selye is showed that consists of three stages: alarm, resistance, and exhaustion. During the alarm stage, the body mobilizes its resources. During the resistance stage, the body copes with stressors by providing a resistance against the stressor. During the exhaustion stage, the body’s reserves are depleted, and it can no longer resist the stressor. Thus, the lesson learned from the diagram is that the body’s resistance to stress does not provide defense for long before exhaustion occurs.
Hans Selye’s general adaption syndrome is able to give us a good description about how the body responds, but it does not give us a good description about how the brain responds to stress. In order to understand how the brain responds to stress, we need to go on a neurological level, the biological basis of stress. Through this we can come to understand the neurochemical underpinnings of stress, how the glands send signs to each other, and how which brain structures are involved. We must understand the steroid hormone behind stress called cortisol. Cortisol is what is called a stress hormone that is produced by the adrenal glands. The function of cortisol is that it increases blood sugar, suppresses the immune system, aids in fat, proteins and carbohydrate metabolism, and it stimulates the liver to generate glucose, a very important, but simple sugar molecular that is a vital source of energy and fat (McEwen, 2002). Cortisol is released from the adrenal glands in the bloodstream during moments of stress, and it is mainly used in the stress response, which is illustrated in the Figure 7 of the human brain and body.
In Figure 7, it is shown how cortisol gets into the bloodstream via the hypothalamus sending the corticotrophin releasing factor to the pituitary gland, which responds by secreting adrenocorticotropic hormone. The release of ACTH triggers the adrenal glands to release cortisol during the stress response. Thus, in order for the body to properly react to stress that is present in the environment cortisol is an essential component and the central mechanism of the stress response. Now, that we know that cortisol is the main ingredient to stress experienced in the body and underwent in the brain, and since we also know that it is distributed in the bloodstream, we can dig deeper in the processes that are responsible for stress response. First, we can start with the more well-known system that is involved in the stress response and that is the autonomic nervous system (ANS). The ANS is located in the peripheral nervous system which contrasts to the central nervous (CNS) where the brain and spinal cord are located. The functions are of the ANS involve involuntary functions such as heart rate, blood pressure, digestion, and sweating. This is the part of the nervous system that regulates the body’s
internal environment and carries sensory signals from organs to the CNS. Thus, during the stress response the sympathetic nervous system, which is the division of the autonomic nervous system, arouses the body, and it mobilizes its energy in stressful situations by initiating the well-known fight or flight stress response during stress. This is where one either is ready to fight a threatening stimulus or run from it.

**Figure 8**

[Diagram of the HPA Axis]

**The HPA Axis and Cortisol as a Negative Feedback Response:** The diagram illustrates the Hypothalamus-Anterior Pituitary-Adrenal Cortex (HPA Axis) Response to Stress: Hypothalamus activates the release of CRH, which stimulates pituitary to release ACTH, which stimulates the adrenal gland to release cortisol. The negative feedback loop represents that the cortisol is a counteractive response to the stimulation of the hypothalamus and the anterior pituitary gland (Nauman, E. 2009).
In Figure 8, is an illustration of the HPA axis (Hypothalamic-Pituitary-Adrenal pathway), and it describes how the stress response is a negative feedback loop (Nauman, E. 2009). It has already been described how cortisol gets into the bloodstream, and it is important to note that, as depicted in Figure 8, the process occurs in a negative feedback loop where cortisol is a counteractive response to stress thereby lessening it in opposition to a positive feedback loop where the stimulus would be intensified. But there is more to the stress response. However, the ANS is not responsible for releasing cortisol into the bloodstream. There is another side to the story of stress. A side that is lesser known than the ANS probably because it reacts slower to a stressor than the ANS which needs to act very fast in dire situations. The other system involved in the stress response is the hypothalamus-pituitary-adrenal axis, referred to as the HPA axis. The HPA axis is a major neuroendocrine pathway that is crucial in the stress response by releasing cortisol that acts as a negative feedback mechanism to counteract stress. By negative feedback it is implied that the stimulus is lessened, and it is counteracted, in contrast to positive feedback where the stimulus is intensified. Figure 8 illustrates how the HPA axis releases cortisol as a negative feedback mechanism. The stress response in the HPA axis begins with the hypothalamus by release corticotrophin releasing hormone (CRH) to the anterior pituitary gland, which releases the adrenocorticotropic hormone (ACTH), to the adrenal cortex that produces the chemical stress hormone cortisol (CORT).

Prior Research on Stress-reduction using Social Support and Self-Awareness

Although, as it has been mentioned earlier in the current proposal, that Photovoice has been shown to increase the awareness of diseases, and it has successful lobbying efforts in public health policy, there is no research, that I have found, where a quantified experiment involving Photovoice and stress was conducted. This does not imply that the current grant proposal is
invalid. It simply means that the current grant proposal is the first quantified experiment using Photovoice. All research that is present in databases today started with an experiment that “blazed the trail”. This will be one of those experiments. In order to support the predicted findings of the current experiment and to support the justification of the Photovoice process as a psychological experiment two articles will be provided to exhibit how social support and self-awareness has been shown to reduce stress. Both social support and self-awareness are both accessible through Photovoice where social support is greatly accessible through community participation (reverse engineering stigma to social support) and self-awareness is improved through self-reflection assessments and interview, which are essential components of the Photovoice process.

The first of the two experiments that conducted research on stress-reduction using social support and self-awareness was a placebo-controlled, double blind study involving 37 healthy men exposed to the Trier Social Stress Test conducted by Markus Heinrichs, Thomas Baumgartner, Clemens Kirschbaum, and Ulrike Ehlert (2003). Social support has already been shown to be associated with decreased stress responsiveness and this study was designed to determine the effects of social support and oxytocin on cortisol, mood and anxiety to psychosocial stress in humans (Heinrichs et al., 2003). The participants were randomly assigned to receive intranasal oxytocin, a hormone responsible for sexual reproduction (referred to as the “love hormone”) that has been shown to increase with bonding and physical contact, measured in 24 IU (International Unit) or were given a placebo 50 minutes before stress. The participants either received social support from their best friends during the preparation period in the experimental group or did not receive social support at all in the control group. The experiments
found that salivary free cortisol levels were suppressed by social support in response to stress (Heinrichs et al., 2003).

When the experiments of the social support double-blind study compares the pre-stress and post-stress anxiety levels oxytocin was found to have anxiolytic effects that inhibited anxiety, as a result of social support. Thus, social support has a biological basis just as stress does. The biological basis of stress is measured in cortisol and the biological basis of social support is measured in oxytocin levels. In fact, the researchers also found that when oxytocin and social support are combined the combination yields the lowest cortisol concentrations in addition to increased calmness and decreased anxiety during stress (Heinrichs et al., 2003). Thus, due to the fact that Photovoice increases social support by involving members of an individual’s community through community participation instead of feeling isolated in one’s community one may feel as if they have fully integrated into their community through the Photovoice process and, as a result, show signs of stress-reduction.

The second of the two experiments that conducted research on stress-reduction using social support and self-awareness was a single-blind randomized controlled trial that was conducted by J. David Creswell, Hector F. Myers, Steven W. Cole, and Michael R. Irwin (2009). The purpose of the present study was to follow-up an initial pilot study of mindfulness-based stress-reduction (MBSR) in HIV-1 indicated that exhibited that mindfulness mediation training has the ability to impact immune system function (Robinson et al., 2003). However, the study did not assess the markers of HIV-1-pathogenesis, such as CD4+ T lymphocytes and HIV viral load. Therefore, the current study followed the pilot by conducting a single blind randomized controlled trial. The purpose of the experiment was to test whether an 8-week MBSR program buffers CD4+ T lymphocyte would decline in a community sample of HIV-infected adults.
Since mindfulness mediation training intervention has already been shown to reduce stress and improve self-reported health outcome in a variety of patient population (Brown et al., 2007), the hypothesis of the current experiment stated that the 8-week MBSR program would specifically buffer CD4+ T lymphocyte declines in a community sample of HIV-1 infected adults (J.D. Creswell et al., 2009).

The participants of the study were a community sample of 48 HIV-1 infected adults that were randomized and entered in treatment two groups: an eight week MBSR or a one day control stress-reduction seminar. All procedures were approved by the UCLA institutional review board (IRB). The eight week MBSR program included eight weekly 120 minutes group sessions, a day-long retreat in the seventh week, and daily home mindfulness mediation practice whole the one-day stress education MBSR program was a condensed version of the 8 week program, which lasted 6 hours (J.D. Creswell et al., 2009). Afterwards, a post-intervention assessment of CD4+ T lymphocyes levels were conducted for all participants within two weeks of the eight week program. A good critique of the experiment was that the participant pool was fairly diverse yet, in terms of gender, males far exceeded the number of females and their sample size was fairly small.

