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Cognitive Behavioral Group Therapy for Blind and Visually Impaired Adults: Acceptance, Problem-solving, and Cognitive Distortions

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Philadelphia College of Osteopathic Medicine

School of Professional and Applied Psychology

COGNITIVE BEHAVIORAL GROUP THERAPY FOR BLIND AND VISUALLY IMPAIRED ADULTS: ACCEPTANCE, PROBLEM-SOLVING, AND COGNITIVE DISTORTIONS

By Collin D. Mullins

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DISSERTATION APPROVAL

This is to certify that the thesis presented to us by Collin Mullens

on the 13th day of May, 2019, in partial fulfillment of the

requirements for the degree of Doctor of Psychology, has been examined and is

acceptable in both scholarship and literary quality.

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Abstract

This study sought to explore the efficacy of group Problem-Solving Therapy (PST) adapted for individuals living with visual impairment. Specifically, this study investigated changes in quality of life, levels of acceptance, problem-solving, depression, and cognitive distortions following treatment. A group of ten participants (N = 10) were recruited in a large Northeastern city from a non-profit organization providing programming to individuals with visual impairment. Combined pretest-posttest experimental and qualitative study designs were utilized. Individuals were assessed using measures to acquire baseline and outcomes on depression (Beck Depression Inventory-II), acceptance (Acceptance and Action Questionnaire-II), quality of life (World Health Organization Quality of Life-Brief), problem-solving (Vision Specific Optimization in Primary and Secondary Control), and cognitive distortions (Inventory of Cognitive Distortions). Eight of the original ten participants completed posttest measures immediately following the PST group treatment and six of the original ten were assessed at three-month follow-up. Of the eight participants whose posttest data were available, five participants reported decreases in depression scores, two reported increases in acceptance, and seven reported decreased levels of cognitive distortions. Results on quality of life and problem-solving were mixed. Qualitative data were also explored and relevant themes were identified and discussed. This study identified a number of obstacles to efficacious, evidence-based treatment for the sight-impaired community and offers practical suggestions on how to overcome these impediments to effective treatment.

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Chapter 1: Introduction

Statement of the Problem

The definition of visual impairment has remained relatively unchanged since 1972 (World Health Organization, 2004). Traditional definitions of visual impairment are rooted primarily in measures of visual acuity and are determined by an individual's ability to identify alphanumeric shapes at a distance of twenty feet. Visual impairment is also determined by the range, measured by degrees, of the visual field (Thylefors, Negrel, Pararajasegaram, & Dadzie,1995). For purposes of this paper, the term visual impairment will be defined by the International Classification of Disease, 10th Edition definition and will include those with moderate visual impairment (<6/18 to 6/60) and those with severe visual impairment (<6/60 to 3/60) (World Health Organization, 1992).

By this definition, the number of individuals living with visual impairment around the world is staggering; studies conducted in thirty-nine countries put global estimates of visual impairment at 285 million people (Pascolini & Mariotti, 2012). In the United States, an estimated 3.4 million individuals over the age of forty live with visual impairment, which also includes those meeting criteria for blindness (Eye Disease Prevalence Research Group, 2004). According to estimates based on an aging population and increases in obesity, and the corresponding rising number of individuals with related vision-impairing illnesses, such as diabetes, there will likely be an increasing number of individuals seeking treatment for visual impairment and blindness in the coming decades.

Visual impairment specific to the United States has a number of precipitating factors which include age-related degeneration of cells, underlying medical conditions, or malformed eye anatomy (Eye Disease Prevalence Research Group, 2004). Misshapen lenses are one of the most common forms of visual impairment and are known as refractive errors. Refractive errors are responsible for the development of myopia (near-sightedness), and hyperopia (farsightedness) and can generally be corrected by spectacles, contact lenses, or surgery (Congdon, Friedman, & Lietman, 2003). Other contributing factors related to either deterioration of cells or underlying disease are cataracts, glaucoma, age related macular degeneration, and diabetic retinopathy (Congdon, Friedman, & Leitman, 2003).

Projected estimates of visual impairment in the future is a primary public health concern. As individuals continue to age due to advances in clinical care, the prevalence of visual impairment is predicted to increase (Saadine et al., 2008).

Visual impairment, regardless of the underlying cause, has long been identified as significant contributors of disability, limiting an individual’s ability to complete important daily life tasks (Laforge, Spector, & Sternberg, 1992). Those living with visual impairments often endure difficulties obtaining employment (Wolffe, Roessler, & Shriner, 1992), independent accomplishment of activities of daily living such as personal hygiene and dressing (Horowitz, 2004), traveling with autonomy (Long, Boyette, & Griffin-Shirley, 1996), completing complex tasks of home management (paying bills, cooking, etc.) (West et al., 1997), and decreased desirable social interactions (Wang, Mitchell, Smith, Cumming, & Attebo, 1999).

There are innumerable ways in which life changes for individuals who become visually impaired. Uneven sidewalks become hazards, receiving change from a clerk at a store becomes an opportunity to be exploited, asking for directions opens the possibility for embarrassment, and even navigating one’s own home can become the source of immense frustration. Individuals are forced to adapt to a life with impaired vision and evidence suggests that adaptation can be an enormous challenge.

The onset of visual impairment can be a profound and negative event in an individual's life with far reaching behavioral and emotional sequelae. Functional limitations of those with visual impairment can often be a catalyst for the development of emotional distress. Individuals living with blindness or visual impairment suffer from depression at a higher rate than that of their non-visually impaired counterparts (Casten & Rovner, 2008) and studies have linked the onset of depression to decreases in autonomy and physical activity (Hayman, et al., 2007; Evans, Fletcher, & Wormald, 2007). These findings linking decreased independence and limited physical activity due to vision loss and depression are affirmed in many studies (Mathew et al., 2011; Renaud & Bedard, 2013).

Broadly, difficulties in adjustment to the onset of vision loss also predict the development of depression (Schilling, Wahl, Horowitz, Reinhardt, & Boerner, 2011); those who have difficulties in accepting impaired vision are at higher risk of developing profound feelings of sadness.

Unsurprisingly, given the emotional distress and functional limitations, individuals with visual impairments report a lower health-based quality of life when compared to their same aged peers (Renaud et al., 2010). The current prevalence of visual impairment and subsequent emotional distress resulting from visual impairment illustrates the need for a specialized treatment to enhance quality of life using an evidenced-based approach (Brody, et al., 2001).

Various iterations of Cognitive Behavioral Therapy (CBT) have demonstrated efficacy in reducing depression and improving overall quality of life in a wide array of populations including patients with chronic pain (Smeets, Vlaeyen, Kester, & Knottnerus, 2006), substance use (Dutra et al., 2008), insomnia (Okajima, Komada, & Inoue, 2010), eating disorders (Hay, Bacaltchuk, Stefano, & Kashyap, 2009), somatoform disorders (Kroenke, 2007), and depressive disorders (Tolin, 2010). CBT focuses on the relationship between emotions, current maladaptive or dysfunctional behaviors, and an individual’s cognitions about oneself, the future, and the world (Beck, 1976).

As it relates to physical disability, CBT based interventions are thought to work by modifying underlying cognitive distortions associated with the onset of feelings of hopelessness and low self-efficacy, in addition to enhancing skills to manage the difficulties of life (Shnek et al., 1997).

Specific cognitive distortions have been found to negatively correlate with the lower quality of life following the onset of a disability and include overgeneralization, catastrophizing, personalizing, and selective abstraction (Smith, Follick, Ahern, & Adams, 1986). For example, overgeneralizing can become associated with functional limitation if an individual perceives their inability to complete a relatively mundane task (i.e. difficulty selecting matching clothing) as a generalized inability to complete all tasks. In this manner, the disability may spread to encompass important aspects of the individual’s life and may come to reduce autonomy and independence in other domains.

As mentioned above, the onset of visual impairment can be a traumatic and deeply personal loss. In many ways, when an individual becomes visually impaired, they lose important self-defining features extending far beyond the ability to see, including their individual sense of value, what they can offer to their loved ones, and how they may contribute to society more generally (Tuttle & Tuttle, 1996).

Given that visual impairment can be a significant crisis necessitating adaption, and ultimately an acceptance of a new reality, using an adaptation to disability model to understand an individual’s emotional response to vision loss, along with the concept of acceptance, is warranted. Because of the significant role cognitions have in the development and continuance of diminished quality of life, particularly when addressing the innumerable challenges those with decreased vision face, there is evidence to suggest a CBT approach can be useful to address the underlying cognitions contributing to these profound emotional difficulties. Furthermore, because of the daily challenges low-vision individuals face, a treatment modality that encourages adaptive problem-solving is also suggested.

Purpose of the Study

The purpose of the study is to systematically evaluate a group intervention for individuals with visual impairment. The study examined levels of depression, cognitive distortions, levels of acceptance, and overall quality of life among individuals who are visually impaired. The responsible researcher, with research assistants, administered and assessed responses to a cognitive behaviorally-oriented problem-solving intervention, modified for individuals with visual impairment.

The intervention for the current study, group Problem-Solving Therapy (PST), was originally developed by Nezu, Nezu, and D'Zurilla (2013) and includes instruction on how to solve problems in a systematic way, how to regulate distressing emotions, and how to alter maladaptive cognitions to reduce symptoms of depression and anxiety. The PST manual was adapted to make examples more germane to a visually impaired population and to be more amenable to group administration. The Inventory of Cognitive Distortions (ICD; Yurica, 2002) was administered to understand the cognitive mind sets of those individuals living with low-vision. The ICD was also used to understand the frequency and type of specific cognitive distortions, so that they may be addressed in future interventions.

Moreover, successful coping and adaptation to the loss of vision, as is intended in our intervention, has been associated with improved psychosocial functioning (Nyman, Dibb, Victor, & Gosney, 2012) and increased self-efficacy, especially when individuals accepted the limitations of vision loss and attributed accomplishments to personal abilities and efforts, rather than external factors (Dodds et al., 1994). These findings suggest that the ability to manage difficulties and the acceptance of vision loss promotes overall coping skills relating to decreased vision.

In summary, it was hoped that the study would help to further illuminate the underlying cognitive and behavioral processes of individuals with visual impairments, validate PST as a group intervention for individuals with visual impairment, increase awareness of the roles of cognitive distortions and acceptance in treating people with impaired vision, and expand the resources for individuals living with visual impairment. It is hypothesized that the intervention will lead to improved access to effective behavioral health care for those living with visual impairment.

Chapter 2: Literature Review

Depression

Depression is one of the most debilitating of all mental disorders. According to the World Health Organization (2004), depression is the third leading cause of disability worldwide. In the United States the cost of depression when considering loss of productivity, absenteeism, and other factors is estimated to total $210.5 billion annually (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015), which is an increase from the $83 billion annually estimated in 2000 (Greenberg, et al. 2003). Depression affects nearly every aspect of an individual’s life and can have untold consequences on functioning.

One study monitored a group of siblings and their parents over the course of 40 years to determine the long-term consequences of depression and other psychological problems (Smith & Smith, 2010). The researchers discovered that those children who were diagnosed with a psychological illness, including depression, were less likely to be married, had annual income reduced by 20%, and had less total family assets as adults. Total life-time loss of income was found to be about $300,000 (Smith, Monica, & Smith, 2010). In addition, those who are diagnosed with depression showed an exacerbation of current medical illnesses and subsequently utilized the healthcare system more frequently than those who were not diagnosed with depression (Simon & Katzelnick, 1997), further straining an already fragile U.S. healthcare delivery system.

Depression is a broad diagnostic heading which encompasses many different diagnoses included within the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (APA, 2013). Despite the many different types of depressive disorders, Major Depressive Disorder (MDD) and Persistent Depressive Disorder are the two primary disorders to be discussed in this literature review. Although depressive symptoms associated with bipolar disorder diagnoses cause significant distress and impairment, this disorder is beyond the scope of this work.

MDD is perhaps the most well-known depressive disorder and is episodic in nature. Symptoms of depression represent a marked change in affect and cognition and must last for at least two weeks or more, though many episodes last much longer (APA, 2013). MDD is characterized by an individual meeting at least five of the following criteria; a markedly depressed mood, diminished interest or pleasure in activities, significant weight loss/weight gain, insomnia/hypersomnia nearly each day, psychomotor agitation or retardation, fatigue or energy loss, difficulties with concentration, and recurrent thoughts of death or dying (APA, 2013). It is important to delineate normal and expected sadness following the death of a loved one or significant loss, such as the loss of vision, from an episode of MDD. While the loss of a loved one typically, and understandably, may well induce feelings of great sadness, the loss does not typically result in symptoms consistent with a full-blown major depressive episode (APA, 2013).

Persistent Depressive Disorder (PDD) was previously identified as dysthymic disorder in previous iterations of the DSM (APA, 2000). PDD is identified by symptoms of depression that are less severe, however, are substantially longer in duration. Individuals meeting diagnostic criteria for PDD exhibit at least two of the following symptoms for at least two years: overeating or diminished appetite, sad mood, insomnia or hypersomnia, low-energy or feeling fatigued, low self-esteem, poor concentration, and feelings of hopelessness (APA, 2013). Individuals who meet the criteria for PDD can be described as being persistently sad or may report feelings of being “down in the dumps” (APA, 2013). Though symptoms are notably less severe, the chronicity of the low mood may contribute to functional impairment equivalent to that of MDD, and at times may be more significant (Rhebergen et al., 2009).

Studies have shown that individuals with diagnosable depressive disorders show reduced quality of life (QOL) relating to health and eventually experience greater levels of disability over time (IsHak, et al., 2011). These findings are particularly relevant when considering the population of interest in this study, the opportunities to improve QOL, and reduce the impact of disability with treatment.

Depression affects the way individuals think about themselves and the world, alters social behaviors, and disrupts basic human needs such as sleep and eating behaviors. A significant loss, such as the loss of vision, vocation, independence, and/or leisure activities, has long been shown to be a risk factor for the development of depression, particularly when this occurs suddenly or late in life (Cole & Dendukuri, 2003). Given the scope and breadth of ways depression manifests in those affected, a discussion on varying theories related to the development and maintenance of these symptoms is warranted. The following offers a brief discussion of the current understanding of depression through a behavioral framework, a cognitive understanding, and also theories regarding biological etiologies of depression.

Behavioral Theories of Depression. There are a number of functional analytic models of depression that seek to explain the symptoms through understanding the purpose of constituent behaviors associated with the disorder; for example, understanding the function of decreased social interactions and how such behavior relates to the perpetuation of depression. Ferster (1971) proposed that depression is the result of changes in an individual’s environment that reduce the opportunities for positive reinforcement, resulting in fewer behaviors to be reinforced. Ferster (1971) suggested it is a deficit in positive reinforcement and behavioral reduction that subsequently results in depression. Ferster (1981) suggested the experiences of individuals over time subtly shape behaviors; individuals who live with MDD or PDD, it is hypothesized they experience low rates of positive reinforcement and subsequently come to engage in a less reinforcing lifestyle. As a result of this lifestyle, a pattern of avoidance and escape comes to be associated with more depressed feelings. As time elapses and these behavioral patterns continue, behaviors that could have been associated with positive reinforcement are extinguished while avoidance and escape behaviors are strengthened (Ferster, 1981). Because of the escape and avoidance behaviors, limited opportunity for positive reinforcement are encountered, which drive symptoms commonly associated with depression.

Lewinsohn's (1974) model is closely related to Ferster's (1981) description. However, Lewinsohn's model provides a somewhat different interpretation, focused more on response contingent positive reinforcement (RCPR), or pleasure derived from interactions with the environment, and the role it plays in the manifestation and perpetuation of depression. Lewinsohn (1974) suggested that depression and associated symptoms develop as a result of lower rates of RCPR for three primary reasons. Firstly, low rates of RCPR may be due to a small number of possible events that are positively reinforcing for an individual; depression develops because the individual is not exposed frequently enough to activities or actions that are reinforcing (Lewinsohn, 1974). Secondly, Lewinsohn proposed low RCPF may be a function of diminished value of possible reinforcers; despite the presence of possibly reinforcing behavior, the value of the reinforcement may not be of sufficient magnitude, duration, or immediacy. Lastly, a lack of skills possessed by the individual may lead to decreased rates of RCPF (Lewinsohn, 1974); these include poor social skills or inadequate abilities to achieve positively reinforced behaviors.