The results of the experiment indicated that participants in the 1-day control seminar showed declines in CD4+ T lymphocyte counts whereas counts among participants in the eight week MBSR program were changed from baseline to post-intervention (time x treatment condition interaction, p = .02) (J.D. Creswell et al., 2009). The researchers of the study state that their results may imply that mindfulness meditation training may have direct effects on CD4+ T lymphocyte distributions or that it may be explained in part through reductions in HIV RNA levels. More critiques of the study include the major limitation of the study include that there
were high attrition rates, there were no long-term follow-up assessments, and there was an insufficient sample size to determine if mindfulness mediation training impact HIV-1 RNA levels as indicated by the researchers.

Although the mindfulness mediation study did not measure stress and rather measured counts of CD4+ T lymphocytes, it has already been shown that mindfulness mediation training has stress-reduction benefits in various patient populations (J.D. Creswell et al., 2009). Further, recent evident suggests that MBSR may reduce total daily salivary cortisol output at follow-up (J.D. Creswell et al., 2009). It has also been found that psychological stress may account for the variability in treatment outcomes of HIV-1 infected patients, as animal and human studies have demonstrated that stress accelerates HIV-1 disease pathogenesis and impairs the biological impact of antiretroviral treatment (J.D. Creswell et al., 2009). Thus, mindfulness mediation, as it has been shown in previous experiments, has evidence to support its usefulness for stress-reduction, as a result of increasing self-awareness. The researchers also implied that they results indicated that mindfulness is useful in stress-reduction because of its ability to increase self-awareness. Self-awareness is where mindfulness mediation training and the Photovoice process have common ground. Just as mindfulness mediation training increases self-awareness in order to reduce stress over an 8-week period, in the MBSR study, the Photovoice process promotes self-reflection in order to increase self-awareness over a 6-week period, in the current proposed experiment. Thus, the two experiments on social support and on self-awareness can be used to support the predicted findings of the proposed experiment. This will be shown later in the current grant proposal since both social support and self-awareness, which are both provided by Photovoice through community participation and self-reflection, have been found to lead to stress-reduction.
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

Depression

Now that we have understood stress and how it works, and a framework of previous research for the current grant proposal has been provided, we can begin with the assessment of depression and how stress is related to depression. Depression is a very debilitating mental disorder where one can feel powerless, helpless, and that circumstances are unchangeable (Guidi, Fava, Bech, Paykel, 2011). As a mental illness, it discourages action, reduces interest, interferes with everyday life and can become life-threatening, in terms of lifestyle choices that can deteriorate overall health conditions (Guidi, Fava, Bech, Paykel, 2011). According to Dr. Rudy Nydegger, author of *Understanding and Treating Depression*, states that:

> Depression is an equal opportunity disorder ---it can affect anyone of any group, any background, any race, any gender, any age ---anyone. It is the great leveler of all groups that can take the greatest and the smallest of us all and it reduce us to the pain and nothingness that is depression (2008).

However, feeling depressed and being diagnosed with a depressive illness are two completely different circumstances. Even more so, stress-induced depression may be an easier route to locating sources of depression by finding sources of stress. I became interested in stress-induced depression after attending Andrew Solomon’s “Inspired by Melancholy: The Creative Mind and Its Pain” event at Bard College where he discussed links between creativity and depression. I had already researched Photovoice prior to the event, and now I envision the Photovoice process as a creative, novel method for reducing stress in untreated patients with stress-induced depression in low SES communities. As mentioned earlier in the paper, poverty is usually found in cycles where the impoverishment is passed down from generation to generation. Similarly, depression has been observed to occur in cycles.
Depression mainly operates in cycles where the person who is clinically depressed finds it hard to escape the cycle of depression. Figure 9 illustrates the cyclical nature of depression and how depression works. As it can be seen in Figure 9, a lot of the different parts of depression in the cycle interact with each other, but each eventually leads to an impairment of basic needs such as relationships, exercise, goals, etc. The cycle depression with the emotionally arousing rumination where feels intense emotions of despair and negative thoughts over and over again. Then, as it can be seen in the red-shaded pathway, emotionally arousing rumination lead to over dreaming, tiredness caused by oversleeping, and depressive thinking styles that further fuel the rumination of emotions. This is the key path of the depression cycle. Then throughout the rest of the cycle,
over-dreaming leads to tiredness then impaired motivation, then either impairs basic needs quickly to later on after fewer pleasant experiences, reduced serotonin levels, and, as a result, increased sensitivity to pain.

There are certain kinds of people who are more likely to become clinically depressed than others. Women are twice as likely as men to develop depressive illness along with people who are facing severe or multiple stresses, especially young people including children and teens (Guidi, Fava, Bech, Paykel, 2011). When people from low SES communities are experiencing multiple stressors they can feel as if they are powerless. When they are unable to change their situation then they might feel as if they have no control over their lives and, as a result, begin to give up on life. Furthermore, when health care policy-makers make decisions that either change very little about the health issues affecting the people in the community or change nothing about the circumstances concerning health care reform in the community, in areas where health care is of a major concern, the number of stressors increase and, as a result, levels of stress also increase. It is proposed in the current grant proposal that as the number of stressors increases and the number of clinically depressed patients increase there is still a lack of treatment available for those in low SES communities, and this is where the Photovoice process can be used as a temporary bridge and an advocate for more widely available depression treatment in these specific communities.

What exactly is clinical depression? And who is most likely to suffer from depression? According to the American Psychiatric Association’s (APA) *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision (DSM-IV-TR), symptoms of depression include the following: a dysphonic mood and a lack of interest or enjoyment in things formerly found to be enjoyable, difficulty with sleep in respect to either problems falling asleep or staying
asleep (insomnia) or over-sleeping (hypersomnia), low energy and/or activity level, loss of appetite resulting in weight loss or even thoughts of suicide (Nydegger, 2008). Depression is a significant and serious mental disorder that affects many people all around the world in all age groups and gender groups. In fact, it has been projected by scientists, psychologists, and medical doctors that depression will be the second largest killer in world after heart disease by 2020 (Murray, 2005). However, the worst aspect of the disease is the fact that the disorder is more often than not misdiagnosed or not diagnosed at all.

According to Nydegger, several studies have demonstrated that the rate of mental disorders, including depression, is inversely related to socioeconomic status (SES) (2008, p.35). Therefore, this indicates that the higher a person’s net worth the less likely that they are to be depressed and vice versa. In low SES communities, where unemployed is usually high, SES is usually low, and public health concerns are extensive, we can see how depression is more than prevalent in poorer areas. In terms of stress-induced depression, to elaborate on earlier points, there are numerous stress factors that contribute to depression, especially high levels of violence, high unemployment levels, large amounts of debt and more. According to the WHO (World Health Organization), about 80% of the 50 million people negatively affected by violent crime, civil war, disasters, and displacement around the world are women and children making them more vulnerable to depression (Nydegger, 2008 p.35). Thus, depression is more common in areas where there are more reasons to develop depression and these areas are in low SES communities, usually in inner city locations, such as Los Angeles, New York, Bard College and Miami regarding areas in the U.S.
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

Treatment for Depression

Thus, depression is a serious issue which is more commonly found in people who have more reasons to be stressed out, particularly people who find it difficult to rid themselves of their worries or reduce their stress levels and, as a result, of their inability to rid themselves of those worries, they find more reasons to become depressed (Morgan, 2009). Depression will not be measured in the current study because it is very difficult to measure it as Nydegger depicts in Understanding and Treating Depression:

Awareness of the complexities and the problems that accompany depression is a step in the direction of understanding how to approach the treatment and care of depressed individuals ---- it is never a simple issue (2008, p.23).

This is precisely why stress-induced depression is taken in account due to the fact that Photovoice can be used to identify the multiple sources of stress in low SES communities. This is a crucial step that needs to be taken beforehand in order to understanding how directly address the specific types of stresses presented in the environment. Who is more likely to experience depression and how many people are clinically depressed? Foremost, it is important to note that the current grant proposal will be focusing on depression in low SES communities in America only. According to Nydegger, as stated in Understanding and Treating Depression, “nearly 19 million American suffer from depression, which leads to significant costs for victims of depression and their families, friends, work colleagues, organizations in which they work and function, and even society as a whole” (p. 31, 2008).Thus, depression affects a large number of people in the American population and is a significant disease. In fact, the mental disorder affects our health care systems, our economy, and social relations in society. As Nydegger has stated:

Although there are a few estimates, it is difficult to calculate the total cost of depression within our health care budget for two reasons: First, depression is not always recognized
by a doctor or other health professional; these cases may never be recorded, nor the cost or impact realized. Second, because many (probably most) people experience depression with coexisting or comorbid medical or psychological conditions, they may be receiving treatment for a different disorder even if the depression could be identified as the primary problem (Nydegger, 2008).