Significant overlap exists between the aforementioned models. Taken altogether, however, depression from a behavioral perspective is understood as relating to the amount, frequency, and quality of positive reinforcement available to an individual (Ferster, 1971; Lewinsohn, 1974). The development and persistence of depression is thought to occur as the byproduct of the relationship between the individual and the environment in which they function. From a behaviorist perspective, depression is seen as the result of a limited amount of positively reinforced behaviors and the behavioral changes associated with variable reinforcement schedules.

Cognitive Theories of Depression. Cognitive models of depression are predicated on the belief that individuals become depressed because of the way they receive, process, and interpret information about the world around them (Ingram, Williams, Sharp, & Harfmann, 2015). These approaches focus on the internal experiences rather than external or environmental factors. One of the most well-known models is Beck's (1976) cognitive theory. Essentially, this model suggests dysfunctional thoughts, commonly referred to as cognitive distortions, that subsequently influence behaviors and emotions, are common to all psychopathology, including depression (Beck, 1979; 2011).

The cognitive model proposes depression is the result of activation of a particular depressive schema by something in the environment or memory. Schemas, for individuals who live with depression, are negatively skewed mental themes that shape the way information is perceived and appraised (Ingram, Williams, Sharp, & Harfmann, 1998). Negative schemas develop from lived experiences, especially early in life, that include social interactions, relationships with family members, and experiences at school or the community (Ingram et al., 1998). For example, an individual who experiences a great deal of criticism at home and at school as a child may develop a schema surrounding being a failure, unlovable, or worthless. While it is true that all individuals have certain schemas, individuals who live with depression develop schemas that lead to negative appraisals of themselves, the future, and the world; which Beck, Rush, Shaw, and Emery (1979) termed the negative cognitive triad. In many ways, a schema is the lens through which external information is filtered and through which individuals see the world. For individuals with depression, as new information is filtered, negative interpretations are formed and depressive symptoms of dysphoria, behavioral inhibition, social isolation and social withdrawal, and other negative symptoms manifest as a result.

While schemas are deeply held beliefs, the cognitive model suggests there are other representations of these deep beliefs evident in everyday interactions. As a result of these schemas, individuals develop negative thoughts or distorted perceptions that create and perpetuate depression (Beck, 2011), which will be discussed a greater length in an upcoming section.

Biological Theories of Depression. Recent advancements in medical technology have expanded researchers' abilities to use various methods to analyze the human body. Recently, researchers investigating mood disorders have found a number of biological markers for depression, including neurobiological anomalies, genetic differences, physical variations in brain structures, and specific neurotransmitters linked to the development of depression (Johnson, LeMoult, Vanderlind, & Joorman, 2015). These findings suggest physiological differences contribute to the onset of depression rather than strictly a behavioral or cognitive etiology of the disorder.

The driving factor of genetic models for explanations for mood disorder is the fact that individuals who come from families who have mood disorders are more likely to develop the same mood disorder themselves (Johnson, LeMoult, Vanderlind, & Joorman, 2015). Twin studies have provided insight into this familial/genetic phenomenon and the apparent heritability of depression. One particularly large-scale twin study using 3790 complete monozygotic and dizygotic twin pairs found that nearly 40% of the variability for the development of MDD was due to genetics (Kendler & Prescott, 1999). Another similar study using adolescents found comparable results; heritability was also found to be 40% for MDD (Rice, 2010). While there appears to be a heritable component of MDD, finding specific genes associated with the development of the disorder has proven elusive. For example, over the past decade there have been a considerable number of studies attempting to replicate provisional gene identification studies, however, many of these replication studies have been unsuccessful (Johnson, LeMoult, Vanderlind, & Joorman, 2015).

One of the most widely researched genes thought to be associated with the development of affective disorders is the serotonin transporter linked polymorphic region (5-HTTLPR). This gene reduces the serotonin uptake at the neuronal synapse and has been thought to be associated with the development of depression and other mood disorders (Johnson, LeMoult, Vanderlind, & Joorman, 2015). That said, recent meta-analytical findings are competing; one meta-analysis (Karg, Burmeister, Shedden, & Sen, 2011) found strong evidence that 5-HTTLPR moderates the relationship between depression and stress while a slightly older study (Risch, Herrell, & Lehner, 2009) uncovered no evidence the 5-HTTLPR is associated with the onset of depression. In a study using a daily stress log, researchers discovered daily stress levels were correlated with the internalization of depressive symptoms, but only for individuals with the 5-HTTLPR-S gene. Interestingly, researchers found relationships between the presence of the 5-HTTLPR and a tendency to internalize both distress and fear, suggesting the 5-HTTLPR gene may contribute to emotional reactivity more broadly, rather than exclusively to unipolar depression (Conway, Slavich, & Hammen, 2014). The evidence for gene involvement in the development of depression is far from clear, however, much more is known about the role of specific neurotransmitters to the onset of depression.

The interest in the role neurotransmitters play in MDD came about as a response to benefits observed after particular medications targeted certain aspects of brain chemistry (Johnson, LeMoult, Vanderlind, & Joorman, 2015). Decreased levels of both serotonin (Booij et al., 2005) and dopamine (Dunlop & Nemeroff, 2007) have been found to be a possible contributing factor to depression, while changes in norepinephrine levels have also been identified as a biological component driving depressive symptoms (Altshuler et al., 1995).

Neuroendocrine findings suggest another key chemical may contribute to the development of depression. Cortisol, a hormone commonly associated with stress and worry, has been found by multiple meta-analytical studies to be elevated and otherwise dysregulated in individuals who experience symptoms of MDD (Knorr, Vinbert, Kessing, & Wetterslev, 2010, Yehuda, Teicher, Trestman, Levengood, & Siever, 1996).

Neurological Structure. In addition to neurotransmitter variation and differences in neuroendocrine functioning, research suggests there may also be physical differences and disparity in activation levels of varying brain structures responsible for the experience and regulation of emotion. The amygdala has been demonstrated to play a prominent role in the experience of emotional stimuli, particularly stimuli related to negative emotion (Johnson, LeMoult, Vanderlind, & Joorman, 2015). While studies evaluating the actual size of the amygdala and its relation to the experience of depression have been inconsistent, investigation into activation levels of the amygdala have been more fruitful. Research suggests that amygdala hyperactivity seems to be associated with the development and of MDD. Amygdala hyperactivity has also been identified in high risk populations for developing depression

(Johnson, LeMoult, Vanderlind, & Joorman, 2015).

The hippocampus has also been implicated in depression and those living with depression have demonstrated a tendency to remember more negative life events than those who are not depressed (Joorman, 2009). Given this tendency, the hippocampus, long associated with consolidation and retrieval of memory, has been a focus of researchers searching for biological explanations of depression. Diminished hippocampal volume has been documented in both individuals with MDD as well as individuals who report no symptoms of MDD but have a familial history of depression (Amico et al., 2011). Additional imaging studies have uncovered decreased hippocampal activity during cognitive recollection tasks when compared with individuals who are depressed (Milne, MacQueen, & Hall, 2012). These studies suggest both the structure as well as the function of the hippocampus are implicated in the development of depressive symptoms.

With the advent of new technologies allowing for more advanced imaging of neurological activity, it is likely that more detailed models of neurological structures and their role in the development and perpetuation of depression will emerge. Irrespective of the underlying reasons for the development of depression, it remains one of the costliest and debilitating illnesses worldwide.

Integrated Models of Depression. Depression has a number of underlying contributing mechanisms that include behavioral, cognitive, genetic, and biological factors. Newer models of depression seek to integrate biological, cognitive, and evolutionary perspectives to explain the development of the disorder. It has been suggested depression can be viewed as a way to conserve energy and resources after an individual perceives themselves to lose a vital resource, such as a desired relationship, identity within a group, or an important personal possession or asset, such as the ability to see (Beck & Bredemeier, 2016).

It is speculated the underlying reasons for negative appraisals may be biological in nature and can lead one to process information with a negative skew, particularly about oneself, the future, and the world (Beck & Bredemeier, 2016). Essentially, an individual who experiences a loss, either real or perceived, ceases to make efforts that require investment of energy, as it is viewed as unlikely to result in a desired outcome. The tendency toward these hopeless beliefs are theorized to be biological in nature and result in symptoms associated with depression such as anhedonia, lower energy, and hypersomnolence (Beck & Bredemeier, 2016). It is postulated these depressive responses were likely adaptive during the course of human evolution, at times when resources were scarce, however, in modern times they have largely lost their utility (Beck & Bredemeir, 2016). Such behavioral inactivity, dysphoria, social withdrawal, and other depressive symptoms seem especially maladaptive for individuals with visual impairment, who may require even more effort and assistance than before.

Visual Impairment in the United States

Visual impairment is an exceedingly complex and nuanced topic for a number of different reasons. Because of the historically varied definitions of visual impairment, corrective measures to improve visual acuity, and different means of extrapolating data, global estimates of individuals affected have been difficult to surmise. In 2002, it was estimated that nearly 161 million persons worldwide lived with visual impairment, which included 37 million individuals who were completely blind (Resnikoff et al., 2004). The total number of individuals affected was revised in 2006 when the actual prevalence of global visual impairment was thought to be nearly 259 million individuals, with 42 million individuals living with complete blindness (< 3/60 in the better eye) (Dandona & Dandona, 2006). Recently, more conservative estimations suggest 188.5

million people live with mild visual impairment (<6/12 but 6/18 or better), 216.6 million live with moderate to severe visual impairment (<6/18 but 3/60 or better), and 36 million live with blindness (<3/60) (Bourne, et al., 2017).

When turning the focus to the United States, estimates of visual impairment and the demographic information are striking. 23.7 million American adults over the age of 18 live with visual impairment; broken down by gender, 14 million women and 9 million men live with visual impairment (Center for Disease Control and Prevention, 2015). Additionally, of Americans who live with visual impairment over the age of 25, four million (21%) have less than a high school diploma, 5.1 (27%) million have a high school diploma or equivalent, 5.8 million (30%) have some college education, and 4.1 million (22%) have a bachelor's degree or higher (Blackwell, Lucas, & Clarke, 2014). Overall, when compared to individuals without a disability, individuals with impairment generally attain lower levels of education; 79% of adults with a disability attained at least a high school diploma while 90% of adults without a disability achieved at least a high school diploma. Furthermore, approximately 17% of individuals with a disability go on to attain at least a bachelor’s degree while 35% of individuals without a disability complete bachelor’s degree requirement (Ryan & Bauman, 2015), which illustrates a marked disparity in educational attainment for those living with a disability. When examined regionally, stark differences are observed in the United States. The Northeast accounts for 3.8 million people living with visual impairment, the West and Midwest account for 5.4 and 5.3 million people respectively, while the South has 9.2 million people currently living with visual impairment (Center for Disease Control and Prevention, 2015). Large regional differences are suspected to be attributable to access and quality of preventive healthcare services in those regions. When broken down by age, 16.4 million Americans between the ages of 18-64 are visually impaired and 7.3 million individuals over the age of 65 live with visual impairment (Center for Disease Control and Prevention, 2015). Given the large number of individuals living with visual impairment, it comes as no surprise there is also an enormous economic impact felt as a result of this disability.

Understanding the economic costs, both socially and individually, associated with a particular condition is essential in making a fiscal argument to reduce the burden of the condition through intervention. However, ascertaining the exact dollar amount associated with visual impairment has been difficult and there are competing estimates. Many of these differences can be attributed to varying definitions of the term visual impairment and the inclusion of corrective lenses in estimates. Early figures from a 1992 study suggested the economic cost of blindness related disability to be approximately $12,000 per person annually, which, when totaled, approached $4 billion in 1992 dollars (Chiang, Bassi, & Javitt, 1992). Follow-up research reported an increase in the annual cost of visual impairment. In one study, visual impairment and blindness were found to be associated with higher utilization of medical care, decreased health utility, and increases in in-home care, which were estimated to costs $5.5 billion annually (Frick, Gower, Kempen, & Wolff, 2007). In another study, researchers examined direct care costs, medical costs, and productivity losses of individuals living with any visual impairment, including those with refractive errors correctable through eye glasses. In the analysis, the total annual economic burden was $35.4 billion dollars; $16.2 billion in direct medical costs, $11.1 billion in other direct costs, and $8 billion in productivity loses (Rein et al., 2006).

The prevalence of visual impairment seems to be increasing. By 2050, it is estimated the number of individuals with legal blindness will grow 21% each decade to 2 million individuals (Varma et al., 2016). Additionally, visual impairment will increase by 25 percent each decade, resulting in twice as many individuals affected by the year 2050. The individuals most likely to be affected by the growing burden of visual impairment and blindness will be those over the age of 80 due to increased risk for age-related eye disorders (Varma et al., 2016).

Visual impairment in the United States has a number of precipitating factors, including both age related degeneration of cells and tissue as well as underlying medical conditions (Eye Disease Prevalence Research Group, 2004). Misshapen lenses are one of the most common forms of visual impairment and are known as refractive errors. Refractive errors are responsible for the development of myopia (near-sightedness) and hyperopia (farsightedness), and can generally be corrected by spectacles, contact lenses, or surgery (Congdon, Friedman, & Lietman, 2003). Another contributor to visual impairment in the United States is cataracts. In addition to being the leading cause of visual impairment in the world (Thylefors, Negrel, Pararajasegaram, & Dadzie, 1995), cataracts accounts for the declining vision of 20.5 million Americans (Congdon, Friedman, & Lietman, 2003). Another cause of visual impairment is glaucoma, an incurable optic neuropathy which slowly narrows the visual field and eventually leads to complete blindness (Quigley, 1996). According to recent estimates, 2.2 million Americans currently live with glaucoma, with that number expected to increase in coming years due to an aging population (Congdon, Friedman, & Lietman, 2003). Age-related Macular Degeneration (AMD), an incurable yet treatable disease eventually resulting in blindness for many affected, predominantly impacting individuals of European descent, affects 1.8 million Americans with that number expected to reach 3 million by 2020 (Congdon, Friedman, & Lietman, 2003). Lastly, diabetic retinopathy is another cause of visual impairment in the United States and is the result of damaged blood vessels in the eye secondary to excessive serum glucose saturation. 7.7 million people currently live with diabetic retinopathy in the United States (Prevent Blindness

America and National Eye Institute, 2012), with these figures expected to increase in future decades as treatment of diabetes improves, access to preventive care becomes more attainable, and rates of obesity remain high throughout the population (Saaddine et al., 2008).

The sheer volume of individuals currently living with visual impairment in addition to those who are expected to develop visual impairment in the near future represent an enormous strain on the United States' already overburdened healthcare system as well as on patients and their families. In addition to treatment for eye-related care, individuals with visual impairment utilize the healthcare system at a higher overall rate than same aged peers by experiencing more symptoms of hypertension and cardiovascular disease than others in their age group (Carabellese, et al., 1993). For people with various visual impairments, given the compounding effects of economic and health concerns, decreased visual acuity and resultant stress, it is important to consider matters of mental health.

Emotional Challenges Associated with Visual Impairment. In addition to the economic impact of visual impairment, there is also a profound human consequence of a reduction in visual acuity, with a growing body of evidence to support the need for psychological intervention in this population. Individuals with visual impairment experience vision loss in a variety of ways that includes decreased acuity, reduced contrast sensitivity, compromised depth perception, and restricted visual fields. While some individuals adjust to visual impairment with relative ease and avoid psychological sequelae (Kleinschmidt, 1999), an estimated 25-33% of individuals who become visually impaired experience some level of depression (Horowitz, 2004). Even when other variables are controlled for, individuals with visual impairment are found to suffer high levels of depression when compared to same aged peers (Carabellese, et al. 1993).

These negative emotional experiences, given the various domains visual impairment impacts, are not without reason. Individuals who become visually impaired typically experience sweeping and broad ranging changes to their activities of daily living and must make fundamental changes to the way they live their everyday lives, and interact with friends, family, and with members of their community at-large (Nyman, Dibb, Victor, & Gosney, 2012). Individuals who become visually impaired must address and overcome barriers related to personal care challenges such as bathing, eating, dressing, diminished ability to complete more instrumental tasks such as grocery shopping, maintaining their living space, safely navigating private and public spaces, and in preparing meals (Burmedi, Becker, Heyl, Wahl, & Himmelsbach, 2002). Each of these barriers represent a unique challenge for those living with visual impairment to overcome.