Thus, it is difficult to even identify people who are depressed even though many people in America are clinically depressed, and this makes the whole epidemic of depression even more difficult to handle. Depression is a component of the current grant proposal; however, stress is the focus of the current grant proposal, specifically stress-induced depression. Even though depression is a complex disorder that cannot be easily traced back to its source, much research has been conducted on depression and clinical depression is fairly well understood considering the wide variety of treatment available for depression. It is the fact that those depression treatments are very expensive and inaccessible for low SES community members that is the problem with depression as a clinical disorder. Stress is less understood, and it needs to be further understood particularly, in terms of stress relief, and how stress leads to mental illness.

In terms of prescribed psychiatric drugs or psychotropic medication, these treatments can only give temporary relief from the symptoms of a mental illness such as depression, and it can cause also lead the patient to drug addiction, withdrawal and/or dependency. Also, prescribed medicines, electroconvulsive therapy (ECT) and psychosurgery are all expensive on some level, especially for patients from low SES communities with low SES. Patients in low SES communities would not be able to afford any of the medication that the medical model suggests for clinically depression patients. According to David Elkins, author of the article *The Medical Model in Psychotherapy: Its Limitations and Failures*, the medical model is inefficient in assessing mental illnesses such as depression as well as. This is indicated when Elkins discusses the many failures of the medical model in the following statement:
This article discusses the limitations and failures of the medical model in psychotherapy. Specifically, the article shows that (a) the medical model does not accurately describe what actually occurs in psychotherapy; (b) the model continues to dominate the field not because of its accuracy but because of its questionable ties with medicine, science, and the health insurance industry; (c) the model obscures the fact that psychotherapy is an interpersonal process, not a medical procedure; and (d) the model fails to account for the fact that the vast majority of clients use psychotherapy for support, guidance, and personal growth instead of treatment for mental illness (Elkins, 2009).

Thus, there are multiple ways in which the medical model is not adequate method for dealing with mental illnesses. Therefore, we can infer that it would also do little to reduce levels of stress-induced depression. The medical model in the psychology suggests that every mental illness, including depression, has a biological source that can be quantified and measured. The model predicts that each mental illness is caused by a chemical imbalance in the brain that is traceable or rather sourced from abnormalities in DNA structure or physical abnormalities in the brain. However, it does not take into consideration the differences between the physical structures of the brain and the mental capacities of the mind. Furthermore, the medical model does not take into account psychological sources of mental illnesses, environmental influences of mental disorders, such as stressors and stressful situations, and it also does not take into consideration cognitive behavior and how the patient’s patterns of thinking affects his/her pattern of patterns of behavior. Although the medical model is helpful in diagnosing a mental illness regarding its ability to be quantifiable, measureable and medically assessable, it misses crucial factors that can be explained by other psychological theories such as cognitive behavior therapy and environmental influences, but more relevant to the current proposal it misses the individual and neighborhood stressors in a community. However, Photovoice addresses both types of stressors in a community.

As a reminder, Photovoice is not proposed to treat depression or to substitute a treatment for depression, rather Photovoice is proposed as a stress-reduction method through its ability to
increase social support from the patient's own community members to tackle neighborhood stressors and through its process of increasing self-awareness by identifying individual stressors. Both social support and self-awareness been shown to reduce stress in previous research. Photovoice is able to avoid the possible side-effects of taking medication through psychotropic medication, can increase the awareness of a lack of depression treatment for patients in low SES communities, can avoid the high economic costs of depression medication, can omit the necessity for geographic advantage in order to gain access to depression treatment since it can be conducted anywhere in the world and, most importantly, it can help to reduce stress during an untreated patient’s time diagnosed with stress-induced depression until depression treatment becomes readily available for patients in low SES communities.

Therefore, we can see why stress-induced depression is important to study, because stress has been shown to contributing factor in the development of depression, which will be explained in further detail soon. In fact, it was also stated by Shaw and Katz that, “the role of stress and adversity has long been considered important in depression” (1971). There is good agreement among researchers that life events, particularly those which carry a high contextual threat or which are associated with “exits,” are more common in subjects with depression prior to the onset of the disorder than in healthy subjects during the same period (Paykel, 1978; Brown & Harris, 1978) (Ingram, 1990). Thus, we can also see how in low SES communities that these stressors are amplified in intensity, duration and frequency meaning that community members experience more intense levels of stress, for a longer period time, and have experience multiple stressful situations, especially PTSD (post-traumatic stress disorder) patients. However, it is suggested that the Photovoice process can identify specific individual and neighborhood stressors that can lead to stress-induced depression, and reduce stress through an increase of self-
awareness and social support that has been shown in prior research. And this is proposed for patients with stress-induced depression. Thus, it must be understood how stress relates to depression.

How Stress Relates to Depression – Stress-Induced Depression

The connection between stress and depression is often viewed as too complex and extremely circular, but the relationship between the two can be illustrated to an extent. People often have negative and unhealthy ways of dealing with stress that they incorporate into their lifestyle and everyday habits, such as smoking, heavy drinking, neglecting exercise, and/or maintaining a poor diet, which can lead to feelings of hopelessness. McEwen illustrates the connection between stress and depression clearly when he states that "stress, or being stressed out, leads to behaviors and patterns that in turn can lead to a chronic stress burden and increase the risk of major depression" (2002). McEwen may have been on to something, because in a recent study that was conducted at Yale University found that chronic stress blocks a gene called neuritin, a small extracellular GPI-anchored protein critical for dendritic outgrowth, maturation, axonal regeneration, in rats, which is a gene that is also present in humans (Son et al., 2012). Thus, stress-induced depression is defined as depression that is a result of stress (Son et al., 2012).

The researchers of the neuritin study investigated how rats would react to chronic stress by subjecting the rats to food and deprivation, isolating them from other rates and switching around their dark and light cycles for three weeks (Hsu, 2012). Afterwards, the researchers found that the rat subjects had little to no interest in food, enjoyed sweetened drinks, and they did not swim when placed in water, which were all identified as signs of “rodent depression”. However, the most significant observation was when scientists observed that while the rats in the stress
group quickly recovered after being treated with antidepressants, rodent depression improved just as well when the rats were injected with a virus that promoted neuritin gene expression and protected the rats from brain cell atrophy and other structural brain changes associated with mood disorders, even when the rats were exposed to stress-inducing environments (Hsu, 2012). The neuritin was able to produce a response that acted similar to an anti-depressant where it could block the effects of stress and depression. In order to confirm the findings of their experiment that neuritin can protect the brain from depression, the researchers blocked the activity of the gene in another group of rats that did were not put in stressful environments and found that the rodents exhibited the same depression symptoms of the rats in the stressed group (Hsu, 2012). The researchers concluded that their results support past findings that implicate stress in the development and advancement of mood disorders. Therefore, the connection between stress and depression is not only a cognitive and behavioral phenomenon, but it has both a biological and neurological basis.

As a result of supported research on the link between stress and depression as stress-induced depression, the current grant proposal poses that the Photovoice process will be able to help reduce stress in young adults who are untreated stress-induced depression patients and who have a lack of access to depression treatment by providing those patients with increases in social support and increases in self-awareness. As a result, the Photovoice process is proposed to be used as a stress-reduction method in stress-induced depression patients who do not have the economic or the geographic means to depression treatment in order that their situation is more bearable in a low SES community. This can be supported by showing that the blood pressure levels, cortisol levels and skin conductive response levels within patients with stress-induced
depression in low SES communities have been significantly reduced after undergoing the Photovoice process.

Chapter 2: Methods of Photovoice Process

Participants

In the current grant proposal, it is proposed that twenty to thirty participants aged 18-25 from the same low SES community will be needed for the experiment in order to take part in the Photovoice process as a community project (10-15 participants for each group). The incentive for the experiment will be an opportunity to reduce stress using a novel method. In addition, a community camera will be donated to the community represented by the participants for community members to conduct Photovoice projects in the future. Ideally, there would be an equal male to female ratio along with, hopefully, some diversity in the demographic of the sample population, but this is unlikely to happen considering the fact that women are twice as more likely to be clinically depressed than men (Guidi, Fava, Bech, Paykel, 2011). Thus, it is expected that there will be more female participants then male participants in the proposed experiment. It is also expected that the participant pool will predominantly be minorities due to the fact that minorities have been reported to have high levels of stress and minorities are more common than whites in low SES communities (McEwen, 2002). In further studies, as it will be mentioned later on in the paper, it would be interesting see if there are trends in one ethnic group that differs from other ethnic groups or if all the ethnic groups share similar trends in terms of stress. As one could imagine, due to the stigma of depression and the fact that many who might be clinically depressed are not diagnosed as such, it might be difficult to identify participants with stress-induced depression. Thus, this might pose as a challenge for the current proposal.
Procedure

The procedure of the proposed experiment will be modeled after the Photovoice Manual, available from the Photovoice Hamilton website, with certain crucial modifications in order to tailor Photovoice for the purpose of reducing stress for the current proposal. The manual outlines nine essential steps to developing Photovoice project in any community. The manual was created by officials of the Community Centre for Media Arts, and the manual steps are based on the

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**Materials & Supplies Needed for the Photovoice Project Process**

1. Disposable or Digital Cameras (are preferred) but regular film loaded cameras are fine*
2. Overhead Projectors
3. Projection Screen
4. Computers
5. Audio and visual recording and amplification
6. Video or Audio tapes
7. Video Camera
8. Tape Recorder
9. Copy Machine
10. Tape
11. Newsprint or Post-It Easel Pad
12. Pens
13. Paper
14. Markers
15. Poster Boards
16. Saliva Sample Kit
17. Blood Pressure Monitors
18. Skin Conductance Meter

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A list of material and supplies that will be necessary in order to conduct the Photovoice process part of the current experiment (Wang, C., & Burris, M. A., 1997).

Note: If conducted in an institution such as a university, in which it is planned to do so in the current proposal, the majority of these materials are already provided.
successful experiences with the Photovoice method. These steps including the following in sequential order as provided by Prairie Women’s Health Centre of Excellence:

1.) Connecting and consulting with the Community, 2.) Planning a Photovoice Project, 3.) Recruiting Photovoice Participants and Target Audience Members, 4.) Beginning the Photovoice Project, 5.) Photovoice Group Meetings, 6.) Data Collection, 7.) Data Analysis, 8.) Preparing and sharing the Photovoice exhibit, 9.) Social action and policy change (as cited in Palibroda, B., Krieg, B., Murdock, L., & Havelock, J., p. 26, 2009).

The current grant proposal for the experiment on Photovoice and stress-induced depression will follow all of these same protocols excluding step 8 and 9 due to the fact that presenting their photographs of stressors to public health officials may skew results through possible high amounts of stress to perform. Table 3 displays all the materials and equipment that will be needed in order to conduct the current experiment on stress-reduction. The most important materials outlined in Table 3 are the saliva sample kit to receive saliva sample in order to measure cortisol, the automatic blood pressure monitors equipment to measure changes in blood pressure after the Photovoice process, and skin conductance monitoring that will be used to measure changes in skin conductance after the Photovoice process.

Prior to the Photovoice protocols 4-7, the participants will need to meet the criteria (Appendix I) for DSM-IV TR (Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition) for major depressive disorder (must have a total of 5 symptoms for at least 2 weeks; one of the symptoms must be depressed mood or loss of interest) and score either moderately higher than average (40-49) or much high than average (50 or above) on the stress symptom scale (Appendix III) in order qualify as an stress-induced patient. All efforts will be made in order for make sure that the participants are representing the same area or community because this creates a sense of unity and commonplace that may provide a stronger sense of social support for the participants in order to reduce stress through community participation. Once these confirmations
are made and the participants are selected then the chosen participants representing the 18-25 demographic, the participants will be informed that they will have the possible benefits of undergoing the Photovoice project process and the risks of taking part in the clinic trials involving observational study after the Photovoice project (Appendix II).

The Photovoice process in the current grant proposal will include a 6 week process, which will include 2 weeks of consulting community, recruiting members and building familiarity among the participants for social support, 2 weeks of Photovoice training for the participants to the Photovoice technique, 2 weeks of data collection using Photovoice for the self-reflection process that includes reflection interviews (Appendix II) and group meetings to conduct data analysis in order to better understand the stressors that they undergo at Bard College. There will be a pre-week prior to the actual 6-week process begins in order to measure stress indicators before the Photovoice process and a post-week to measure stress indicators after the Photovoice process.

The three stress indicators, as mentioned earlier and soon to be explained in detail, are cortisol levels measured in milligrams (mg) using cortisol saliva samples, blood pressure measured in mmHg (millimeter of mercury) using blood pressure monitors, and skin conductance measured in ohms (Ω) using a skin conductance meter. For skin conductance, in order to elicit a stress response traumatic material similar to the PTSD study involving cortisol levels in abused women (Elzinga et al., 2003) will be used. The difference, as mentioned earlier, is that the traumatic material will not be personalized, as it was done in the PTSD, rather the traumatic material will be prepared by the current researcher with the assistance of an interviewer or I will act as the interviewer. The participant’s response will be measured using the skin conductance meter after the participant’s review of the traumatic material and during the
participant description of the traumatic material. In addition, to these three measurements the stress symptom scale will also be used to measure stress after the Photovoice process. As mentioned earlier, the total time to participate in the Photovoice process (2) is estimated to be a 6-week process as described earlier. Also, described earlier in Table 2, Photovoice is time extensive, and it requires commitment from the participants in order to alleviate stress. However, the idea is that Photovoice is worth the time due to its ability to reinforce social support via community participation and due to its ability to increase self-awareness via self-reflection, which may lead to stress-reduction.

Experimental Design

The current proposed experiment will be conducted in a single-blind randomized controlled clinical trial. Around 10-12 participants who meet the criteria for stress-induced depression will be randomly assigned to be a part of the Photovoice process in the experimental group and an identical amount of about 10-12 participants who also meet the criteria for stress-induced depression will be randomly assigned in the control group take part in a 1-day use of the Photovoice technique without any Photovoice training. The cortisol levels, blood pressure levels and skin conductance responses of all participants in both groups will be measured. The experimental design will be modeled after the Mindfulness mediation used for stress-reduction (MBSR) study (see Chapter 1), as mentioned earlier. A single-blind instead of a double-blind is chosen because it will not be possible to conduct double-blind trials for the first attempt of measuring stress-reduction, as a result of Photovoice. As the current researcher, I will be needed for both the experimental and control groups, and I will know who is in which group. If the Photovoice yields results that indicate stress-reduction then a follow-up double blind study can
be conducted unless Photovoice shows no change in stress levels or increase stress. This will pose a necessary limitation for the current experiment that will soon be discussed.

Measures

The World Health Organization has introduced a new concept of measuring suffering of populations based on time lived with disability called Disability-Adjusted Life Year (DALY). According to World Health Report, a large proportion of the burden of disease from neuropsychiatric conditions is attributable to unipolar major depression, which was the fourth leading cause of overall disease burden, while in adults aged 15-44 years, it was the leading cause DALYs lost worldwide (1999). The disease burden resulting from depression is estimated to be increasing both in developing and developed regions. However, establishing a diagnosis of depression versus a normal fluctuation in mood is a crucial issue in estimating the true rate of depression in the community. This is relevant not only for doctors who must distinguish normal variations in mood from depression for the purpose of treatment, but also for health planners and policy-makers for making provisions for mental health care in the community (Regional Office for South-East Asia, 2004).

DALYs are calculated by the following formula:

$$\text{DALY} = \text{YLL} + \text{YLD}$$

where YLL (Years of Life Lost) and YLD (Years Live with Disability). However, the problems with DALYs, in reference to the current grant proposal, are that DALYs are used for entire populations not sample populations. Thus, it cannot be “stressed” enough that depression will not be measured in the current study and that stress-reduction is the sole focus of the study using the Photovoice process.
The Normal Daily Cortisol Range:

The normal range of cortisol throughout the day during these intervals is illustrated with both the top and bottom of the range designated (Brenner, A., n.d.).

Note: Both the top and bottom normal range of cortisol decreases throughout the day (unit of measurement: milligrams).

In order to understand what normal cortisol looks like in terms of stress as a unit of measurement, Figure 10 depicts the normal daily cortisol range. On the y-axis the cortisol as a chemical hormone measured in milligrams (mg) is shown and on the x-axis are time intervals for morning, noon, afternoon and night as they correspond to cortisol levels. Thus, Figure 10 depicts proper diurnal rhythm in a normal day of cortisol production and that the best time to measure cortisol levels is in the afternoon, which will be the designated time when cortisol levels are measured after the Photovoice process. The normal range of cortisol will be used to assess
the levels of cortisol after the Photovoice process, and it will be used to determine whether if the stress levels are normal or abnormally high. In addition to a stress-symptom scale, that will be distributed after the Photovoice process.