As a consequence of decreased visual acuity, individuals with visual impairment are more likely to suffer trip and fall injuries, potentially resulting in long-term injury (Ramrattan, Wolfs, Panda-Jonas, et al., 2001). Given the severity of the risk associated with falling, particularly in an elderly population, it is unsurprising that individuals develop a fear of instability and, in some cases, begin to restrict their mobility and greatly reduce community-based activities (Murphy, Dubin, & Gill, 2003). Consequently, the onset of visual impairment has been linked to feelings of dependence, senses of inferiority, hopelessness, helplessness, worthlessness, loneliness, denial, and anxiety (Dodds, et al., 1994; Upton, Bush, & Taylor, 1998).

Because of the high prevalence of depression in this population, visual rehabilitation specialists have been advised to become more knowledgeable about recognizing and treating depression.

In an effort to provide context for the emotional difficulties and functional impairment accompanying visual impairment, a number of studies have demonstrated the severe impact of the loss of vision. One study found that rates of depression in vision impairment are comparable to other chronic conditions such as stroke, heart disease, and loss of hearing (Huang, Dong, Lu, Yue, & Liu, 2010). Other quantitative research suggests eye disorders affecting visual acuity, like age-related macular degeneration, affect patient's QOL similarly to the impact of advanced prostate cancer, incontinence, severe sexual dysfunction, and intractable chronic pain (Brown et al., 2005).

After controlling for variables such as gender, race, marital status, education level, home living situation, level of employment, body mass index, and other health related conditions, depression remained significantly correlated with the loss of eyesight (Zhang, et al., 2013). Specifically, the functional losses accompanying visual impairment, as opposed to the loss of actual visual acuity itself, was positively correlated with depression (Zhang et al., 2013). This is consistent with earlier findings suggesting the depression and mood disturbances found with those who are visually impaired are more closely correlated with the subsequent functional impairment rather than vision loss itself (Rovner, Zisselman, & Shmuley-Dulitzki, 1996).

Further, the severity of the visual impairment is not always commensurate with the levels of depression experienced by individuals (Dreer et al., 2008). One study examined 86 adults with AMD who were blind in at least one eye. When individuals with blindness in one eye were compared to those who had lost vision in both eyes, results showed the group with single eye blindness were more distressed, exhibited more anger, were more depressed, and more anxious than individuals who had lost vision in both eyes (Williams, Brody, & Thomas, 1998). These findings suggest that, somewhat paradoxically, individuals with less severe visual acuity may actually experience more angst and depression than their more severely impaired counterparts. Researchers from this study posited the uncertainty regarding the future may have accounted for these differences (Williams, Brody, & Thomas, 1998).

Similar results have been found for quality of life. One hundred six elderly individuals with AMD were assessed on measures of visual impairment and QOL. Individuals with visual impairment in the mild and moderate range showed equally low scores on measures of QOL and ability to pursue leisure activities (Hassell, Lamoureux, & Keeffe, 2006). This finding is consistent with behavioral theories of depression; levels of depression increase when individuals lack positive reinforcement as a result of decreased engagement with their environment (Lewinsohn, 1974).

In addition to living with higher levels of depression than non-visually impaired peers, those with vision loss must also live with the possibility of more serious behavioral health outcomes. While men seem to be more at risk than women, individuals living with serious physical disabilities, which include visual impairment, are also at heightened risk for suicide (Waern et al., 2002), with some estimates suggesting those living with a physical disability are four times more likely to make a suicide attempt (Meltzer et al., 2012) The wide ranging and serious outcomes associated with visual impairment make this a serious public health risk and one that behavioral health professionals are uniquely equipped to address. Acceptance of visual impairment is instrumental in this study given it represents openness to accept short-comings and often accompanies a decrease in depressive symptoms.

Adaptation to Disability

The first formal investigation into the social and emotional problems stemming from physical disability was conducted in 1956 (Dembo, Leviton, & Wright, 1956) and explored self-perception, value, and loss. Prior to this study, the field of psychology largely ignored emotions as a singular construct of interest as evidenced by the relative dearth of academic publications focusing on emotions; four of 200 submitted papers fell under the heading of emotions at the 1947 American Psychological Association meeting (Dembo, Leviton, & Wright, 1956). While the researchers at Stanford, in collaboration with the Army Medical Research and Development Board of the Office of the Surgeon General, focused primarily on the relationship between individuals who had suffered a debilitating injury and those who had not, the study was important in that it highlighted the significance of the perception of what the disability meant rather than the disability itself, and brought to the fore the importance of emotional considerations relating to injury and disability.

The Dembo, Leviton, and Wright (1956) study interviewed 177 injured individuals, predominantly World War II veterans with injuries ranging from amputations to facial disfigurement, along with 65 non-injured subjects. Subjects were asked a series of open- and close-ended questions designed to illuminate challenges in the relationship between injured and non-injured individuals and to understand better how these challenges may be overcome (Dembo, Leviton, & Wright, 1956). This study also helped to highlight differences in the way individuals adjust to life following the onset of an injury or disability and underscored the importance of how individual variations in self-perception can alter an individual’s outlook; addressing the question of what this disability means as it relates to an individual’s role as a parent, spouse, and employee, etc. is central to understanding the emotional processes of individuals with disabilities and injuries (Dembo, Leviton, & Wright, 1956). Additionally, in referring to both personal loss (i.e. loss of a physical ability) and social loss (i.e. to be considered inferior by peers), researchers discussed the importance of problem-solving stating, “understanding these conditions is actually a first step toward solving problems of adjustment, for only when they are clearly specified can we tell what it is that must be changed, and only then are we able to get some insight regarding the state to which it would be desirable to change and how to produce the change," (Dembo, Leviton, & Wright, 1956, p. 33). Perhaps the most intriguing finding of this study relates to that of acceptance of loss; coming to terms with the extent of an individual's limitations. The implication is not that an individual must relinquish valued aspects of their lives to accomplish acceptance. Rather, it is revaluation, a restructuring or recalibration of what one finds to be important that leads to acceptance (Dembo, Leviton, & Wright, 1956). This early finding suggests alterations in cognitions can lead to a steadier journey toward acceptance.

Acceptance

The terms acceptance and adjustment have been used interchangeably in some of the literature over the years. Acceptance, as it relates to acquired physical disability, has been the focus of research for decades, particularly as it relates to locus of control; the extent to which people feel they have control over occurrences in their lives (Rotter, 1966). A number of studies with varying groups of individuals with physical disabilities, such as spinal cord injuries (Mazzulla, 1984), multiple sclerosis (Brooks & Matson, 1982), and those on hemodialysis (Poll & De-Nour, 1980) all found that individuals with more internal locus of control demonstrated a more positive score of adjustment or acceptance of their circumstances.

Acceptance, as a construct, can be broken into separate categories. First, there exists a cognitive type of acceptance in which an individual acknowledges the realities of their disability, restructures life goals and values, and develops a new sense of self-concept (Martz, Livneh, & Turpin, 2000). Second, there is a socio-behavioral acceptance where individuals with disabilities develop a positive self-worth, engage in vocational or avocational goals, and effectively overcoming obstacles that come up during these pursuits (Martz, Livneh, & Turpin, 2000).

More contemporary definitions of acceptance utilize a similar framework for understanding adjustment to a physical disability and psychopathology more broadly. Acceptance is defined as both willingness to engage in behaviors and an openness to psychological experiences (Hayes, Strosahl, & Wilson 2012). The primary question relating to acceptance is asking whether or not the individual with visual impairment is able to embrace their diminished vision and whatever has resulted from it, even when the vision loss has brought about painful emotional experiences such as grief, shame, or depression (Hayes, Strosahl, & Wilson, 2012). In essence, it is the openness to experience feelings, painful or otherwise, in a non-judgmental way while continuing to engage in behaviors that promote a rich and fulfilling life.

Acceptance of Loss Theory. The acceptance of loss theory represents an expansion of the previously discussed Dembo, Leviton, and Wright (1956) work, which was the first exploration of the emotional adjustment after an injury or disability. This section will discuss the four primary tenets of the acceptance of loss theory, proposed by Wright (1983) and expanded by Keany and Gleuckauf (1993), which includes the enlargement of the scope of values, subordination of physique relative to other values, containment of disability effects, and transformation of comparative-status to asset (intrinsic) values. Secondly, this section aims to highlight the importance of acceptance following the onset of visual impairment.

The first tenet of the acceptance of loss theory, the enlargement of the scope of values, posits an initial mourning period in which an individual experiences grief over the valued ability or traits they believe to have been lost (Keany & Gleuckauf, 1993). Experiences of grief are unique and fall on a continuum; some individuals may experience an all-encompassing feeling of sadness while another may lament the specific loss of a particular ability or trait. The enlargement of the scope of values, Wright (1983) suggests, occurs when an individual becomes aware of the importance of values that differ from the values they presume to have lost; individuals begin to identify other important aspects of their lives unaffected by the disability. There are a number of potentially initiating factors for the enlargement of the scope of values, which include management of activities of daily living or the desire to relieve oneself of feelings of sadness (Keany & Gleuckauf, 1993). Ultimately, when an individual is able to find or create meaning in physical attributes, capabilities, activities, or aspiration they are enlarging the scope of values (Keany & Gleuckauf, 1993).

Subordination of physique relative to ability or other values is the second tenet of the acceptance of loss theory and it relates to an individual’s level of attention on outward appearance in relation to other domains of their life. A heightened focus on physical characteristics following an injury or disability, particularly if physical attributes are assumed to be lost, may cause the individual to discount other values such as intellect, work ethic, creativeness, companionship, and family relationships (Keany & Gleuckauf, 1993). As an individual considers broader values apart from physical attributes or outward appearance, other intrinsic values begin to hold more weight. As a result, an individual’s intellect and social abilities may become more important relative to outward appearance or physical capabilities (Keany & Gleuckauf, 1993).

The third tenet of the acceptance of loss theory is containment of disability effects, which refers to the necessity of an individual to mitigate the spread of limitations into other valued aspects of their lives (Keany & Gleuckauf, 1993). The containment of disability can also range on a continuum. If an individual perceives their disability or limitation to be inextricably linked to their character, spread or overgeneralization of the perception of disability is likely to occur;

the individual may view themselves as completely disabled, rather than limited in a particular, although important domain (Keany & Gleuckauf, 1993). The opposite end of this spectrum represents an individual who views their disability as a possession rather than an indelible mark on their person; the disability is perceived as separate and, therefore, is perceived as a discrete part of the individual as opposed to the defining feature (Keany & Gleuckauf, 1993).

The final tenet of the acceptance of loss theory is the transformation of comparative-status values to asset values. This tenet is related to the way in which an individual with a disability is able to view objects or abilities based upon their intrinsic value rather than engaging in upward social comparison by comparing themselves against others or some arbitrary higher standard (Keany & Gleuckauf, 1993). The comparative-status approach can cause self-devaluation because of their inability to meet an artificially higher standard, whereas the asset value approach allows individuals to recognize the inherent qualities in remaining abilities (Keany & Gleuckauf, 1993). For example, a reading device may be devalued as it is inferior to using one’s eyes to read, or it may be highly valued for its usefulness as a way to read text and be more independent.

Taken altogether, these tenets allow for the restructuring of perceptions about oneself and the impact of a disability of impairment. Ultimately, each of these tenets rely on some cognitive flexibility and a willingness to consider values and abilities from a different perspective. Given the immense challenge vision loss presents, this may be challenging.

The onset of severe visual impairment represents a profound and often times permanent loss of a prior way of life. This emotional stress, and subsequent emotional response as a result of this loss, is shaped and modulated by cognitive appraisals (Lazarus, 1999). In this way, much of how an individual adapts is predicated on the perception of the loss itself. These appraisals can vary largely depending on individual factors, such as lived experiences or observation of how someone close to them handles difficulties. Individuals with positive cognitive appraisals may view a loss as an opportunity to grow while those with a negative cognitive appraisal may respond with hopelessness, depression, anxiety or anger (D’Zurilla & Nezu, 2010). Individuals are more likely to experience negative emotions as the result of a stressful situation, such as the loss of visual acuity, when they perceive the loss as harmful to their personal well-being, when they worry about their ability to cope in an effective way, or engage in coping strategies that are self-defeating, not helpful, or otherwise maladaptive in nature (D’Zurilla & Nezu, 2010).

Conversely, when examining what contributes to a more positive emotional response, much different cognitive appraisals are evident. Individuals who experience these less negative emotional responses tend to view stressful life events as challenges to overcome or opportunities; they have a belief that they are capable of managing the difficulty effectively, and engage in coping strategies that are self-enhancing, positive, and are effective (D’Zurilla & Nezu, 2010).

Visual Impairment and Quality of Life

Quality of life is a complex and multidimensional construct that seeks to assess an individual’s holistic wellness across various domains of life. The World Health Organization (WHO) defines quality of life (QOL) as, “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns,” (WHO, 1998, p. 10). QOL goes beyond the presence or absence of illness, but rather seeks to uncover the level of satisfaction an individual has with their life with regard to emotional/psychological functioning, physical health, personal beliefs, social relationships, and the relationship to features of the environment (WHO, 1998).

Individuals living with visual impairment have varied and unique experiences coping with the loss or severely deteriorated vision. That said, two factors seem to lead individuals living with visual impairment to experience lower satisfaction. Firstly, the inability to accomplish activities of daily living, previously perceived to be simple, results in feelings of disability, which in turn leads to schema activation of helplessness, worthlessness and unlovability (Horowitz & Reinhardt, 2002). Secondly, it has been reported that individuals experience an immense amount of fear associated with the onset of visual impairment (Horowitz & Reinhardt, 2002). Researchers hypothesize this broad feeling of angst manifests from the fear of dependence or helplessness that is mistakenly assumed to be an inevitability for those who experience deterioration in their visual acuity (Horowitz, 2004). The dichotomous overgeneralization that one will be globally and completely disabled and the assumption of future visual deterioration become driving factors in the development and maintenance of depressive symptoms (Horowitz, 2004).

There is broad-based empirical support suggesting that individuals with visual impairment report lower QOL than sighted individuals. A number of qualitative studies examining individual experiences of those living with visual impairment have been completed to better articulate individual experiences and provide a more detailed understanding of QOL issues. One study used a semi-structured interview to assess the lived experiences of ex-service members from the United Kingdom who had become visually impaired before the age of 55. Individuals described their onset of visual impairment with feeling sorry for oneself, dread, and depression (Stevelink, Malcolm, & Fear, 2015). One service member likened his visual impairment to being defective and stated, “You’re a broken toy now. What happens to broken toys… goes to the tip doesn’t it? … You know you’re a broken toy they don’t want to know you,” (Stevelink, Malcolm, & Fear, 2015, p. 3).

Another individual interviewed for the study stated,

> *"Well initially straightaway it [loss of vision] stopped me from going out straightaway. I went in for the first two years, first year and a half at least, I was very depressed. Very sorry for myself and thought that was it … I didn't think there was anything I could do so yeah, dread, full of dread and fear and all that lot did come into it."*

These two statements made by individuals who have recently lost their vision clearly articulate negatively held schemas regarding themselves, the world, and their futures. These statements also suggest individuals with visual impairment are often confronted with challenging situations and their inability to solve these problems contribute to overall disappointment and sadness.

Other studies with qualitative components note distinct patterns of self-report relating to feelings of frustration, annoyance, concern about decreasing visual acuity, and their abilities to cope with everyday life circumstances (Hassell, Lamoureux, & Keeffe, 2006). Additional concerns discussed related to the individual's inability to recognize faces and general inability to participate in leisure activities (Hassell, Lamoureux, & Keeffe, 2006). Difficulties with interpersonal engagement and ability to partake in valued leisure activities likely contributes to feelings of depression.

Review of these qualitative studies assessing the perceptions of those living with visual impairment is illuminating. Common themes of feeling defective or broken as well as feeling unlovable or unwanted permeate the literature and are particularly salient when viewed through the lens of cognitive behavioral therapy. Additionally, qualitative research has demonstrated a need for improved problem-solving. As ability levels change, so too must leisure activities and types of employment; visually impaired persons must rely on the support of others, learn new skills, utilize methods of assistance (e.g., walking canes or guide dogs), and generally adapt to new life challenges (Stevelink, Malcolm, & Fear, 2015). Given the need for individuals with visual impairment to readily adapt to a new and ever-changing life circumstances, the ability to accept one's physical limitations, regulate emotion, and solve ongoing problems in efficient and novel ways are essential to adaptive functioning following the onset of visual impairment.