Figure 11

Blood Pressure Range for Adults

Blood pressure can be measured by using the top number on the left side of the blood pressure chart for the systolic measure and read across, and the bottom number on the bottom of the blood pressure chart for the diastolic measure. Where the two meet is your blood pressure (Blood Pressure UK, 2008).
Figures 11-13 depict how blood pressure, skin conductance responses and cortisol are measured. In Figure 11, it can be seen that low blood pressure is between 70-90 mmHg (millimeters of mercury) on the systolic (top number) measure of blood pressure on the y-axis and between 40-60 mmHg on the diastolic (bottom number) measure of blood pressure on the x-axis. In contrast, high blood pressure on the systolic measure is between 140-190 mmHg and is 90-100 mmHg on the diastolic measure. Thus, stress-induced patients are expected to have blood pressure on either the pre-high or high blood pressure levels and undergoing the Photovoice process is expected to help reduce levels to the ideal blood pressure level.

**Skin Conductance Response Graph:** The two gray shaded areas contain no intentional events while the person was resting. The EDA is smooth and slowly changing, and can be used to estimate tonic SCL. The tonic SCL in each smooth region can be computed as the average of that region. Here the tonic level is higher after this person exercised (Affectiva, 2013).
In Figure 12, it is skin conductance is illustrated. Skin conductance levels (SCL) are characterized by two phases – tonic and phasic – where tonic SCL indicates the smooth, slowly changing levels of skin conductance indicated with on the graph in Figure 12 reads low tonic SCL and where phasic indicates the rapidly changing peaks that are generally referred to as Skin Conductance Responses (SCRs). In the current proposed experiment, Photovoice participants are expected to experience lower tonic SCL after undergoing the Photovoice process as compared to their initial higher tonic SCL and SCRs to traumatic material, which will be adopted from the PTSD study mentioned earlier, whereby emotional pictures will be presented to the presenters and then their SCL and SCR will be measured.

**Figure 13**

Figure 13 - How Cortisol Will Be Measured Using Saliva Test: The image represents the first of the three measurements that will be used to measure stress. In this picture, saliva tests are depicted, which will be used to measure cortisol levels in saliva swaps (Test Country, 2013).
The last measurement as depicted in Figure 13 shows the saliva test kit used to measure cortisol, which can be measured in mg (milligrams). Salivary cortisol is a good stress index where it has become common knowledge that increased levels of cortisol positively correlate with increased levels of stress. Cortisol levels has been shown to rise slowly over time and takes time to return to base level, which indicates that cortisol is more associated with chronic stress levels (Takai et al., 2004). Thus, it is expected for participants with stress-induced depression to have high levels of cortisol due to chronic stress, but after undergoing the Photovoice process show lowered levels of cortisol due to social support through community participation and self-reflection through self-awareness. These measurements were where chosen due to the fact that high blood pressure has been clearly linked to high levels of stress and that blood pressure, skin conductive levels, cortisol levels and a stress-symptom scale can all be used as stress indicators to identify changes in high levels of stress to lowered levels of stress.

Inside the Photovoice Process

There are many videos that show exactly how Photovoice works. For instance, in the video clip Photovoice, a short film made for the UK charity, Nick Danziger, a patron and photographer further explains how Photovoice works in the following link: http://www.youtube.com/watch?v=Z8fUnzoxAwU (Danziger, 2011). Although there is a systematic way to perform Photovoice and to take part in the process, every Photovoice project is different and has the potential to yield specific health policy changes that make a lasting impact. Photovoice is a communicative tool that requires the use of camera, both film and digital camera, in order to capture certain environments or situations that are sources of stress or concern health problems. Table 5 lists how the Photovoice process is usually conducted, however as mentioned earlier, the process in the current grant proposal will be different from the usual manner in which
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

Photovoice is conducted with steps 8-10 omitted from the experiment due to the fact that a presentation of Photovoice findings to a board of strangers can be stressful in itself, and it can skew the results of the proposed experiment. As it is outlined in Table 4, it should be noted that steps 2 and 7 are the most crucial elements of the process elicit stress-reduction as seen in previous research on social support and self-awareness.

<table>
<thead>
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<th>Table 4</th>
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**Photovoice Process**

1. Identification of Community Issue – Week 1
2. Participant Recruitment – Week 2 (Social Support via Community Participation)
3. Photovoice Training – Week 3 & 4
4. Camera Distribution and Instructions – Week 4
5. Identification of Photo Assignments – Week 4
6. Photo Assignment Discussion – Week 5
7. Data Analysis – Week 6 (Self-Awareness via Self-Reflection)
8. Identification of Influential Advocates – Omitted
9. Presentation of Photovoice Findings – Omitted
10. Creation of Plans for Action for Change – Omitted

Illustrates step by step how the Photovoice process is conducted. This is a general overview of the list of things to do during the process without a time line. This is a typical outline for most, if not all, Photovoice projects Wang, C., & Burris, M. A. (1997).

Note: In the current proposal, only steps 1-7 will need to be conducted for stress measurement, as 7-9 are for public health officials and will be omitted in the current proposal. Also, note that steps 2 and 7 are the most crucial elements of the process elicit stress reduction as seen in previous research on social support and self-awareness.
Chapter 3: Predicted Results of Photovoice Process on Stress Levels

Hypothesis

The hypothesis of the current proposal is that the experiment group who undergoes the six week Photovoice process will show significant signs of stress-reduction with decreased blood pressure, skin conductance (when exposed to traumatic material) and cortisol levels. This is expected to occur when the experimental group is compared to the control group who only uses the Photovoice technique for a day without further encouragement to use it. The predictions of these results are based on the findings that an increase of social support and self-awareness, which Photovoice provides through community participation and self-reflection, that has been shown to reduce stress (see Chapter 1).

Table 6 depicts dysfunction in the HPA axis that is observed in some depressed patients. When the HPA axis was examined there was elevated cortisol production, elevated corticotrophin releasing factor (CRF) production, down-regulated CRF receptors in

<table>
<thead>
<tr>
<th>HPA Axis Component</th>
<th>Observation in Depressed Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortisol production</td>
<td>Elevated</td>
</tr>
<tr>
<td>CRF production</td>
<td>Elevated</td>
</tr>
<tr>
<td>CRF receptors in paraventricular nuclei</td>
<td>Downregulated (perhaps due to excess CRF signals)</td>
</tr>
<tr>
<td>Hippocampus</td>
<td>Atrophied</td>
</tr>
</tbody>
</table>

This table lists previous research that can support the predicted results of the current experiment. This table specifically supports the link between stress and depression where cortisol production is shown to have elevated levels in depressed patients (Stahl, S. M., & Wise, D. D., 2013).
paraventricular nuclei, and the hippocampus, there was degeneration of the hippocampus, which may have affected hippocampal size (Stahl, S. M., & Wise, D. D., 2013). Thus, as it can be seen in Table 6, high cortisol levels are observed in some depressed patients, who can be acknowledged as stress-induced depression patients (Son et al., 2012). In fact, there are certain demographic groups that are more likely to be associated with depression regarding, as mentioned earlier, certain social and cultural factors that increase level of depression. One of these is social class.

In Figure 14, a general layout of the predicted results is shown where a general relationship between the variables is given rather than predicted statistical results because of the measurements used in the current experiment. Due to stress measurements, which in the current grant proposal are blood pressure, skin conductance, and cortisol salivation samples, the predicted results are that high levels of each measurement, as a consequence of stress-induced depression, will lead to a return to normal levels of each measurement, as a consequence of participating in the Photovoice process, thereby reducing stress through social support and self-reflection. Thus, levels of cortisol, blood pressure and skin conductance, as depicted in each graph in Figure 14, are expected to be high prior to the Photovoice process, in fact, each measurement is required to be high in participants who want to be a part of the study except high blood pressure because hypertension is a chronic medical condition. In terms of the stress symptoms scale, the stress scale scores are expected to decline in high estimated amounts of stress on the scale to lower estimations due to the self-reflection benefits that are possible with Photovoice. And lastly, participants are expected to increase their perceived social support from low social support ratings to higher social support ratings due to the community participation that Photovoice can provide for participants.
Predicted Results

![Figure 14](image)

**Levels of Cortisol**
(Post-Intervention)

**Blood Pressure Levels**
(Post-Intervention)

- Cortisol Levels (mg)
- Blood Pressure Levels (mmHg)
Skin Conductance Responses to Traumatic Material

- **SCL (Ohms)**
- **Stress Scale (1-60)**

Perceived Social Support

- **Social Support (self-report scale 1-132)**
- **Self-Awareness (5-point Likert scale 1-33)**

Scale Symptom Scale

- **Baseline**
- **Post-Test**

Emotional Self-Awareness Scale (EASS)

- **Baseline**
- **Post-Test**
Statistical Analysis

Statistical analyses will be conducted on the participants in both the control group and the experiment group. The control group is defined by those who have tried the Photovoice technique at least once after a quick seminar on how to take pictures and then add text to those pictures for them to keep. The data of the predicted results will be analyzed using mixed effect linear models that treat study condition and time (baseline vs. post-intervention) as fixed effects, as conducted in the MBSR study (Heinrichs et al., 2003). In a mixed model, the statistical model will contain both fixed effects (observed quantities that are treated as if the quantities were non-random) and random effects (assumes that the dataset being analyzed consists of a hierarchy of different population whose differences relate to that hierarchy) (Heinrichs et al., 2003). A mixed model will be used because of the fact that it is useful in settings where repeated measurements are made on the same statistical units. This method is preferred over other repeated measures, such as ANOVA (analysis of variance).

Framework for Results

In order to justify the methods for measuring stress and to provide a framework for the predicted results, there is an experiment that can be used to support the methods of the current grant proposal on how to measure stress. In addition, it involved emotional pictures, which is essentially what Photovoice comprises emotional picture of stress-related or non-stressful related events within a communities, and cortisol levels in patients with an anxiety disorder similar to stress-induced depression. This article is titled, Higher Cortisol Levels Following Exposure to Traumatic Reminders in Abuse-Related PTSD, where cortisol levels were measured following trauma imagery (emotional pictures) in PTSD (post-traumatic stress disorder) (B.M. Elzinga et. al, 2003).
The purpose of the cortisol and PTSD experiment was to measure the differences of cortisol levels that were induced through repeated exposure to personalized trauma scripts with women who have PTSD currently versus women who have a record of abuse, but have not been diagnosed with PTSD. The experimental hypothesis predicted that higher cortisol levels would be more prevalent in PTSD patients when they were exposed to the personalized trauma scripts (emotional content, i.e. emotional pictures) in comparison to the control group. The importance of the research was to collect more information on the relationship between cortisol levels during a number of processes such as encoding, memory functioning and performance, recalling information and the neutral and emotional memory types. This was done by presenting the participants with neutral and emotional words and paragraphs directly after the exposure to the trauma scripts in order to assess all of the functions that were named above after a number of days, i.e. 3 days (to assess the decline in memory or lack of memory storage).

The procedure of the cortisol level and PTSD experiment was very straightforward and involved salivary cortisol levels that were measured after exposure to personalized trauma scripts in abused women with PTSD and abused women without PTSD (both have N=12). Afterwards, immediately after and then again following a time frame of three days, the participants memory capabilities for both neutral and emotional material was assessed immediately after trauma scripts were exposure to them. This was done in order to further investigate the relationship between cortisol levels, how they impact different types of memory capacities and different types of memory, such as neutral and emotional memory.

The researchers found in their results that the abused women with PTSD had much higher cortisol levels found in their saliva than the abused women without PTSD, and these cortisol level were calculated by the researchers to the measurements were elevated by an average of
122% in the experiment group versus the control group during the script exposure (main effect for diagnosis: F[1,22] = 4.08, P < 0.056, Figure 1) (B.M. Elzinga et. al, 2003). In addition, they found that experimental group who were abused women with PTSD exhibited higher cortisol levels compared to controls during and almost immediately after the script exposure when comparing separate time points (i.e. significant main effect for time: F[13,299] = 6.00, P < 0.001) (B.M. Elzinga et. al, 2003). However, when comparing the effects of depression on cortisol levels, there were no detected differences among PTSD patients with depression (n = 3) and non-PTSD patients (n = 9) without depression. Thus, considering the experiment’s results and their research in stress and depression involving emotional pictures that are indirectly identical to Photovoice, this experiment can be used as a framework for the current grant proposal.

However, there are some critiques of the experiment that include the fact that their sample size was relatively small reducing the power of the experiment. However the researchers do acknowledge this limitation. Nonetheless, the researchers were able to make an equal divide between the participants in the experimental group and the control group (both have N =12), which is a positive critique of the experiment. Another critique includes that about a third of the participants were under medication, identified by the researchers as psychotropic medication, which were not distributed by the researchers. Thus, this could have affected their results with no detected difference in depression with stress among the groups due to anti-depressive effects. However, the researchers do acknowledge this fact, and they suggest that further studies should investigate the effect of cortisol reactivity in non-medicated versus medicated PTSD patients to determine the effects of medication on cortisol levels and cortisol activity.

The researchers conclude that their findings may imply that cortisol levels are increased with exposure to stress at suppressed baseline activation. This is consistent with prior studies and
the findings of previous experiments. In addition, they found it shocking that the correlation between cortisol and Clinician-administered PTSD scale (CAPS) dropped to insignificant levels after exposure to personalized traumatic scripts, which they stated that this indicates that PTSD symptoms are not a good predictor of cortisol levels under resting conditions. This suggests that the correlation PTSD may only be a reliable predictor only under stressful conditions. The only significant correlation that the researchers found was a positive correlation between cortisol levels, and the recall of an emotional story indicating that emotional arousal may enhance memory functioning, as a result of cortisol activity. Thus, through the PTSD study involving cortisol levels a framework for the predicted results has been provided. Now, we can see that the chosen methods of measuring stress through indicators such as blood pressure, skin conductance, and saliva samples are good choices.

Chapter 4: Discussion and Future Steps

Importance of the Photovoice Process for Stress-Reduction

The Photovoice process, as a proposed method for stress-reduction, is important for reasons clearly established in the Introduction and Chapter 1 of the current proposal. The main reason, regarding low SES community members, is that untreated patients with stress-induced depression lack treatment and access to depression because of economic and geographic barriers described in the beginning of the current proposal. Depression medication is expensive and is exclusive to middle and upper class communities. Some low SES community does not even have a community pharmacy or produce generic medications to make up for clinically tested medication. In addition, most low SES communities do not have psychiatric or clinical institutions that provide therapy, deep brain stimulation, and electroconvulsive therapy. The closest psychiatric or clinical facility might be miles away, and a lack of transportation to these
places poses another problem. Photovoice presents an advantage in that it can be conducted within the community and there is no need to travel outside of the community thereby eliminating transportation costs. This is mainly how the Photovoice process as a stress-reduction method is importance for untreated patients with stress-induced depression in low SES communities.

Furthermore, the current proposal is important in terms of the increasing vulnerability to depression worldwide that, as mentioned in Chapter 1 of the current proposal has been predicted to be one of the leading causes of debilitation. There is an element of urgency to increasing the availability of depression medication for low SES community members give an epidemic occurs and the earlier this predicament is addressed the better. Thus, this is a crucial time to conduct on stress-reduction using the Photovoice process and to help to increase the availability of depression treatment for low SES community members. The sooner that studies such as the current proposed experiment are conducted in order to investigate how to help disadvantages patients the better because, as of now, not much is being done about the lack of depression treatment as described earlier in the Introduction of the current proposal.

Lastly, the current proposal holds importance to stress maintenance. Also depicted earlier in Chapter 1 of the current proposal, are the negative effects that chronic stress can have on the mind and body, which can lead to both physical diseases and mental disorders, such as cardiovascular disease, heart disease, panic disorder and depression. Therefore, the current grant proposal addresses the issue of a lack of depression treatment availability for stress-induced patients in low SES community who are under high amounts of stress and the proposed solution is Photovoice, as a stress-reduction method, that may reduce stress (not a solution for depression).
Implications of Predicted Results

Regarding the potential implications of the current grant proposal and its findings, if it found that undergoing the Photovoice process reduces stress indicators of blood pressure, cortisol levels, and skin conductance then it would provide further evidence that increases in social support and self-awareness can reduce stress. In other words, using photography to capture both individual and community stressors and then recruiting community members to come together to provide social support from each other while each individual reflects on their stress experience by using their voice through transcribed text in order to improve their understanding of stress through self-awareness would be shown to be useful in stress-reduction for untreated patients with stress-induced depression. In this manner, the uses of social support and self-awareness for stress-reduction would be further supported through the use of the Photovoice process for reducing stress.

Conventional vs. Unconventional Participation

Furthermore, results could also imply that conventional community participation such as Photovoice is more useful than unconventional community participation that is used for social support. In other words, stress-reduction is more likely to occur with conventional community participation rather than unconventional community participation. The potential implication of the positive effects that community participation can have in communities to promote social support is shown in the following statement:

Community participation in health is indisputably a noble goal, worthy of the concerted attention it has received in international health circles. Equally indisputable, however, is the fact that community participation is a powerful concept with revolutionary potential. Governments that promote participation assume the obligation to listen and respond to their citizenry, to accept criticism, to negotiate, and to work toward substantive sociopolitical change. In Costa Rica, a sustained effort to increase participation in health would have necessitated a redistribution of decision-making power as politicians,
bureaucrats, and local elites shared control with other constituencies (Morgan, L., 1993, p.159).