Cognitive Behavioral Therapy and Distorted Thinking

Cognitive behavioral therapy has its roots in cognitive therapy, which was initially developed by Aaron Beck in the early 1960’s to reduce symptoms of depression (Beck, 1964). According to the cognitive model, perceptions about particular situations directly influences emotions, behaviors, and even physiological responses (Beck, 1964, Clark, & Beck, 2010). It is therefore believed to be an individual’s perception and interpretation of a situation that results in particular emotions, rather than the situation itself that is responsible for feeling states as well as behavioral and physiological responses.

Cognitive therapy also suggests individuals experience thoughts continuously, whether or not they are aware of them, in response to varying situations. These cognitions have been labeled as automatic thoughts, since they are presumed to occur spontaneously and without conscious effort (Beck, 1976). The way information is perceived and structured within the stream of consciousness is influenced by assumptions and beliefs, which have developed from previous interactions, experiences, and knowledge. These more stable underlying beliefs are known as schemas (Beck, 1976). Individuals living without disturbances in emotion, such as depression and anxiety, are presumed to have healthy, adaptive, and more accurate thoughts; however, according to the cognitive model, it is the activation of distorted, maladaptive beliefs that result in psychopathology (Beck, 1976; Beck, et al., 1979; Beck, 2011).

During the initial research conducted by Beck, it was discovered that patients diagnosed with depression demonstrated a negative bias in their cognitions, specifically seemingly continual uncontrolled negative thoughts about themselves, the future, and the world; the cognitive triad (Beck, 1976). Throughout the research, Beck discovered that depression remitted when negative cognitions were directly challenged and modified, either through behavioral experiments or Socratic questioning. Given these negative schemas and automatic thoughts are presumed to be misrepresentations of reality, an important component of Cognitive Therapy is the inclusion of reality testing assignments, thereby including components of behavioral therapy (Beck, 1976). As patients addressed negative cognitions while also changing behaviors, rapid improvements were noted related to mood, ability to function, and even in interpersonal relationships (Beck, 1976). While Cognitive techniques and Behavioral therapies were generally studied as separate treatments throughout the 1970's and 1980's in both the United Kingdom and the United States, the two approaches coalesced in the late 1980’s and early 1990's forming Cognitive Behavioral Therapy (CBT) (Rachman, 1997).

According to Beck, Rush, Shaw, and Emery (1979), Cognitive Therapy, and by extension CBT, are based on some of the following assumptions. Firstly, it is believed that perception and experiences are active and current processes that rely on both inspective and introspective data. Secondly, the way individuals think are indicative of the way they process both internal and external information and also appraisals of situations (Beck, Rush, Shaw, & Emery, 1979). These thoughts are suggestive of how the individual configures themselves in the present, how they view themselves, and how they view the past and future (Beck, Rush, Shaw, & Emery, 1979). Alterations of these underlying cognitions affect their behavioral patterns and through psychotherapy, individuals can become aware of how these thought patterns can influence emotional states and subsequent behaviors (Beck, Rush, Shaw, & Emery, 1979). Ultimately, it is the correction of these maladaptive thought patterns, known as cognitive distortions that can lead to clinical improvements (Beck, Rush, Shaw, & Emery, 1979).

Cognitive Distortions. Cognitive distortions represent mistakes in thinking about specific situations that lead to negative behavioral and emotional outcomes that include development of sadness, hopelessness, and feelings of anxiousness (Persons, 1989). Initially, Beck (1964) defined the following six types of cognitive distortions: absolutistic thinking, magnification, arbitrary inference, overgeneralizations, selective abstraction, and personalization. Later, more cognitive distortions were identified and original cognitive distortions were clarified. Burns (1980), simplifying Beck's terminology and adding a few of his own, identified ten different types of cognitive distortions which include all-or-nothing thinking, discounting the positive, emotional reasoning, jumping to conclusions, labeling, magnification or minimization, mental filter, overgeneralization, personalization, and should statements.

As stated previously, according to the cognitive model, cognitive distortions play an important role in both the development and perpetuation of depression (Beck, 1976), and this theoretical assumption has empirical backing in current research. In one recent study examining cognitive mechanisms relating to depression, it was discovered certain identifiable thought patterns are linked to more severe forms of depression. A study of 90 participants found that individuals with more serious forms of depression were more likely to display a negative expectancy bias, be more cognitively inflexible, and display less positive affectivity (Caouette & Guyer, 2016). Another older study seemed to confirm that increases in distorted thinking leads to heightened experiences of depression and low mood, when compared to non-depressed controls. The same study suggested participants with anxiety tended to have more total negative thinking and negative interpretations of unpleasant events than those with depression, who reported higher levels of hopelessness and dysfunctional attitudes (Blackburn, Jones, & Lewin, 1986).

Furthermore, a number of meta-analyses have affirmed CBT is more efficacious than no-treatment control groups and medication only groups to reduce unipolar depression, anxiety disorders, and trauma related disorders (Dobson, 1989; Butler, Chapman, Forman, & Beck, 2006). This supports the theory that treatment that attends to cognitive distortions is helpful for these disorders.

These maladaptive thinking patterns can be particularly damaging for an individual who has recently lost their visual acuity because it can result in overgeneralizing from one significant setback into a variety of different situations, magnify the likelihood of a catastrophic event occurring, mind-read the thoughts of others, and lead individuals to believe that they can fortune-tell future events with perfect accuracy (Burns, 1980). Perhaps more importantly, researchers discovered that the presence of more depressive symptoms were linked to a higher expectation of being in social situations, which subsequently led individuals to feel worse following the rejection (Caoutte & Guyer, 2016). Such distorted thinking could magnify the significant loss and be equally aversive for those who have recently become visually impaired.

As such, the goal of CBT is to assist individuals in shifting their cognitive style from depression- or anxiety-inducing thoughts to an approach that yields more accurate and adaptive appraisals of situations, mitigates symptoms, and promotes wellness (Clark & Beck, 2010).

In addition, CBT seems to also be effective with individuals living with similar experiences to those who have recently become visually impaired; namely those living with physical disabilities and chronic illness, which also result in marked functional impairment largely due to negative impact on QOL. In a study comparing a CBT-based intervention with treatment as usual for individuals with multiple sclerosis, the individuals receiving the CBT-based intervention were found to have significantly lower depressive symptoms than those who received the general supportive therapy (Mohr et al., 2000), suggesting that addressing maladaptive cognitions and enhancing problem-solving skills can reduce depressive symptoms in those with a debilitating chronic illness.

Studies specifically examining the role of distorted thinking for those living with psychological distress stemming from an impairment, such as a spinal cord injury, have been particularly insightful. In a large study of 174 participants with a spinal cord injury it was identified that catastrophizing, a negativistic form of jumping to conclusions (Burns, 1980), was significantly correlated with experiences of pain and disability (Turner, Jensen, Warms, & Cardenas, 2002). Another study demonstrated the effectiveness of CBT in reducing depression and increasing glycemic control in individuals living with Type 2 Diabetes Mellitus when compared to a group receiving no specific antidepressant treatment (Lustman, Griffith, Freedland, Kissel, & Clouse, 1999).

Recent years have seen an influx in research specifically focused on the prevalence and type of cognitive distortions endorsed by individuals. Despite cognitive distortions being central to CBT, to the writer's knowledge only four measures have been developed to specifically identify and measure distorted thinking in any quantifiable way; the Cognitive Distortions Scale (CDS) (Covin, Dozois, Ogniewicz, & Seeds, 2011), the Cognitive Distortions Questionnaire (CD-QUEST) (de Oliveria, 2015), the Cognitive Error Questionnaire- General Form (Lefebvre, 1981), and the Inventory of Cognitive Distortions (ICD) (Yurica, 2002).

While each of these measures represent admirable efforts to more accurately assess distorted cognitions, they are not without their limitations. For example, while the CDS (Covin et al., 2011) demonstrated sufficient reliability ($\alpha = .933$ CDS total, .871 interpersonal, and .874

personal achievement) and validity (BDI correlation coefficient of *r* = .158 to .338) (Ozdel, et al., 2014), the nature of the administration is not conducive to the current clinical sample; the measure is 20-items in length with each item comprised of the definition of a specific distortion and a one paragraph example, which is burdensome to a visually impaired population. The CD-QUEST (de Oliveria, 2015), originally developed in both Portuguese and English, has not been sufficiently validated. Only one validation study has been completed for the English version with a clinical sample (Kaplan et al., 2017) and it demonstrated insignificant correlation with self-reported measures of depression, suggesting possible construct validity issues. Lastly, the Cognitive Error Questionnaire-General Form (Lefebvre, 1981), derived relatively early on in the history of the Cognitive Model and focused originally on the interpretations of patients specifically with chronic pain, fails to account for new understanding and broadening applicability of the role of cognitive distortions. As such, this study utilized the ICD (Yurica, 2002) given the more unified definition of cognitive distortions it has incorporated, applicability to multiple psychological disorders, and the validation for use in a wide array of populations.

The ICD was developed utilizing a large sample size; 188 individuals from outpatient clinics and 66 individuals comprised the control group (Yurica, 2002). 11 total factors were retained following a factor analysis which included (1) magnification, (2) fortune-telling, (3) externalization of self-worth, (4) emotional reasoning, (5) perfectionism, (6) comparison with others, (7) emotional reasoning/decision making, (8) arbitrary inference, (9) minimization, (10) labeling, and (11) mind-reading (Yurica, 2002).

Important research in the development of the ICD (Yurica, 2002) was Rosenfield’s (2004) study which explored the relationship between the prevalence of cognitive distortions and meeting diagnostic criteria for a mental health disorder using the ICD (Yurica, 2002). Rosenfield obtained a positive correlation between the number and frequency of cognitive distortions the individual endorsed and the prevalence, as well as the severity, of clinical syndromes. Interestingly, this same relationship was found for most personality disorders in relation to cognitive distortions. This work is integral due to the fact it supports the usage of the ICD to predict the presence and severity of a variety of mental health disorders. Significantly, approximately half of the variance in severity number of disorders, both clinical syndromes and personality disorders, was accounted for by the number and frequency of cognitive distortions (Rosenfield, 2004).

Social Problem-Solving Model

An understanding of Social Problem-Solving Theory (SPST) is predicated on an understanding of four major concepts: problem, solution, problem-solving, and solution implementation (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). These terms help to provide a framework and context for discussion of PST in addition to providing a more comprehensive theoretical background of SPST.

A problem, sometimes referred to as a problematic situation, is defined as a situation or undertaking, either in the present or expected in the future, which requires a reaction to facilitate a favorable outcome, however, no readily apparent appropriate course of action may be available because of one or more barriers (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). The problem may have its origin in the environment or within an individual and barriers can range from conflicting sensory experiences, novelty, uncertainty about the future, or lack of necessary skills (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Additionally, problems may be interpersonal; the barrier may entail conflict between two or more people and goal is to seek a result that is optimally acceptable for all parties (D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

A solution is referred to as a response or pattern of responses, that can either be cognitive or behavioral, that is the result of the process of problem-solving which is applied to a specific challenging situation (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Solutions are deemed to be effective when the solution accomplishes a specific goal; the solution changes the environment in a positive way or there is a reduction in the experiences of emotional distress while, in addition, increasing the positive outcomes and reducing negative ones (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Solutions may look different depending on the immediacy of the problem, number of individuals involved, and whether consensus is required or simply preferred (D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

The term problem-solving is in reference to the implementation of skills necessary to finding adequate solutions to presenting challenges (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). These skills are generally assumed to be generic, and not necessarily related directly to a specific problem. Solution implementation, however, appropriately refers to an individual’s ability to successfully carry-out the identified solutions in relation to a specific problem; it is possible for an individual to be skilled at problem-solving and be poor at solution implementation or vice versa (D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

Additionally, SPST contends problem orientation and problem-solving style, the way in which an individual appraises problems and the way in which they have generally handled problems in the past, respectively, help to determine response. Problem orientation is divided into two separate categories; positive problem orientation and negative problem orientation (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). These approaches are largely based on emotional schemas which tend to relate to an individual’s general disposition and approach (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Positive problem orientation relates to an individual’s general attitude, specifically that problems are challenges meant to be overcome, that the problem has a solution, that the individual possesses the ability to solve that problem, that problem-solving takes time and effort, and the commitment to confronting challenges head-on as opposed to avoidance (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). The individual with the positive problem orientation believes problems are opportunities, remains optimistic the problem is solvable and they are capable of achieving that solution, are not discouraged by the time required to solve the problem, and are willing to commit themselves to the problem-solving process (D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

Conversely, the negative problem orientation assumes the opposite of the positive approach. Individuals with the negative problem orientation view problems as a risk to health and wellbeing, question their ability to handle the challenge, and have a tendency to become more frustrated when problems arise (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). In many ways, a person with a negative problem orientation has a pessimistic view of the problem, their ability to solve it, and becomes easily upset during the process.

Problem-solving styles are cognitive and behavioral strategies used to comprehend problems and find solutions; these styles are generally the way individuals approach problems in their lives (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Conceptualized another way, (D’Zurilla & Nezu, 1999, D’Zurilla, Nezu, & Maydeu-Olivares, 2002) propose three distinct types of problem-solving styles; rational, impulsive/careless, and avoidant.

Rational problem-solving is considered to be the most constructive of problem-solving styles as it incorporates the four major problem-solving skills most fully; problem definition, creation of alternate solutions, making decisions, and implementation of the identified solution and validation (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). This type of problem-solving style is deliberate, focused, and attuned to the outcome of the implementation of the solution which increases the likelihood that the solution actually solves the problem by measuring outcomes.

The impulsive-careless problem-solving style is considered to be a dysfunctional approach to solving problems because, while it does incorporate some of the aforementioned problem-solving skills, individuals often with this style make rushed decisions and fail to consider alternatives (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Individuals utilizing this problem-solving style tend to quickly and haphazardly think through alternate solutions without thoughtful consideration and tend to do the same as it relates to evaluating the outcomes.

The avoidant style is another problem-solving style considered to be dysfunctional as it is defined by delay or procrastination, lack of assertiveness, and reliance on others (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Individuals using this strategy tend to steer clear of direct confrontation with challenges, put off immediate action for as long as possible, and generally wait for issues to resolve themselves (D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

Taking altogether, SPST suggests constructive problem-solving is predicated on a considerate, thoughtful, and systematic use of the previously identified problem-solving skills (problem definition, creation of alternate solutions, making decisions, and implementation of the identified solution and validation), subsequently enhancing the likelihood of a positive outcome (D’Zurilla, Nezu, & Maydeu-Olivares, 2004). Conversely, SPST also contends the implementation of avoidant or impulsive-careless problem-solving style is more likely to lead to less favorable outcomes (D’Zurilla, Nezu, & Maydeu-Olivares, 2004).

Problem-Solving Therapy

Problem-Solving Therapy (PST) is a cognitive-behavioral approach to the treatment of psychological disorders like depression. First pioneered by D’Zurilla and Godfried (1971) as a way to enhance self-control and sustain behavioral change, PST has undergone continued revision over the years and has been validated for a number of diverse populations. PST, based on the afore discussed Social Problem-Solving Theory, is predicated on the belief that individuals suffering with depression lack the ability to adequately cope with life's stressors; patients are thought to lack the skills to manage adverse situations arising in their lives, with psychopathological symptoms manifesting as the consequence of poor coping strategies (D’Zurilla & Nezu, 2007). PST was developed not only to address chronic everyday problems, but also to assist individuals effectively manage traumatic and life changing events (Nezu, Nezu, & D’Zurilla, 2013).

The problem-solving model is able to address issues associated with visual impairment as PST considers how an individual appraises a stressful life situation and what coping strategies the individual subsequently engages in to manage the stressor. Problem-solving models encompass a much broader scope of coping strategies that not only address possible behavioral or environmental changes that can be implemented to ease a burden, but also incorporate more cognitive, emotion-focused strategies, which can be used to modify belief systems and emotional responses (D'Zurilla & Nezu, 2007).

As it stands to reason, when challenges are identified as modifiable, problem-focused interventions are emphasized and emotion-focused goals are considered secondary, unless emotional distress is high (D'Zurilla & Nezu, 2007). Conversely, when situations are perceived as largely unchangeable, such as when one is dealing with a death or a loss of vision, emotion-focused goals are targeted and can include items like acceptance of the loss and finding meaning and/or the proverbial silver lining (D'Zurilla & Nezu, 2007). Each type of goal, whether problem-focused or emotion-focused, has a role to play in regard to the natural sadness individuals experience when they lose vision.