Thus, community participation is looked upon as a good goal for providing social support for fellow neighborhoods with similar problems. In other words, it is an acceptable even encourages method for increasing social support among community members. However, unconventional community participation is not as acceptable to providing social support to community members. In the book *Community Participation in Health: the Politics of Primary Care in Costa Rica* written by Lynn Morgan, Morgan reveals thoroughly describes the differences between conventional and unconventional participation in political reform in the following statement:

The differences between the kind of participation envisioned in the United Nations report and these other forms of participation have been distinguished into “conventional” and unconventional” forms of political participation (Seligson and Booth 1976: 101) (Morgan, L., 1993, p.42). In essence, participation condoned by the state is conventional, whereas participation opposed by the state (for example, “strikes, protests, riots, and rural and urban land invasions”) is unconventional. In fact, the very existence of a distinction between “conventional” and “unconventional” forms of participation both derives from and demonstrate the state’s hegemony over the concept of participation: if the state did not define some forms of participation as “legitimate,” political scientists would not need to form a separate analytic category for “unconventional” forms of participation. The underlying premise of the United Nations community development was that unconventional forms of participation were undemocratic, and that social activism outside the electoral framework was an unacceptable means of working toward community development (Morgan, L., 1993, p. 41-43).

Thus, we can see that unconventional forms of community participation might end up causing more tension and is not recognized as a good method of increasing social support for community members. Similar to presenting Photovoice to board of public officials, unconventional community participation is more likely to increase stress rather than reduce stress. Thus, the likelihood that community participation is another good source of social support when dealing with stress reduction, especially under stressful circumstances such as living in a
low SES community, is much higher than the likelihood that unconventional community participation is another good source of social support.

*If Hypothesis is not supported*

If stress-induced patients under the Photovoice process and experience no change in stress measurements then it would imply that stress-induced is more difficult and complex than expected. In this manner, the Photovoice process simply would not be enough to help reduce stress where no changes will be indicate or even increases in stress could arise. However, these results are unlikely due to the fact that an increase of social support and self-awareness, which are both provided through Photovoice, have been shown to yield significant reductions in stress measurements. Even if the experiment fails and stress is not reduced in patients with stress-induced patients, the least that would be done is an increase of awareness of a lack of depression treatment for patients in low SES communities with limited resources in a follow-up to the results of the current proposal. Thus, the null hypothesis would depict no significant changes in stress measurements. Since the presentation process of Photovoice to public health officials is omitted from the current proposal and due to the fact that Photovoice uses conventional community participation and not unconventional community participation, an increase of stress levels is not expected to occur unless an outlier or undetected confounding variable skews the results. Any outliers will be omitted from the proposed experiment.

*Limitations of the Study*

Some of the limitations of the current study have already been mentioned in Table 2 where the pros and cons of Photovoice are listed, particularly the fact that Photovoice is time extensive and requires commitment from the participations. However, it is possible Photovoice
as a proposed, lost cost-effective stress-reduction method might appeal to participants with lack of resources and limited access to depression treatment.

The generalization of results to other populations may be limited due to the fact that it will be conducted in one community in the United States. It is possible that even if the Photovoice process is found to reduce stress that process might only be applicable to low SES community members who would rather try something new rather than nothing at all. Even though the stressors in a middle or high SES community are not as intense or as frequent as in a low SES community, Photovoice process can still be conducted in middle and high SES communities, if participants are willing. Photovoice might be perceived as unnecessary since most people in these communities can afford treatment for depression. However, providing social support through community participation and self-awareness through self-reflection by taking picture and transcribing text to those pictures can be done anywhere.

In a single blind experiment, the researcher’s inclination towards his or her predicted results can deviate from the actual results indicating experimenter’s bias. Thus, there is a significant limitation in the experimental design of the current proposal where a single-blind experiment is only possible and a double-blind experiment is not yet possible in the current proposal. The logic behind this is that, as the current researcher of the proposed experiment, I will be needed during both the experimental group undergoing the Photovoice process and the control group using the Photovoice technique. Associates for the current proposed experiment will be needed who most likely would be nurse personnel who are familiar will measuring stress levels, such as cortisol levels, skin conductance and blood pressure levels, and who have conducted at least one of these measures. Only after learning to properly measure stress can double-blind trials be conducted. In this case, in a follow-up study to the current proposal, two
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

Photovoice veterans can be recruited. One would lead the control group and the other the experimental group after Photovoice is shown to reduce stress in a single-blind study. In this manner, any unrecognized biases, such as experimenter’s bias, can be avoided and a higher standard of scientific rigor can be achieved.

Since Photovoice has been conducted around the world, as it was illustrated in Chapter 1 of the current proposal, the results may not be very difficult to replicate because Photovoice is designed to be replicated, especially in low SES communities. However, future studies should still be conducted on a larger scale from multiple low SES communities in America to different countries around the globe. A sample size is another limitation the study particularly to the external validity of the current study. Thus, more participants who meet the criteria for clinical depression and meet the criteria for high stress on the stress symptom stress can be recruited for a larger sample size in further studies. In addition, participants may have more than one form of depression and those other forms of depression, such as dysthymic disorder, bipolar disorder, may influence and/or skew the results. Thus, it is absolutely crucial to exclude participants with other forms of depression and to focus solely on participants who meet the criteria for stress-induced depression.

Future Steps

There are many directions that can be taken if the Photovoice process is shown to reduce stress in stress-induced patients. If Photovoice is shown to reduce stress in patients with stress-induced depression then the Photovoice process can be replicated on a larger scale with more participants than the proposed experiment, and it can be conducted in various low SES communities. In addition, if Photovoice has been shown to be an effective process for significant stress-reduction in cortisol levels, blood pressure and skin conductance for untreated patients
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

with stress-induced depression in low SES communities then the Photovoice process, as a stress-reduction method, can be conducted in middle or even high SES communities. Another suggested direction would be investigate if the Photovoice process reduces stress that is experienced with other mental illnesses or anxiety disorders such as obsessive compulsive disorder, PTSD (post traumatic stress disorder, and panic disorder.
Conclusion

We live in a very stressful world that continues to get more stressful. Previous data has indicated that people are becoming more depressed, as a result of the overwhelming amount of stress we have to deal with every day. And some have it worse than others. Some experience a greater amount of stress, but cannot do anything about it because of the economic and geographic barriers to the solutions to their problems. Yet, there is little to nothing being done about it. The reason why little to nothing is done about this predicament is because these communities are frequently overlooked. This is why I propose a novel method where a participant can gaze through the lenses of a camera to “look stress in the eye” and begin a new vision for him or herself without the need of any outside help. But this method would not be limited to just the individual rather it would be expanded to an entire community where the community members support each other to meet a common goal by promoting what one could call “inside help.” And when help from the outside is willing to open their ears and listen this method would allow their voices to be heard.
“The voice of the intellect is a soft one, but it does not rest until it has gained a hearing.”

~Sigmund Freud
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Appendix

Appendix I: DSM-IV TR Criteria for Major Depressive Episode

Appendix II: Participant Consent Forms (for Participation Photovoice Technique or Process)

Appendix III: Scales (Multi-dimensional Scale Perceived Social Support, Emotional Self-Awareness Scale (ESAS), Stress Symptom Scale)
STRESS REDUCTION THROUGH THE PHOTOVOICE PROCESS

Appendix I

DSM-IV TR Criteria for Major Depressive Episode

Must have a total of 5 symptoms for at least 2 weeks

(One of the symptoms must be depressed mood or loss of interest)

1. Depressed mood.
2. Markedly diminished interest or pleasure in all or almost all activities.
3. Significant (>5% body weight) weight loss or gain, or increase or decrease in appetite.
4. Insomnia or hypersomnia.
5. Psychomotor agitation or retardation.
6. Fatigue or loss of energy.
7. Feelings of worthlessness or inappropriate guilt.
8. Diminished concentration or indecisiveness.
9. Recurrent thoughts of death or suicide.

Over the past month have you been bothered by:

1. Little interest or pleasure in doing things?
2. Feeling down, depressed or hopeless?

Suspect Major Depression:
A. Presentations (in addition to obvious sadness)
   - Multiple somatic complaints and visits
     (i.e. > 5 visits; more than 1 organ system with the absence of physical findings);
     weight gain/loss, cognitive deficits
     (impaired attention, concentration and ST memory)
   - Fatigue/sleep disturbances
B. Risk Factors
   - History of major depression and/or substance abuse
   - Dysthymia
   - Changes in work and/or interpersonal relationships

Diagnose and characterize major depression with clinical interview to include:

A. DSM-IV TR criteria.
B. History of present illness. (Onset and severity of symptoms, functional impairment, past episodes and psychosocial stressors.) Assess prior effective, failed treatments.
C. Pertinent medical history, especially illness that can cause depression.
D. Assess for current substance abuse, withdrawal or medications that can cause depression.
E. Psychiatric co-morbidity.