Problem-focused goals and goal-attainment can reduce stress resulting from functional impairment. Ultimately, however, emotion-focused strategies often must be considered to enhance acceptance and cognitively reframe stressful life events. Crucial to addressing the losses faced by those who have lost their sight is to specifically identify the daily problems, outline the emotional responses to both daily life stress and major negative events, understand the approach to problem-solving, and uncover distortions resulting in dysphoria, ineffective implementation of coping strategies, and poor execution of solution focused strategies (D'Zurilla & Nezu, 2007).

PST has two primary stated goals; firstly, PST aims to assist individuals in adopting a more adaptive view of the world by enhancing acceptance, optimism, and self-empowerment. Secondly, a goal is assisting individuals in utilizing problem-solving behavioral strategies, such as emotional regulation and planful problem-solving (Nezu, Nezu, & D’Zurilla, 2013).

Since the 1980s, PST has been shown to be an efficacious and effective treatment for a variety of psychiatric and medical disorders. For example, researchers have demonstrated PST’s efficacy in both individual and group settings (D’Zurilla & Nezu, 2010) to effectively treat adjustment disorders, schizophrenia, anxiety disorders, suicidal ideation/behavior, substance use problems, as well as a multitude of medical diagnoses (D’Zurilla & Nezu, 2010). Given the breadth and scope of populations benefiting from PST, one singular standardized manual is not likely to be equally effective, though D’Zurilla and Nezu (2010) have identified 14 generic modules that are easily adaptable given the unique needs of the population being addressed.

The 14 training modules identified by D’Zurilla and Nezu (2010) were crafted with the express purpose of assisting an individual to develop a positive problem-solving orientation, decrease their negative orientation, enhance rational problem-solving skills, decrease avoidance regarding problem-solving, and reduce tendencies for individuals to act impulsively or careless.

According to D’Zurilla and Nezu, (2010), module one is the initial structuring phase in which it is important for providers to establish a trusting and positive rapport while also explaining the rationale for the treatment. The second module is considered the assessment portion of the treatment where an individual is assessed on their problem-solving strengths and weaknesses. Module three consists of discussion around obstacles to effective problem-solving and providers explain the pitfalls of multitasking. Module four is designed to foster self-efficacy and introduces the concept of positive problem-solving. The fifth module of PST focuses on an individual’s ability to recognize problems by helping individuals to become aware of the various emotions alerting them that something is not working well for them. The sixth PST module is designed to help clients cognitively restructure their thoughts regarding the problem and help them see it more as a challenge than an unsolvable problem; this module introduces skills training to enable challenging dysfunctional beliefs and assumptions. PST’s seventh module focuses on emotion; in this module, clients are further instructed about the role of emotion in problem-solving and how to recognize and utilize emotional cues. The eighth module suggested by PST is psychoeducation and practice with the stop and think technique; clients are taught how to recognize maladaptive thoughts and then how to use thought stopping and refocusing to allow for more accurate appraisals of the situation. The ninth module of PST suggested by D’Zurrila and Nezu (2010) includes clarification of the problem and helps the client better understand the nature of the issue; by doing so, the client is then able to set goals, then to generate creative alternatives (Module 10), make an effective decision based on possible consequences (Module 11), and subsequently implement the chosen decision (Module 12). Modules 13 and 14 include guided practice on effective decision making and refinement of skills (D’Zurilla & Nezu, 2010).

A recent meta-analysis of 21 independent studies concluded that PST was similarly as effective as other psychosocial therapies at reducing the symptoms associated with depression (Bell & D'Zurilla, 2009). Further analysis from the same study suggested PST was more effective when the treatment included explanations about positive problem-solving orientation, psychoeducation on problem-solving skills, and training in the complete problem-solving package (Bell & D'Zurilla, 2009).

According to Kiosses and Alexopoulos (2014), when PST is utilized to target depressive symptoms in older adults, the results are similar. Results have consistently demonstrated that PST leads to greater reductions in depressive symptoms across multiple studies when compared to supportive therapy or reminiscence therapy for this population. Benefits have been seen in stroke patients (Robinson, et al., 2008), individuals part of a home-care agency (Gellis, McGinty, Horowitz, Bruce & Misener, 2007), and individuals who were homebound (Choi et al., 2014). Because aging adults are faced with innumerable losses and other stressors in their everyday lives that include losses of loved ones, medical diagnoses, and disability; a step-by-step skills-based approach to addressing these difficulties is logical and pragmatic. It should be noted that older adults are the population demographic most likely to be affected by decreasing visual acuity. Additional findings from Kiosses and Alexopoulos' (2014) meta-analytic study suggest PST may be effective in other modalities as well. Studies reviewed showed promising results when PST was delivered through telephonic and internet-based methods (Downe-Wamboldt et al., 2007)

Measure of Problem-Solving for Visual Impairment. Given the unique experiences of those with vision loss, it is necessary to utilize a measure designed to assess the cognitive and behavioral adaptations individuals with vision loss employ. It is especially germane given the cognitive and behavioral components of the implemented treatment.

The measure chosen for this study was the Vision-Specific Optimization in Primary and Secondary Control Scale (VIS-OPS) (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013), which is based on Heckhausen, Wrosch, and Schulz's (2010) lifespan theory of control. This theory suggests trade-offs occur regarding primary (externally directed actions to accomplish goals) and secondary (internal thoughts and beliefs) control across the lifespan as individuals enter old age (Heckhausen & Shultz, 1995).

The VIS-OPS utilizes the lifespan theory of control to measure various primary and secondary control strategies as it relates to vision loss (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013) and incorporates reformulation of goals after losing vision, utilization of resources (i.e. white cane), and adapting to loss of valued activities. Given the theoretical underpinnings of this study, the VIS-OPS is an appropriate measure for assessing adjustment to visual impairment.

Treatment Methods for Depression in the Visually Impaired

As previously noted, it is encouraging that visual rehabilitation specialists have been advised to become more knowledgeable about the onset of depression, how to recognize it, and how to offer assistance. More importantly, when evidence of depression is discovered health professionals treat the depressed mood as a legitimate concern rather than being dismissed as a normal part of aging or disability (O'Donnell, 2005). Developing an evidenced-based treatment to mitigate the symptoms of depression in adults with acquired visual loss has been a challenge. However, given that experiencing stressful life events, such as deteriorating vision, can understandably result in depression (Hammen, 2005), it is imperative efficacious treatments are developed for this population. While it has been noted that adjustment to visual impairment, family support, and a positive attitude facilitate better outcomes and reduce instances of depression (Nyman, Dibb, Victor, & Gosney, 2012), relatively few approaches have emerged to directly address the onset of depressive symptoms and the need for those losing their vision to develop adaptive coping strategies.

Horowitz, Reinhardt, and Boerner (2005), conducted a longitudinal study assessing the effectiveness of counseling, use of visual rehabilitative services, use of skills training, and other adaptive devices on the reduction of depression in a visually impaired population. At two years follow up, they found that individuals receiving counseling services, in addition to low-vision clinical services, assessment of residual vision and optical prescription, and use of optical devices all contributed to the reduction of depressive symptoms. However, they also found skills training and use of adaptive devices alone did not contribute to lower levels of depression (Horowitz, Reinhardt, & Boerner, 2005). This suggests skill-based training may be a necessary, but insufficient alone to result in improvements in mood related symptoms and overall QOL.

Brody, Roch-Levecq, et al. (2002) also used a group treatment format for individuals living with AMD; the study divided participants into three groups wherein one group received in-person cognitive interventions, behavioral interventions, problem-solving, and guided practice (experimental group). The second group received an audio recording of health lectures relating to AMD (psychoeducation group); and the third group was a wait-list control. The experimental group also received psychoeducation regarding the onset of AMD in addition to strategies to maintain physical activity. The results reported statistically significant differences relating to increases in functioning, improved mood, less disability, and lower incidents of emotional distress in the experimental group who received the cognitive interventions, problem-solving, and behavioral techniques (Brody, Roch-Levecq, et al., 2002). This study supported a similar intervention with a smaller sample size (Brody, Williams, & Thomas et al., 1999), and further suggests group treatment is efficacious in improvement of mood and enhancing overall QOL for individuals with visual impairment.

Birk et al. (2004) demonstrated another efficacious group cognitive behavioral intervention for depression in a low vision population. Participants were individuals living with AMD in a hospital setting. This study consisted of three key treatment components, behavioral activation, CBT, and problem-solving therapy, and was able to produce statistically significant differences between groups on relevant measures of interest. Treatment consisted of six different modules over the course of a six-week period including relaxation strategies, discussion on how AMD has affected everyday life, the cognitive triad, behavioral activation, problem-solving, and information on accessing available professional resources. When compared to the control group, individuals receiving the six-session intervention showed an increase in positive affect, decreases in negative affect and depression, an increase in perceived autonomy, and more active problem-solving (Birk et al., 2004).

PST is an intervention that instructs individuals on how to navigate difficulties, encourages accurate appraisals of situations, and has the flexibility to be customized to fit the needs of a particular population: Adapted PST manuals have demonstrated efficacy in reducing emotional disorders resulting from the development of an illness or disability (Hegel & Areán, 2003).

Another example of a study using a variation of PST examined the outcomes of two groups, one of which received problem-solving therapy intervention while the other received treatment as usual. The results were encouraging in that the group receiving the problem-solving therapy reported statistically significant declines in experiences of depression at the end of the treatment and again at the three-month follow-up. The treatment group was also more likely to not give up a valued activity, and thus remained engaged in personally fulfilling activities (Rovner, Casten, Hegel, Leiby, & Tasman 2007). However, at the six-month follow-up, differences in the instances of depression between the experimental and control groups had diminished and the two groups were no longer statistically different when levels of depression were compared, indicating the treatment effect had worn off (Rovner, Casten, Hegel, Leiby, & Tasman, 2007). The initial success of this intervention suggests PST can assist individuals in managing symptoms of depression, however, there are contradictory findings on the duration of the reduction of depressive symptoms in a visually impaired population.

Chapter 3: Hypotheses

Research Question 1

Will an adapted group PST treatment reduce symptoms of depression for individuals living with visual impairment?

Hypothesis 1. It is hypothesized that PST will result in a significant reduction in depression for visually impaired adults, from pre- to post-test. Depression is operationalized by scores on the BDI-II (Beck, Steer, Ball, & Ranieri, 1996).

Research Question 2

Will the implemented PST group treatment reduce cognitive distortions, which correlate with psychological disorders?

Hypothesis 2. It is hypothesized there will be a decrease in the number and frequency of cognitive distortions endorsed by visually impaired adults among participants who attend the group treatment. Cognitive distortions will be operationalized as scores on the Inventory of Cognitive Distortions (ICD) (Yurica, 2002), from pre- to post-test.

Research Question 3

Will participants who attend the group treatment show improvements in problem-solving abilities and increase acceptance related to visual impairment?

Hypothesis 3. It is hypothesized there will be improvements in problem-solving ability and acceptance associated with decreased visual acuity. Problem-solving and acceptance will be operationally defined by scores on the Vision Specific Optimization in Primary and Secondary Control Scale (VIS-OPS) (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013) and the Acceptance and Action Questionnaire-II (AAQ-II) (Bond et al., 2011), respectively.

Research Question 4

Will individuals who attend the PST group treatment report increased perceived quality of life?

Hypothesis 4. It is hypothesized there will be improvements in perceived quality of life following the Problem-Solving treatment. Quality of life will be operationalized as scores on the World Health Organization Quality of Life-Brief (WHO-QOL BREF) (WHOQOL Group, 1993).

Chapter 4: Method

Study Design and Design Justification

This study employed mixed method design. A quantitative, experimental study using a pretest-posttest study design was utilized to assess the efficacy of a brief PST protocol for a group of individuals with low-vision and the aforementioned hypotheses were investigated. Later, a qualitative analysis analyzed relevant cognitive and behavioral factors in treatment and outcomes.

Participants

Participants volunteered for this study at a non-profit organization for the blind and visually impaired in a large Northeastern metropolitan city in the U.S. It should be noted that the impetus for the intervention occurred when administrators for the non-profit organization contacted the chair of the current study to request assistance for their members.

Inclusion Criteria. Individuals included in the study were those aged 18-80 years old, currently receiving services from the non-profit organization serving the visually impaired and had moderate or severe visual impairment. Individuals who were included in the study had a marked impairment in visual acuity, with onset during the past five years, according to participant's self-reported history and diagnosis. Individuals who had transitioned from sighted to low-vision as well as those whose eyesight has gone from low-vision to blind were eligible to participate in the study. Participants also endorsed mild, moderate, or severe symptoms of depression, as measured by the Beck Depression Inventory-II (BDI-II) (Beck, Steer, Ball, & Ranieri, 1996) or by subjective self-report of mild, moderate, or severe sadness related to vision loss. Participants were asked to rate feelings of sadness during the intake interview and those answering affirmatively were invited to participate. This latter, more subjective measure of depression, was included in recognition of possible response bias that may suppress reports of depression on more objective measures due to stigma and social desirability. Response bias has been found to occur when thrid-party transcribers interview visually impaired individuals, as was the case in this study (Tolman, Hill, Kleinschmidt & Gregg, 2005).

Exclusion Criteria. As assessed during the initial intake interview, individuals currently receiving individual outpatient psychotherapy were excluded from the study. Additionally, individuals who were visually impaired for longer than five years or did not have a marked deterioration in vision during the last five years were also excluded from participation in the study. Individuals who endorsed current substance dependence, psychosis, dementia, neurodegenerative diseases (i.e. Parkinson’s or Alzheimer’s), or suicidal ideation were also excluded from the study but were provided an appropriate referral. Individuals actively participating in an outside job or skills training program were also excluded from participation in the study to reduce external confounding variables that could influence dependent variables.

Measures

World Health Organization-Quality of Life Brief (WHOQOL-BREF). The WHOQOL-BREF is a 26-item measure assessing various domains pertaining to an individual’s quality of life and include psychological health, physical health, environmental factors, and social relationships. Each domain contains six questions with two additional questions that assess overall satisfaction with general health. The WHOQOL-BREF demonstrated acceptable internal consistency measured by Cronbach’s α in all domains; physical health 0.82, psychological 0.81, environment 0.80, and social relationships 0.68. Discriminant validity and construct validity were also found to be acceptable (Skvington, Loftfy, & O’Connell, 2004).

The WHOQOL-BREF (WHOQOL Group, 1993) provides scores denoting an overall quality of life profile as well as scores on the aforementioned domains of physical, psychological, environmental, and social relationship health. Each item is scored on a 1-5 Likert scale where 5 represents very satisfied, very often, or very completely while scores of 1 denote very dissatisfied, never, and not at all. Three items on the measure are reversed scored so that higher scores suggest higher quality of life. Scores from each question are summed to achieve a raw score. Raw scores are then converted to transformed scores on a 0-100 scale where transformed scores of 100 represent complete satisfaction and scores of zero suggest complete dissatisfaction (WHOQOL Group, 1993).

Inventory of Cognitive Distortions. The Inventory of Cognitive Distortions (ICD) is a 69-item measure that identifies 11 different types of cognitive distortions. The ICD identifies the cognitive distortions of discounting the positive, magnification, fortune-telling, externalization of self-worth, perfectionism, absolutistic or dichotomous thinking, emotional reasoning, minimization, should statements, and catastrophizing. The ICD was found to have high internal consistency (.98) as well as appropriate concurrent validity. The ICD is correlated with the Dysfunctional Attitude Scale (DAS) ($r = .70$) as well as with the Beck Depression Inventory (BDI) ($r = .70$) (Yurica, 2002). It is hypothesized the presence of cognitive distortions may exacerbate underlying psychological sequelae.

The ICD contains short statements relating to the 11 identified cognitive distortions and asks individuals completing the measure to rate these items on a five-point Likert scale where 1 = “Never,” and 5 = “Always.” Scores on the ICD can range from 69 to 345 where higher scores denote the presence of more cognitive distortions. In addition to the total score, subscale scores are available for each distortion (Yurica, 2002).

The Vision Specific Optimization in Primary and Secondary Control. The Vision Specific Optimization in Primary and Secondary Control (VIS-OPS) is a 23-item measure designed to assess psychological and behavioral adaptations of individuals with low-vision (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013). The VIS-OPS identifies four categories of psychological and behavioral adaption that includes Selective Primary Control (SPC), Compensatory Primary Control (CPC), Selective Secondary Control (SSC), and Compensatory Secondary Control (CSC). Additionally, the measure identifies specific strategy types related to coping with visual impairment, which include, but is not limited to, investing time, investing effort, use technical aids, and employing new/unusual means. Individuals are asked to respond to items on a four-point Likert scale where 1 is Not at All, 2 is Only Occasionally, 3 is Some of the Time, and 4 is All of the Time.

Scores on the SPC category range from 6 to 24, where higher scores denote more utilization of strategies such as investing effort, investing time, and fighting difficulties. Strategies in this domain are related to an individual’s willingness to devote self-contained resources like determination and allocation of time to acquire a skill (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013).

Scores on the CPC category range from 7 to 28, where higher scores denote more utilization of strategies such as enlisting the help of others, accepting the help of others, utilization of aids, and devising novel means of addressing low vision. This domain focuses on how external resources are implemented to manage difficulties associated with low visual acuity (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013).

Scores on the SSC category ranges from 6 to 24, where higher scores denote more utilization of strategies such as enhancing goal value, anticipation of positive outcomes, and utilizing emotional supports from others. This domain focuses on an individual's ability to use cognitive strategies to maintain resilience despite the hardships that accompany decreasing vision (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013).

Scores on the CSC category range from 4 to 16, where higher scores denote more implementation of downward social comparisons, selective intra-individual comparisons, and disengagement from unattainable goals. This domain focuses on self-protective inter- and intra-personal comparisons, assessing individuals on their ability to see their vision loss as less serious than problems others face or reminding themselves they can still do many things despite vision loss (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013). Cronbach's alpha was found to be acceptable for each of the domains; SPC = .61, CPC = .72, SSC = .72, and CSC = .70. Additionally, the VIS-OPS domains were found to be correlated with other measures of disability (Brennan-Ing, Boerner, Horowitz, & Reinhardt, 2013).

Acceptance and Action Questionnaire-II. The AAQ-II is single-factor 7-item measure designed to assess experiential avoidance and psychological flexibility. Participants rate each statement on a 7-point Likert scale where 1=Never True and 7=Always True. Scores range from 7 to 49, where higher scores denote more psychological inflexibility whereas lower scores suggest more acceptance (Bond et al., 2011).

The validation research was conducted across six studies comprised of 2,816 individuals and was found to have sufficient concurrent, convergent, and discriminate validity in addition to possessing sound reliability outcomes (Bond et al., 2011). In regards to validity, the AAQ-II was found to be correlated with measures of depression (Beck Depression Inventory-II, r = .71 and Depression and Anxiety Stress Scale (DASS)-Depression, r = .61), measures of anxiety (Beck Anxiety Inventory, r = .58 and DASS-Anxiety, r = .51), stress (DASS-Stress, r = .54), general health (General Health Questionnaire-12, *r* = .30 and Global Severity Index of Symptom Checklist-90-Revised, *r* = .65), and suppression of thoughts (White Bear Suppression Inventory, *r* = .60). Cronbach's alpha was ascertained to be .84 while test-retest reliability was calculated to .79 after one year (Bond et al., 2011).

Beck Depression Inventory, Second Edition. The BDI-II is a 21-item self-report measure of the symptoms and severity of depression (Beck, Steer, Ball, & Ranieri, 1996). Responses on items range from 0 to 3 and are summed to create an overall score of depression ranging from 0 to 63.). Scores are stratified into four different severity classification categories dependent on total score; minimal depression (0-13), mild (14-19), moderate (20-28), or severe (29-63). The BDI-II has sound psychometric properties with high internal consistency (Cronbach's alpha = .91) and test-retest reliability (*r* = .93; Beck, Steer, Ball, & Ranieri, 1996). The BDI-II has adequate discriminant validity, demonstrating a mild correlation coefficient (*r* = .41) with a measure of anxiety; the Hamilton Anxiety Rating Scale-Revised (HAM-A; Hamilton, 1959).

Procedure

Administrators from the participating organization serving the blind and visually impaired originally contacted the dissertation chair to request assistance for individuals who were distressed because they had recently lost their sight. Upon IRB approval, the organization was contacted and provided with a recruitment script. The organization was instructed to have the script read aloud during the support groups already occurring to assess for participant interest in the study. The text of the disseminated script provided potential participants information regarding the nature of the study and the roles and responsibilities of both the Philadelphia College of Osteopathic Medicine and the cooperating organization.

Individuals currently participating in programming at this non-profit were notified with a standardized announcement during already existing groups of the opportunity to participate in a study designed to help alleviate depression and anxiety. Individuals who expressed interest were subsequently called by the responsible investigator (RI) and read the informed consent, given an outline of the treatment, the scheduled dates of the group, provided answers to questions, and were scheduled for an intake with the research assistant (RA), a doctoral student from PCOM who was trained and supervised by the RI and primary investigator, respectively. During the initial call, the participant was provided a unique four-character code so that data could be de-dentified. The master list of participant names and unique codes were stored by the RI on a password protected computer, encrypted, and kept separate from study data.

The RA completed a semi-structured interview with each individual participant 7-14 days before the beginning of the group treatment to gather background information, screen for exclusionary criteria, and complete the following pre-test measures; BDI-II, AAQ-II, WHO-QOL BREF, ICD, and VIS-OPS.

Upon completion of all pretest requirements, individuals began attending weekly Group Problem-solving Therapy (six sessions of two-hours each) administered by the RI, a doctoral student, under the supervision from the PI, a licensed psychologist. The sessions were video recorded and reviewed by the PI to ensure treatment fidelity and to provide supervision to the RI.

Each session was transcribed to assess for themes and to uncover salient cognitions related to depression, acceptance, and quality of life issues. Due to limitations in available participants, no control group was utilized. However, the study design allowed for baseline data to be used as a control. The PST manual was adapted with permission from *Problem-Solving Therapy; A*

Treatment Manual (Nezu, Nezu, & D’Zurilla, 2013) to make strategies tailored to individuals living with low-vision or blindness.

The adapted PST manual contained six-two-hour sessions that were delivered once per-week over a six-week period. The first session served as an introductory session, which was used to acclimate participants to the group treatment, establish group norms, as well as allow for a comprehensive rationale of PST to be delivered. Additionally, participants were educated on the different problem style orientations and problem-solving styles and brief vignettes were used to assess the group’s understanding. The vignettes utilized to demonstrate problem-style orientation and problem-solving styles were examples of common challenges for the low-vision community and included relying on public transportation, difficulties ordering food in a crowded convenience store, and living on a fixed income.

The second session instructed group participants on Toolkit #1, Overcoming Cognitive Overload, and imparted skills of externalization, visualization, and simplification to enhance problem-solving skill (Nezu, Nezu, & D’Zurilla, 2013). Participants were encouraged to share various techniques and technologies that can be utilized to implement these three strategies. Adaptation to the externalization strategy was made to account for difficulties in taking notes or using a whiteboard to address a problem. Instead, participants were encouraged to utilize recordings on their phones, voice activated reminders, and other available notation software to reduce cognitive overload.

The third session educated group participants on Toolkit #2, the Stop, Slow Down, Think, and Act (SSTA) method for overcoming emotional dysregulation (Nezu, Nezu, & D’Zurilla, 2013). Given this strategy hinges on the regulation of emotions, minimal adaptation was required. However, participants benefited from relevant situational examples of how this technique could be implemented. Subsequently, participants shared various situations in which they believed this technique may be helpful for them in the future, thereby reinforcing the content of the session.

The fourth session focused on Toolkit #3, Healthy Thinking and Overcoming Hopelessness, which instructed participants on how to identify and address maladaptive thinking while also using thinking skills to overcome feelings of hopelessness (Nezu, Nezu, & D'Zurilla, 2013). Group participants completed an ABC thought record and were provided with short and simple questions to challenge maladaptive thinking. Given participants were unable to view a handout thoroughly explaining an ABC thought record, visualization techniques and descriptive language was used to help participants imagine the three columns and corresponding prompts. Participants were also given time to practice the thought challenging questions to reinforce learning and encouraged to use their phones to take voice notes to help them accomplish this task during the homework assignment.

The fifth group educated participants on Toolkit #4, Planful Problem-Solving, which brought all previously instructed skills together to help participants develop a comprehensive strategy to solve challenges (Nezu, Nezu, and D'Zurilla, 2013). Participants of the group worked collaboratively to create immediate solutions, mid-term solutions, and long-term solutions to issues related to transportation and related visual impairment difficulties.

The sixth and final session included a recap of all the discussed toolkits and provided an opportunity for cognitive rehearsal and an opportunity for participants to express beneficial areas of the group as well as areas of possible improvement.

Throughout the course of treatment, study participants were asked to complete the BDI-II (Beck, Steer, Ball, & Ranieri, 1996) with the RA transcribing, before session number two, session number four, and session number six to identify progress in treatment and to assess for possible worsening depression or the development of suicidality. Due to vision loss, individuals were read the BDI-II (Beck, Steer, Ball, & Ranieri, 1996) by one of the RAs in a private room prior to each of the aforementioned groups.

After the last session of the PST treatment, study participants were called by the RA and were scheduled for a time to meet at the treatment location where post-test data was collected on all measures; BDI-II, AAQ-II, WHO-QOL BREF, ICD, and VIS-OPS. Due to time and scheduling restraints, interviews were conducted between one and three weeks following the completion of the treatment.

Individuals were then contacted three months after the termination of treatment to schedule a follow up assessment meeting where three-month follow-up data was collected on all measures; BDI-II, AAQ-II, WHO-QOL BREF, ICD, and VIS-OPS. This three-month follow-up data collection allowed for the researchers to assess for the durability of any changes found during the two previous data sets.

Chapter 5: Results

In an effort to understand both subjective and objective experiences of group participants, both qualitative and quantitative methods were used in addition to descriptive analyses. Utilizing a mixed-method design allowed for deeper understanding of the population. The qualitative methodology sought to augment the limited amount of quantitative data, which was limited by sample size. Additionally, the qualitative analysis allowed participants to reveal cognitions and emotional experience not otherwise readily discernible through survey-driven statistics.

Demographic Analysis

A total of 10 subjects were selected to participate in the study and completed the initial interview. Participants ranged in age from 29-70, with a mean age of 53. The sample had eight females (80%) and two males (20%). Most identified as African American (N = 6) (60%), followed by Caucasian (N= 3) (30%), and then non-white Hispanic (N = 1) (10%). Of the original 10 participants, eight (80%) completed the assessment shortly after the final session, and six (60%) completed the three-month follow-up (See Table 1). While all participants in the group experienced a decline in vision over the past five years, two group participants (20%) reported childhood onset of vision related difficulties, with their vision worsening over the last five years. Half of the group participants (50%) attended five or more sessions with 30% attending two or fewer sessions. The average number of sessions attended was 4.2. Reasons for inconsistent attendance are reviewed in the discussion section.

Table 1

Demographic Characteristics of Participants (N = 10)

Variable	n	%
Gender		

Male	2	20%
Female	8	80%
Ethnicity		
African American	6	60%
Caucasian	3	30%
Hispanic	1	10%
Age		
18-29	1	10%
30-39	0	*
40-49	4	40%
50-59	1	10%
60 and older	4	40%
Sessions Attended		
1	1	10%
2	2	20%
3	0	*
4	2	20%
5	1	10%
6	4	40%

Quantitative Results

To best show change over time and account for individuals who did not participate in all phases of post-treatment data collection, the net change was calculated from each measure by comparing the pre-test score to either the immediate post-treatment score or the three-month follow-up, if available. For individuals completing the three-month post-treatment assessment, this final score was used to generate the net change score. If the individual did not complete the three-month follow-up, the net change number was calculated using the immediate post-treatment score. For individuals who dropped out after completing the pre-treatment assessment, no net change score could be calculated and was therefore left blank, denoted by an asterisk. To give a fuller picture of individual participation, the number of sessions attended by each group member is in parenthesis.

First, it was hypothesized that PST would result in a significant reduction in depression for visually impaired adults when scores from the pre-treatment assessment were compared with post-treatment measures. Depression was operationalized by scores on the BDI-II. Of the individuals who completed only the post-treatment or the post-treatment and the three-month follow-up assessments, five individuals saw a net reduction in depression scores, while three individuals reported increased depressive symptoms. Of the individuals who reported higher depression scores, one individual attended two group treatments sessions. The other two individuals who reported higher depression scores attended five and six sessions respectively (See table 2).

Table 2

Depression: BDI-II Scores

Participant	Pre-Treatment	Post-Treatment	Three Month Follow-Up	Net Change
1 (6)	2	0	0	-2
2 (6)	0	3	9	+9
3 (1)	7	6	0	-7
4 (2)	6	13	*	+7
5 (4)	27	8	*	-19
6 (4)	5	6	9	+4
7 (6)	5	0	3	-2
8 (2)	34	*	*	*
9 (5)	0	*	*	*
10 (6)	5	0	0	-5

Note. Parenthesis denote number of sessions attended.

Second, it was hypothesized there would be a decrease in the number and frequency of cognitive distortions endorsed by individuals attending group PST. Cognitive Distortions were operationally defined by scores on the ICD (Yurica, 2002). Of the eight individuals whom post-test data was collected, seven of the participants reported a decrease in the number and frequency of cognitive distortions (See table 3).

Table 3

Cognitive Distortions: ICD Scores

Participant	Pre-Treatment	Post-Treatment	Three Month Follow-Up	Net Change
1 (6)	78	72	69	-9
2 (6)	150	175	168	+38
3 (1)	139	193	69	-70
4 (2)	167	141	*	-26
5 (4)	146	129	*	-17
6 (4)	166	147	147	-19
7 (6)	121	115	111	-10
8 (2)	179	*	*	*
9 (5)	119	*	*	*
10 (6)	131	117	106	-25

Note. Parenthesis denote number of sessions attended. Higher scores denote more cognitive distortions.

Third, it was hypothesized there would be improvements in problem-solving ability, coping, and acceptance for individuals completing the group PST. Acceptance was operationally defined as scores on the AAQ-II where lower scores denote more willingness and ability to tolerate intense or distressing thoughts, feelings, and memories. Improvement in problem-solving was operationally defined as scores on the VIS-OPS, where higher scores denote more vision specific problem-solving abilities.

In regards to scores on the AAQ-II, four individuals saw an increase in scores, denoting less acceptance than when they began the treatment. Conversely, four individuals reported lower or the same scores, suggesting more or equal levels of acceptance following the treatment.

When examining scores on the VIS-OPS, four of the participants reported a decrease or no change on all domains of the VIS-OPS. Two of the participants reported an increase in problem-solving abilities denoted by higher scores in all domains on the post-test measures. One participant noted no change from pre-test through the three-month follow-up. One participant reported decreases on three domains, with improvement in one domain. Further analyses of these scores is provided in the discussion section.

Table 4

Acceptance: AAQ-II Scores

Participant	Pre-Treatment	Post-Treatment	Three Month Follow-Up	Net Change
1 (6)	7	7	7	0
2 (6)	25	19	27	+2
3 (1)	19	21	7	-12
4 (2)	17	11	*	-6
5 (4)	18	19	*	+1
6 (4)	16	8	16	0
7 (6)	7	8	9	+2
8 (2)	31	*	*	*
9 (5)	7	*	*	*
10 (6)	13	13	16	+3

Note. Parenthesis denote number of sessions attended. Higher scores suggest lower levels of acceptance.

Table 5

Visual Impairment Problem-Solving: VIS-OPS

	Pre-Treatment				Post-Treatment				Three Month Follow-Up				Net Change			
Participant	SPC	CPC	SSC	CSC	SPC	CPC	SSC	CSC	SPC	CPC	SSC	CSC	SPC	CPC	SSC	CSC
1 (6)	24	28	24	16	24	28	24	16	24	28	24	16	0	0	0	0
2 (6)	23	28	19	12	24	28	24	14	13	20	12	8	-10	-8	-7	-4
3 (1)	18	27	19	10	17	27	26	9	6	7	6	4	-9	-20	-13	-6
4 (2)	23	19	22	9	24	27	24	13	*	*	*	*	+1	+6	+2	+4
5 (4)	24	26	22	14	21	20	18	15	*	*	*	*	-3	-6	-4	+1
6 (4)	23	27	23	14	20	28	24	14	22	23	23	8	-1	-4	0	-6
7 (6)	23	28	22	15	20	28	12	7	23	25	20	14	0	-3	-2	-1

8 (2)	16	17	16	10	*	*	*	*	*	*	*	*	*	*	*	*
9 (5)	22	25	14	9	*	*	*	*	*	*	*	*	*	*	*	*
10 (6)	24	22	20	10	24	28	17	20	24	27	22	16	0	+5	+2	+6

Note. Parenthesis denote number of sessions attended. This measures four domains of adaptation to visual impairment; it measures Selective Primary Control (SPC), Compensatory Primary Control (CPC), Selective Secondary Control (SSC), and Compensatory Secondary Control (CSC).