(Nydegger, 2008)
Photo Consent Form 1

We are taking photographs of stressors in our lives and talking about them with other people in our group.

Please sign this form if you agree to let me take your photograph for this project.

If you would like a copy of this photo, please write down your address.

I agree to have my photo taken for this Photovoice project:

__________________________________
Name

__________________________________
Signature

__________________________________
Date

__________________________________
Name of photographer
Photo Consent Form 2

With this form I give — or refuse — permission for take photos for data collection involving individual and community stressors.

☐ Yes, I am willing to have my photographs shared with community members

☐ No, I do not want to share my photographs with community members

I also need to give — or refuse — permission for my name to be listed as the photographer.

☐ I want my FULL NAME listed as the photographer.

☐ I want only my FIRST NAME listed as the photographer.

☐ I DO NOT want my name listed at all.

Please list any concerns or comments:

__________________________________________

Name

__________________________________________

Signature

__________________________________________

Date
Directions for Photovoice Reflection Interviews
(Hamilton, 2012)

1. Go over the photos and fill out the consent form with each participant, be clear about the fact the pictures that they do not want used by the TAC are clearly marked on the form.

2. Have each participant take out their personal photos before discussing their Photovoice photos.

3. The discussion will be facilitated using the Photovoice Discussion Form and the following questions. These questions were adapted from Caroline Wang’s SHOWED Form.

1.) What do you see here?

2.) What is really happening here?

2.) How does this relate to our lives?

3.) Why does this problem, condition, or strength exist? Why stressor cause stress for you?

4.) What can we do to educate others about this problem, condition, or strength?

5.) What can we do about it?

6.) Please select your favorite or most significant photo to share with the group.

7.) What have you learned about yourself?
Appendix III

Scales

Multidimensional Scale of Perceived Social Support
(Zimet, Dahlem, Zimet & Farley, 1988)

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the “1” if you Very Strongly Disagree
Circle the “2” if you Strongly Disagree
Circle the “3” if you Mildly Disagree
Circle the “4” if you are Neutral
Circle the “5” if you Mildly Agree
Circle the “6” if you Strongly Agree
Circle the “7” if you Very Strongly Agree

1. There is a special person who is around when I am in need.

2. There is a special person with whom I can share my joys and sorrows.

3. My family really tries to help me.

4. I get the emotional help
and support I need from my family.

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<tr>
<td>5. I have a special person who is a real source of comfort to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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My friends really try to help me.

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<tr>
<td>6. My friends really try to help me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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I can count on my friends when things go wrong.

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<tr>
<td>7. I can count on my friends when things go wrong.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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I can talk about my problems with my family.

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<tr>
<td>8. I can talk about my problems with my family.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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I have friends with whom I can share my joys and sorrows.

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<tr>
<td>9. I have friends with whom I can share my joys and sorrows.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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There is a special person in my life that

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<tr>
<td>10. There is a special person in my life that</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>SO</td>
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</tbody>
</table>
care about my feelings.

11. My family is willing to help me make decisions.

12. I can talk about my problems with my friends.
Emotional Self-Awareness Scale (ESAS)  
(Elkin, 1999)

All items are on a 5-point likert scale ranging from zero to five  
(0 = Never, 1 = Very Little, 2 = Sometimes, 3 = Often, 4 = A  
lot). Subscales range from 0 to 20. Total scale ranges from 0 –  
132.

<table>
<thead>
<tr>
<th>Item</th>
<th>Question</th>
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<tbody>
<tr>
<td>1</td>
<td>My moods are hard to describe (reverse)</td>
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<tr>
<td>2</td>
<td>I examined my feelings and then decided what to do</td>
</tr>
<tr>
<td>3</td>
<td>It’s important to me to understand what my feelings mean</td>
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<td>4</td>
<td>It's hard for me to tell what mood I’m in (reverse)</td>
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<td>5</td>
<td>I analyze my personality to try to understand why I’m upset</td>
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<tr>
<td>6</td>
<td>Expressing emotion is easy</td>
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<td>7</td>
<td>I usually know why I feel the way I do</td>
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<tr>
<td>8</td>
<td>I often have trouble deciding what will improve my mood (reverse)</td>
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<tr>
<td>9</td>
<td>I know how I feel about most things</td>
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<td>10</td>
<td>I don't know why I feel the way I feel (reverse)</td>
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<tr>
<td>11</td>
<td>I go away by myself and think about why I feel a certain way</td>
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<td>12</td>
<td>I like to write down what I’m feeling and analyze it</td>
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<td>13</td>
<td>I can talk about mood to others</td>
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<td>14</td>
<td>I don’t really think about why I behave as I do (reverse)</td>
</tr>
<tr>
<td>15</td>
<td>I often 'self-talk' to think about feelings</td>
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<td>16</td>
<td>I’m often confused about how I feel about things (reverse)</td>
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<tr>
<td>17</td>
<td>I’m often aware of being emotional, but I can’t describe the emotion</td>
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<tr>
<td>18</td>
<td>I frequently take time to reflect on how I feel</td>
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<tr>
<td>19</td>
<td>I often know what caused my mood</td>
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<tr>
<td>20</td>
<td>I’m usually aware of my emotions</td>
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<tr>
<td>21</td>
<td>I like to go someplace alone to think about my feelings</td>
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<tr>
<td>22</td>
<td>I don’t often think about my feelings (reverse)</td>
</tr>
<tr>
<td>23</td>
<td>I often think about ways to make myself feel better</td>
</tr>
<tr>
<td>24</td>
<td>I know exactly how I’m feeling</td>
</tr>
<tr>
<td>25</td>
<td>Sometimes I can’t figure out how to make myself feel better (reverse)</td>
</tr>
<tr>
<td>26</td>
<td>When feeling bad, I try to deal with my problems and concerns</td>
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<tr>
<td>27</td>
<td>I can verbalize my feelings</td>
</tr>
<tr>
<td>28</td>
<td>I usually have clear idea about how my feelings affects my behavior</td>
</tr>
<tr>
<td>29</td>
<td>It’s difficult to make sense of the way I feel about things (reverse)</td>
</tr>
<tr>
<td>30</td>
<td>I find it easy to write down how I feel</td>
</tr>
<tr>
<td>31</td>
<td>It's difficult to communicate what I feel (reverse)</td>
</tr>
<tr>
<td>32</td>
<td>I often think about the way I feel about things</td>
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<tr>
<td>33</td>
<td>I analyze recent events to try to understand why I’m upset</td>
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Note: Reverse scored items are indicted by (reverse)
The Stress-Symptom Scale
(Elkin, 1999)

Rate the frequency with which you’ve experienced each of the items listed below. Take the last two weeks as your time frame. Use this helpful rating scale:

0=Never
1=Sometimes
2=Often
3=Very often

Fatigue or tiredness _____
Pounding heart _____
Rapid pulse _____
Increased perspiration _____
Rapid breathing _____
Aching neck or shoulders _____
Low back pain _____
Gritting teeth or clenching jaw _____
Hives or skin rash _____
Headaches _____
Cold hands or feet _____
Tightness in chest _____
Nausea _____
Diarrhea or constipation _____
Forgetfulness _____
Nail biting _____
Twitches or tics _____
Difficulty swallowing or dry mouth _____
Colds or flu _____
Lack of energy _____
Overeating _____
Feeling helpless or hopeless ____  
Excessive drinking ____  
Excessive smoking ____  
Excessive spending ____  
Excessive drug or medication use ____  
Feeling upset ____  
Feeling nervous or anxious ____  
Increased irritability ____  
Worrisome thoughts ____  
Impatience ____  
Feelings of depression ____  
Loss of sexual interest ____  
Feeling angry ____  
Sleep difficulties ____  
Forgetfulness ____  
Racing or intrusive thoughts ____  
Feeling Restless ____  
Difficulty concentrating ____  
Periods of crying ____  
Frequent absences from work ____  

**Your total Stress-Symptom Score ____**

<table>
<thead>
<tr>
<th>Stress Rating</th>
<th>Your Score</th>
<th>Your Comparative Rating</th>
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<tbody>
<tr>
<td></td>
<td>0-19</td>
<td>Lower than average</td>
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<tr>
<td></td>
<td>20-39</td>
<td>Average</td>
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<tr>
<td></td>
<td>40-49</td>
<td>Moderately higher than average</td>
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<td></td>
<td>50 and above</td>
<td>Much higher than average</td>
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