Finally, it was hypothesized individuals would report improvements in perceived quality of life following the group problem-solving treatment. Quality of life was operationalized as scores on the World Health Organization Quality of Life-Brief (WHOL-QOL-BREF) (WHOQOL Group, 1993). Higher scores on the WHO-QOL-BREF denote more satisfaction with the domains of physical health (D1), psychological health (D2), social relationships (D3), and environmental factors contributing to overall wellness (D4).

Three of eight individuals reported increases in quality of physical health when scores from pre-test were compared with scores from the post-treatment or three-month follow-up. Seven out of eight individuals reported higher scores on the psychological wellness domain. Six out of eight individuals reported increases in the quality of social relationships while one person registered no change. Three of eight participants reported an increase on environmental factors contributing to health, while two reported decreases in this domain. One individual reported no change in the environmental factors domain.

Table 6

Quality of Life: WHO-QOL BREF

	Pre-Treatment				Post-Treatment				Three Month Follow-Up				Net Change			
Participant	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4
1 (6)	28	25	15	36	29	27	15	34	29	27	15	36	+1	+2	0	-2
2 (6)	25	19	9	24	25	20	10	28	27	23	13	29	+2	+4	+4	+5
3 (1)	29	20	11	28	24	18	14	29	26	11	7	18	-3	-9	-4	-10
4 (2)	27	23	12	31	22	27	14	31	*	*	*	*	-5	+4	+2	0
5 (4)	22	23	7	28	18	25	8	32	*	*	*	*	-4	+2	+1	+4
6 (4)	27	25	13	33	30	27	14	35	26	27	15	30	-1	+2	+2	-3
7 (6)	18	24	8	28	19	21	8	22	24	25	9	28	+6	+1	+1	0
8 (2)	19	17	8	16	*	*	*	*	*	*	*	*	*	*	*	*
9 (5)	26	24	11	32	*	*	*	*	*	*	*	*	*	*	*	*
10 (6)	37	20	10	30	31	24	12	30	31	23	12	33	-6	+3	+2	+3

D1	Physical Health	D3	Social Relationships
D2	Psychological	D4	Environment

Note. Parenthesis denote number of sessions attended.

Qualitative Analysis

In addition to the quantitative data, qualitative data were collected throughout the PST group intervention by recording and transcribing each of the six sessions in detail. This was done in order to document and better understand the cognitions and experience of those living with visual impairment, the effect of sight loss on functioning, and the therapeutic benefit of the intervention. Through a comprehensive analysis of the transcriptions, four primary themes emerged which included underlying cognitions, social comparisons, emotional responses, and the impressions of the group treatment itself.

Underlying Cognitions. Given the theoretical underpinnings of this study are based on the Cognitive Model, special attention was paid to issues of maladaptive cognitive processes. During the six sessions, participants remarked on underlying perceptions of self and others, thoughts, beliefs, and interpretations of various challenging situations relating to transitioning to blindness, interacting with sighted individuals, and related to visual impairment.

When discussing self-perceptions, or the way individuals with visual impairment view themselves in the context of society, a number of clinically relevant cognitions emerged in many of the group members that seemed to indicate core beliefs of defectiveness and worthlessness. For example, one individual remarked during a session, “I am always on the verge of making a mistake,” while another followed with, “it’s like I screwed up or something.” A follow-up conversation relating to thoughts of making mistakes resulted in a participant stating, “[It’s] because people don’t see us as whole people anymore. They see us as crippled and damaged.” One particularly poignant comment came when an individual was discussing the interaction she had with her family:

> I am perceived as not having a purpose when I am with my whole extended family that are sighted, the feeling of not having a purpose to your family is very painful, you sit there like, you feel like a charity for them, and yet you don’t feel, you’re not seen as being able to contribute. I would love to contribute.

In addition to defectiveness, beliefs about helplessness and decreased abilities emerged. Individuals discussed the experience of losing sight and some of the associated difficulties with adjustment to being blind or having low-vision. Some participants remarked on the frustrations of losing sight and trying to stay organized stating, “I have the list, but I can’t see the list! And the list used to be my memory.” On learning new things as someone with visual impairment a group member stated, “you feel like a freak in the circus, I didn’t have the blindness skills to make me feel like I could master things. So, you know, a lot of those experiences reinforce some feelings of inadequacy.” One individual commented on the frustration of steadily declining vision and the challenges associated with mastering new skills:

> Sometimes when you’re visually impaired you’re not stable, your vision is changing. There’s an issue with feeling that you’re not able to master things, like you’re not able to do things like you used to do so simply, and then you’re learning new ways of doing things, and it takes you a little time to learn, it’s a learning curve for a lot of things. You want it immediately, you want to feel, you want to have a feeling of success, a feeling of mastery. And when you don’t have it, it doesn’t feed you right away. It’s so frustrating! You know, you start attacking yourself saying, “[…] I am such an idiot, I am a dummy, I’ll never do this.”

Social Comparison. Group participants also shared their experiences of interacting with sighted individuals and identified a number of significant beliefs germane to treatment. One group member shared, “being the in the room with sighted people, sometimes we feel inadequate because we’re not on par with the people who are around us and we judge ourselves too harshly or too critical sometimes," and followed that statement with, "we get intimidated and that makes us think, well some of us have this self-talk, thinking bad things about ourselves like, 'oh, you know you're dumb, or you're not smart enough, or you know you shouldn't have come here,' those types of things". Another group member went on to further elaborate some thoughts related to interactions with sighted people:

> I am hearing other people and I tend to get triggered by a habitual feeling of, well the action I get into is comparing, whether I sound as articulate, whether someone else sounds like I have the same facility in expressing themselves and I start to attack myself for saying, I can't compete I don't compare and so it makes me feel more self-attacking.

Many statements from group participants indicate a tendency to engage in upward social comparison, resulting in sadness and reinforcing the core beliefs of helplessness and worthlessness. They also revealed a tendency to conceal negative emotions associated with low-vision and blindness. Multiple group members commented that they prefer to not disclose how challenging acclimating to visual impairment has been. During one session, a group member stated, "It's hard for me to tell people what's wrong. It's easier… for me to tell people I am ok. I'd rather try to deal with the situation myself than bringing them into it."

Another group member expressed concern and ambivalence about how to handle a pedestrian's offer of help saying, "That's one of the issues that bothers me a lot, because I don't like to have people offer to help me and say no because I don't want to have them not offer, and if I am on the street they won't remember who I am, but I am concerned I might prevent that person from asking someone who really needs help." A different member of the group discussed the propensity to avoid discussions related to the emotional aspects of vision loss and feelings of sadness when in a group of other visually impaired people:

> "And the road ahead may not be that pretty, but this helps you to address some of the things you really don't want to address. Because, if you ask me, I'll tell you I am not sad. I don't get depressed. I'll tell you I don't have any of those issues, but I am human and losing my vision is not fun. When I first came I couldn't stand it, I couldn't stand all these blind people around me, it was just too hurting."

Emotional Responses and Related Cognitions and Loss of Abilities. Throughout the six-sessions, group participants expressed a number of relevant and important emotional responses to issues related to visual impairment. Many of the sentiments expressed regarding emotion came in the context of discussing feelings of emotional overload, which entailed the strategies of externalization, visualization, and simplification (Nezu, Nezu, & D'Zurilla, 2013). Many individuals describe intense emotional responses to situations in which they feel overwhelmed, misunderstood, or their vision loss has contributed to a hardship. One group member stated:

> I think when I forget to do things, or you know, the whole having it all clogged up in your brain, that's when I get emotional. Because I start getting like, 'If I could see, I would have wrote [sic] it down, I would have remembered,' so it kind of, when I don't have the reminders or, I know it's human to forget, but it still makes me feel like before I

> lost my vision I did not forget things. I was always on top of things. So, forgetting things gets me into an emotional state...

Still other members remarked on the spotlight effect and the feeling of being an outsider saying, "It feels like you're in a fishbowl a lot of times when you can't see. People are seeing you, and you're swimming around doing your thing, and people stay 'oh, stop!' or, 'no no no,' instead of allowing you the opportunity to learn yourself." One discussed the emotions associated with losing friends as a result of losing vision and thoughts of being an outcast, "You feel, isolated. That's the word. Isolated when people, uh, drop off when you turn visually impaired or blind. You feel so isolated." Another group member followed up with commentary with similar themes saying, "it's not a particular situation, just a general kind of feeling of feeling infantilized. Or somehow feeling that I am the freak in the circus amongst my family here." Whereas yet another stated, "I went to a fish fry with another aunt, and she was like, 'I am going to step outside to smoke,' but then before she went, she said, 'Oh, I got to find someone to watch you," which could easily be interpreted as evidence that others perceive the individual to be helpless and does, indeed, need competent supervision.

Discussions about emotions associated with visual impairment uncovered many beliefs related to coming to terms with the loss of vision. One member of the group lamented the loss of a previous skill of being able to manage finances remarking, "I get emotional about stuff like that because when I had sight, I was so organized, so organized. I had a book that said bills and it would say April, 2005 and then you know each month had a sheet, everything was written down." When the concept of blind aides, such as scanners and smart-phone application was brought up, one group member responded with:

> It is very difficult and it’s frustrating, talking about emotions, it’s frustrating. Everything plus, Ms. T., for scanning and all that there’s another aspect to it. Yes, we can do those things but they take infinitely longer. So, just the amount of time that it takes to do things, you just want to throw your hands up in frustration.

Further commentary on some of the negative emotions revealed obstacles to implementation of blind aides and illuminated the way for various clinical interventions, for example, learning how to use a smart phone as a memory device. One group member stated:

> I cannot read. I can’t see good enough to read, even with my glasses and a magnifier, I still can’t read, even when I write it big, so I go to look at it, and that’s my memory. You know, writing it down was my memory and I don’t know anything about Siri and so I can’t figure that out. I do have a smart phone but, you know, *the phone might be smart,* but unfortunately... [I'm not.]

Individuals attending the PST group were also forthcoming about the relationships and interactions they have with sighted individuals. Participants shared experiences they have had with pedestrians as well as physicians, oftentimes remarking on the favorable aspects of these relationships while also offering some constructive critiques. A member reported when an individual offers help, “I will sometimes say, sure because they nice enough to want to help me, so I will take their assistance. Because sometimes I think too if I don’t accept the help now, next time they’re just going to walk on by.” Additionally, members of the group discussed interactions with healthcare providers and not feeling understood. One group participant stated, “I go to doctor’s offices and my doctors are really great, but it’s, I have to tell them all, I don’t see well, I carry a cane to make sure they understand that and yet they’ll hand me a piece of paper and say, “Well here are the results of your test,” and then point to things.” On the availability of resources for visually impaired and blind individuals one member said, “Your internist or your family doctor has very little knowledge of resources available, I mean it would have been very helpful for me to know that, because I floundered, it was just hit or miss to try to locate resources that could help me.”

Participants' Thoughts on PST/Group Treatment. Throughout the group, members reflected on the usefulness of the PST skills, the helpfulness of the group dynamic, and remarked on how similar groups may be useful in the future. One member summarized their experience in the group by saying:

> Sometimes you don’t know you need something until you experience it and that is what I found out from being here. At first, I had my hesitations about certain things because we already have our preconceived concept of you know what it’s going to be. [The facilitator] was nothing like I thought, I thought he was going to sit here and rattle off some stuff to me and my world would just be better.

Members also remarked on implementation of various strategies stating, “For me it is useful because it is encouraging. When I look at this huge problem, I start getting anxiety, but once you break it down and as you accomplish each piece, you feel good about yourself.”

Another member reported, “I do find the mindfulness exercise really good, it was very, very helpful, so I think I benefited from everything that has been introduced in the class,” and even followed up with a comment about the continuation of similar groups saying, “I hope that it becomes part of the curriculum here.” Another member expounded on this idea stating, “This should be a staple at [the facility] I think, for an ongoing offering like a six-week module.”

While members generally found the six-week group to be useful and immediately applicable, one commented, “I was thinking that at the end of the six-weeks, it’s really just the beginning of learning this stuff,” while another followed with a statement referring to cognitive restructuring, “I think out of everything that we learned so far, this is the most difficult.”

Chapter 6: Discussion

It was hypothesized that PST would result in a significant reduction in depression for visually impaired adults. Depression was operationalized by scores on the BDI-II from pre- to post-test. Five of eight participants reported decreases in depression scores while three participants had depression scores increase. The median net change for those who saw a decrease was 5 points on the BDI-II from baseline.

Despite the increases in scores for three participants, all post-test scores were within the minimal range (<13). Increases in depression scores were minimal; participants who reported higher posttest scores logged a four-point, a seven-point, and a nine-point increases. These increases may have been observed for multiple reasons including extenuating life stressors, increased physical health problems or somatic concerns, or natural experiences of sadness on a given day. That said, the scores for all participants following treatment and at three-month follow-up did not exceed more than a minimal severity range; these results are encouraging and slight increases in BDI-II scores are not considered to be clinically significant.

While all participants in the group verbally endorsed symptoms of sadness, depression, and frustration, it should be noted only two participants endorsed symptoms of depression in excess of the minimal range at the initial pre-treatment interview on the BDI-II. Participant number five and eight reported scores of 27 and 34 respectively. Participant five, who attended four of six sessions, registered a drop of 19 points. Participant eight attended two sessions and declined to participate in posttest data gathering due to scheduling conflicts. Though a small sample, this may suggest those who may benefit the most from treatment are least likely to receive it, however, if those in need attend sessions, improvements can be achieved.

It was also hypothesized there would be a decrease in the number and frequency of cognitive distortions endorsed by visually impaired adults. Cognitive distortions were operationalized as scores on the ICD, from pre- to post-test. Seven of eight participants reported decreases in presence of cognitive distortions. The median ICD decrease for those who reported reductions in cognitive distortions was 19 points from baseline while the mean was a 25-point decrease.

These results suggest that individuals participating in the group may have developed more cognitive flexibility and learned skills to challenge maladaptive cognitions. Additionally, CBT should promote more accurate and adaptive thinking, with corresponding reductions in cognitive distortions. The reduction in cognitive distortions is encouraging, particularly considering the relationship thinking errors and virtually all manner of psychopathology, from clinical syndromes to personality disorders (Rosenfield, 2004). Thus, it is possible that reductions in cognitive distortions provided more general salubrious effects, beyond what was measured in this study. It should be noted that most participants reportedly found the cognitive restructuring component of treatment to be the least intuitive component of treatment; nonetheless, benefitted directly from such interventions. That said, it is difficult to explain why three individuals reported decreases in cognitive distortions, suggesting more healthy and adaptive perceptions, yet still scored higher on the measure of depression.

One hypothesis to explain the increase for some on scores of depression is the social desirability bias, especially given the way participants were interviewed face-to-face by research assistants. Face-to-face interviews can lead to potential influences such as social desirability, yes-saying, limited disclosure of sensitive information (Bowling, 2005). In other words, it is possible that increases in three participants' BDI-II scores were due to under representations of actual levels of depression at pre-test. Consequently, after rapport was built throughout the treatment, it is plausible that posttest BDI-II scores were more accurate representations of the participants' levels of depression at that time than were pre-test scores, at least for some individuals. This is validated by qualitative data gathered during this study when a participant discussed reservations about disclosing feelings of sadness related to vision loss. It is also supported in the literature, particularly in older individuals, as general under reporting of depressive symptoms, a hesitancy to discuss issues like low-mood, and a tendency to attribute feelings of sadness to normal aging (Balsamo, Cataldi, Carlucci, Padulo, & Fairfield, 2018).

It was hypothesized that there would be improvements in problem-solving ability and acceptance to manage distress and challenges associated with decreased visual acuity. Problem-solving and acceptance were operationally defined by scores on the VIS-OPS and the AAQ-II respectively. Two of the eight participants in the study reported improvement in level of acceptance while four individuals showed a decreased level of acceptance. One individual showed no change from baseline. While half of all members did report a decrease in acceptance, the increases were slight with the average being a change of two points. This lack of acceptance in the majority of participants is an interesting finding and may indicate that individuals with life altering disabilities may benefit from CBT, as measured by reductions in depression and cognitive distortions, while still preferring to "fight" rather than accept their new limitations, at least as measured by the AAQ. It is possible that this lack of acceptance may be adaptive for this population.

The result from the VIS-OPS were less positive. Only two members of eight reported broad-based increases on problem-solving skills while the remaining six participants reported decreases in at least three or more domains. One member reported increases in all domains while another reported increases in three domains and no change in another. One member reported a one-point increase in one domain.

The results from the VIS-OPS are challenging to interpret. On a measure of selective primary control (investment of effort or time), one participant reported an increase in the utilization of these strategies. On assessing use of cognitions to improve motivation, two participants of eight reported increases. When assessed on the utilization of technical or human based outside resources, two participants reported an increase in utilization of these strategies. Lastly, on an assessment measuring participants’ ability to disengage from unattainable goals, three participants reported an increase in utilization of this strategy.

Given the participants of this group were already receiving programming from the non-profit organization, much of which focused on adaptive techniques (i.e. use of an iPhone or strategies to improve white cane use), the small changes are not surprising. Indeed, many of the participants already endorsed utilization of many of these strategies during the pre-test phase of data gathering, suggesting this particular group of people may have already possessed requisite problem-solving skills related to the use of external resources and aids. It is important to note this group of individuals was already connected to the non-profit organization, suggesting at least a basic appreciation of outside help. Simply attending groups and participating in life-skills classes points to an already intact problem-solving approach. Taken in the context of this group, these scores seem logical. A less connected group of individuals may have reported lower baseline scores and subsequent sharper increases.

It was hypothesized there would be improvements in perceived quality of life following the PST group. Quality of life was operationalized as scores on the WHO-QOL BREF. The most interesting finding from the WHO-QOL BREF was the improvement of nearly all participants on the psychological domain of the quality of life measure. Seven of eight participants reported improvement in psychological functioning. This finding suggests members who attended the group reported increased satisfaction with their emotional well-being. Additionally, six of the eight participants also reported improvement in the quality of their social interactions. The seeming lack of improvement with regard to overall quality of life may be attributable to the population being generally older and who were concurrently managing many different health conditions in addition to low-vision.

In addition to encouraging quantitative findings, other compelling evidence of the efficacy of this treatment is found in the endorsements of those participating in the study. Group members routinely offered praise of the group and suggested it would be valuable if it were continued beyond the end of the six-week treatment, commenting that many of the principles discussed were very useful but complicated and challenging to understand in just a two-hour session. Many of the group participants suggested that additional and ongoing practice would further solidify the lessons and skills offered in the sessions and allow for ample practice time to hone new skills to handle their challenging worlds. They also suggested that expanding the program would allow others to benefit beyond this small group.

Members also expressed disappointment in the relative lack of other treatment options for individuals with low-vision who live with symptoms of depression, anxiety, or experience diminished quality of life. Given the ever-increasing number of individuals living with low-vision and blindness, the absence of evidenced based treatment interventions to alleviate symptoms of anxiety and depression is an opportunity for organizations to expand their programming to incorporate emotional wellness into class and group offerings.

The difficulties members of the group had accessing mental health care in addition to not always feeling understood by their primary care physicians may be suggestive of a lack of knowledge of available resources within the healthcare system. These limited experiences may also feed distorted beliefs about accessibility of options. In addition to causing frustration to those living with visual impairment and causing a possible rupture in the patient-provider relationship, this may also delay much needed interventions early in the vision loss process. Psychoeducation for providers, as well as interventions targeting problem-solving and acceptance at the onset of vision loss may reduce instances of depression and improve overall health outcomes. Given primary care physicians and ophthalmologists are often the first to know of a patient's potential vision problems, it is necessary these providers understand the full range of possible treatments, up to and including referral resources and behavioral health and motivational interventions.

Additionally, this study demonstrated a creative and flexible implementation of an empirically supported treatment protocol adapted to fit the needs of a dynamic and diverse population, predominantly comprised of minority group members. This study showcased how a treatment protocol can be delivered in a non-traditional location and highlighted opportunities for similar interventions to be offered at primary care or ophthalmology offices, non-profit organizations, and other community facilities like schools, libraries, or places of worship. This group intervention demonstrated that an efficacious treatment can be delivered at the least burdensome location for individuals attending the sessions; the facility where they already receive supportive services. This is an especially salient point given the inherent difficulties of transportation and mobility for individuals with low-vision and blindness. In fact, a number of participants suggested they would have been unable to attend groups had they occurred at a separate location due to their limited transportation funds, conflicts with other scheduled appointments, as well as the anxiety and practical obstacles to finding a new location.

While these transportation difficulties were a hindrance for individuals attending the PST group, it was also evidence of a systemic challenge faced by individuals with disabilities reliant upon public and disability-specific transportation. However, it should be noted that irregular attendance was also caused by practical obstacles. For instance, some individuals reported leaving their homes as early at 6:45 AM to ensure being on-time for the 10:00 AM group. Furthermore, the same individuals were unable to obtain public transportation rides home earlier that 1:00 PM, sometimes resulting in them arriving home well after 4:00 pm. Taken together, some individuals allotted eight total hours to attend sessions with participation in the group taking only one quarter of that time. Given this, it is a wonder the attendance rate was not far lower than observed in this study.

Regardless of where the intervention is offered, the dependability of the group facilitator is crucial to effectively implement a group treatment for individuals reliant upon public transportation or rides from caregivers, especially considering the fees associated with getting to and from the treatment location. Due to the need of individuals to plan rides to the physical location of the group sometimes a week in advance, it is imperative a schedule be established well before beginning the treatment and strictly adhered to by the facilitator and participating organization. There will likely be a number of interfering factors preventing individuals from attending each group session including doctor’s appointments, illness, traffic, transportation, and many other life circumstances. All of these aforementioned issues prevented regular attendance by the group members. That said, changes to the time, date, and room location should be avoided if at all possible to prevent confusion and disillusionment with the group.

Facilitators are encouraged to establish foundational expectations related to dependability during the first group. While it is standard to explain confidentiality and group norms, it is recommended that extra attention be given to what the group members can expect from the facilitator; namely punctuality and reliability. During the first session, it is recommended attendees be given assurance that the group will be occurring as scheduled can be relied upon as a trusted fact, irrespective of extraneous factors. It is imperative attendees perceive the established group schedule as an unwavering and immutable certainty, as ambiguity or last-minute cancellations can undermine the credibility of the facilitator and ultimately the treatment and are far too common in their interactions with providers. In addition to reducing anxiety among the group members, whose activities are often dependent on less predictable resources, such as unpredictable para-transit drivers, this should also instill hope and faith with such a demonstrable verbal commitment on the part of the group therapy leader. The facilitator communicating explicit, self-imposed high expectations on their own conduct may engender reciprocal commitment on the part of participants, which can result in increased effort; participants may be more diligent in attempting to overcome the very real potential obstacles to attending each group session and in participating within the group itself (Yalom & Leszcz, 2005).

Additionally, it is advised clinicians implementing a similar intervention consider possible scheduling conflicts with other activities at the treatment location to avoid scheduling the group sessions at times that coincide with other helpful or enjoyable groups. Understanding the schedule of the organization hosting the treatment groups will highlight certain patterns and promote attendance. Groups operated by the facility like technology support classes, recreational activities like bingo, or travel/cane training may interfere with group attendance. However, these groups also present opportunities as they are days where more individuals may be at the center.

For example, the PST group in this study occurred on the same day as a smart-phone support group. Many individuals simply stayed on the same floor of the building and awaited the beginning of the PST group to begin after the smart-phone group had ended. See table 7 for a list of guidelines for implementing group interventions for individuals with visual impairment.

Table 7

Group Implementation Recommendations for Visual Impairment

Tenet	Purpose
1. Secure buy-in from partnering organization and communicate often with a single identified point of contact.	Establish goals and promote cooperation. Quickly address issues that arise and discuss culture of the organization.
2. Identify a time and day that optimizes attendance and mitigates barriers. Be considerate of transportation issues.	Many organizations have concurrent skills groups or recreational activities. Early morning or late afternoon group times may present attendance difficulties.
3. Establish a time, day of the week, and a familiar room to the participants that can be consistent; consider holidays, vacations, and closure of the center.	Extended gaps in treatment will make retention of discussed information more difficult. Scheduling a group with an off-day for a holiday may dissuade attendees.
4. Identify a back-up facilitator in the event of an emergency.	A backup therapist familiar with the treatment and one who has preferably met the group, will ensure the group happens as scheduled.
5. Instill hope and the importance of regular attendance.	Belief the group will happen and it can work can promote attendance and increase participation.
6. Complete reminder phone calls at least three days before the next scheduled group.	Individuals relying on public transportation often must request rides days in advance to coordinate pick-up and drop-off times.
7. Be flexible and accommodating.	Challenges will arise and it is important for facilitators to model problem-solving principles despite difficulties in the execution of the group.

The most profound benefit to participants of this project is likely the normalization of the discussion surrounding issues of depression, anxiety, and other behavioral health related topics in a population where cognitive and emotional avoidance seem to predominate. It seems that this group treatment, designed to explicitly assist attendees reduce feelings of emotional distress resulting from losing vision, promoted an openness and an overall willingness to have difficult conversations about the emotional toll of declining vision. Additionally, bringing in an outside facilitator can be advantageous for both the group attendees and the home organization. An outside facilitator, as opposed to a regular staff member, can help to reduce instances of dual relationships, thus preserving the roles of program staff and can prevent group sessions from devolving into off-topic discussions (i.e. staff issues). Furthermore, whereas group members may be initially hesitant to share personal details, an outside facilitator can promote more candor and honesty within the group given the facilitator’s sole role to process emotional topics related to vision loss.

Limitations.

These results should be considered within the context of several limitations, Specifically, the study had a small sample size, self-selection into the group, and intermittent attendance by those participating. Additionally, control groups were not employed, making between group comparisons impossible. Although efforts were made to ensure both reliability and validity, there are a number of confounding variables to be considered related both to the study and the sight-impaired population, more broadly. Each of the following considerations may have affected the overall outcome of the study, which necessitates the need for a larger sample size and with the treatment being repeated across different populations. Homogeneity of the sample, intermittent attendance of participants due to transportation difficulties, limited participant ability to take notes during the session, etiology of visual impairment, duration of visual impairment, attrition, and social desirability on the part of participants all must be considered when interpreting the results of this study and when embarking upon future research endeavors.

The vast majority of participants in this study were female (80%) and identified as African American (60%). Many factors contributed to the sample in this study being more homogenous than that of the general population of the United States, including the make-up of the city where the study was completed and the demographics of those utilizing the non-profit service. Therefore, it is possible that these results may not generalize.

Less than regular attendance to the group also represented a limitation of the study. Efforts were made to ensure participants had a clear understanding of the time, dates, and room where the group was scheduled. Participants were told about the group by the organization staff and the scheduled times were reiterated during the first group. Additionally, individuals were given a reminder call by the group facilitator at least two days before the group. However, because all individuals attending the group relied on public transportation or para-transit, attendance was sometimes predicated on the availability of a driver, traffic, or the precedence of patrons with other important appointments, such as medical visits.

Another limitation to be addressed by future researchers must be related to the participants' challenges with regard to taking notes and utilizing handouts to reinforce principles included in PST. Handouts are integral to the execution of PST and while attempts were made to have participants visualize certain aspects of the treatment, it was impossible for all participants to take notes or review handouts. This may have reduced the overall efficacy of the treatment.

The etiology and duration of visual impairment are both items future research should consider as those with longer-term vision loss can have different experiences, expectations, and existing skills when compared with individuals who have recently lost their sight. This study attempted to control for individuals living with blindness for a time greater than five years. However, the exact day, month, or year is often difficult to identify due to the progressive worsening of visual acuity over time. For example, many eye disorders like AMD have slow and chronic progressions. As a result, some individuals in this study have been identified as visually impaired for many years, however, only recently lost the ability to read without a large magnifier, thus meeting the criterion of worsening vision over the last five years. These individuals have had very different experiences than individuals who were previously fully sighted and lost their vision due to an accident or a more acute illness. While identifying acute versus chronic vision problems may be helpful, it is a gross oversimplification of the experiences those with vision loss; each individual has a unique experience, disease or accident story, and different aspects of their life that have changed profoundly as a result of the vision loss. That said, a group of individuals all with acute onset visual impairment may respond differently to this treatment than a group of individuals who have experienced the slow and progressive visual decline of AMD or diabetic retinopathy.

Another limitation to this study is the attrition and inability to acquire three-month post treatment follow-up data for all group members. This fact, coupled with the small sample size previously discussed, makes extrapolation of results difficult. Participants provided many reasons for not participating in follow-up data gathering including being on trips and vacations during the posttest phase, conflicting medical appointments, and shifting days of availability to meet with research assistants. Future researchers should consider alternative ways to collect data to improve the efficiency and ease with which participants can complete posttest surveys and questionnaires. An option for overcoming the barrier of attrition is to complete posttest data questionnaires over the phone to reduce the number of trips an individual must make to the testing site. While this presents the possibility of some ethical dilemmas, for example, how to address a participant if they report feeling suicidal over the phone, it may be helpful in ensuring the acquisition of all relevant data.

Social desirability and self-selection is also a significant limitation of this study. Individuals chose to participate in the group with the expectation the topics discussed would be centered on adaptation to visual impairment and strategies to manage feelings of sadness and depression. As a result, it is likely attendees of the group possessed optimism and hope. It can be assumed individuals volunteered because they had interest in overcoming the challenges of low-vision. Conversely, individuals with the highest levels of depression, as measured by the BDI-II, attended the fewest number of sessions; people who needed the treatment the most self-selected out of the group. Furthermore, because of the nature of visual impairment and for methodological fidelity, research assistants read the survey questions to the group attendees. While this served the purpose of ensuring each participant was able to answer the questions accurately, it added the potential for individuals to respond in a way to appear more favorable to those who recorded their answers. In fact, this has been addressed in the literature (Tolman, Hill, Kleinschmidt & Gregg, 2005), and was also evident in the qualitative analysis. While self-selection will be difficult to control for in future studies, social desirability bias can be addressed in a number of novel ways. A possible solution is survey questions can be recorded and played through headphones and responses from the participants be recorded. Another possible way to address this limitation is to read the questions to participants over the telephone to remove the need for study participants to answer questions to a research assistant while in the same room. Additionally, a physical barrier between the participant and the research assistant may also reduce social desirability bias in responses.

Recommendations for Future Research.

Given the ever-growing population of individuals living with visual impairment and the adjustment challenges many of those individuals face, it is recommended continued research be conducted in the area of cognitive distortions, acceptance, and quality of life as they relate to blindness and visual impairment. These endeavors will expand on the current body of research and promote the increased accessibility of evidenced based-treatments.

Future researchers should consider the social desirability bias, evidenced by self-report and likely artificially low BDI-II, high QOL, high acceptance, and high problem-solving scores. Researchers should develop ways to reduce these biases in hopes of acquiring more accurate data.

Researchers should also consider implementation challenges in rural communities as well as different metropolitan areas. Heterogeneity of the population sample should also more closely mirroring that of the population at large is also recommended. Additionally, researchers are advised to explore different venues to facilitate the group and consider primary care offices, ophthalmology offices, or other community-based centers.

Because of the limited success of the treatment in reducing symptoms of depression, improving levels of acceptance, enhanced usage of problem-solving skills, and overall improvement in quality of life, it is recommended a dismantling study be completed to better understand more fully the relationship between these variables. Additional research addressing the role of cognitive distortions is also recommended given the reductions observed in this study.

Conclusion.

A flexible, inventive, and accommodating evidence-based approach to working with individuals with visual impairment and blindness is imperative due to the abundance of dramatic challenges faced by this population, including travel difficulties to and from group meetings, social desirability interfering with early face-to-face assessment, and obstacles to between session review, for example the inability to review notes. Despite these limitations potentially affecting reliability and validity, this study represented a realistic proof of concept implementation of a treatment to reduce depression, cognitive distortions and improve problem-solving abilities for individuals with low-vision and blindness. While reductions in depression were not significant, changes in the presence of cognitive distortions suggested increased cognitive flexibility and subjective sense of accomplishment and well-being. The resultant cognitive flexibility may foreshadow more positive behavioral health outcomes in the future.

Lastly, it may appear those living with visual impairment can simply easily be grouped by the defining feature of low-vision; the truth is far more complex. When implementing a treatment for a diverse and varied group, such as those living with low-vision, the limitations evident in this study are unavoidable and must be addressed to improve not only attendance, but also understanding and retention of in-session gains. A flexible, inventive, and accommodating approach to working with individuals with visual impairment and blindness is imperative due to the abundance of challenges.

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